LEIDEN ASIA CENTRE
Partners in Research and Knowledge

Towards Sustainable Europe-China Collaboration in Higher Education in Research

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Executive summary

Europe and China are indispensable partners in higher education and research (HE&R). As a result of strategic policies and strong investments in HE&R, China has become an increasingly powerful and advanced player in this field and the two sides have engaged in numerous successful research projects. This joint collaboration has led to major achievements in science and it is to be expected that Europe and China will continue to invest in expanding and deepening collaboration in HE&R. However, this collaboration also presents various challenges and concerns. In recent years these concerns have become more pronounced and the political climate in which HE&R cooperation with China takes place has become increasingly complicated. As a result, European policymakers at HE&R institutions and government organizations increasingly face the question of how to develop safe cooperation, as well as how to best minimize strategic, security, and ethical risks.

This report argues that in order to effectively address these challenges, European HE&R stakeholders need to develop and implement approaches aimed at making collaboration with China more sustainable. Doing so is in their own interests. It is in their interests not only regarding their security and the academic freedom of their staff and students, but also in terms of their long-term competitive positions in research and their reputations as institutions. A number of actors have already taken action. Several stakeholders with broad reach have developed guidelines for strengthening knowledge security and safeguarding academic freedom in international collaboration, including collaboration with China. These guidelines can provide inspiration and input to European stakeholders who want to take measures but are hampered by a lack of financial and human resources, and knowledge about China.

This report concludes with a set of recommendations for stakeholders. These highlight that, in addressing the challenges posed by HE&R collaboration with China, European collaborative efforts involving peer HE&R institutes and government organizations are most effective. This way, different stakeholders can pool their resources and knowledge, while joint coordination will broaden support and contribute to mutual trust. In addition to taking protective measures, stakeholders should also develop an approach that allows them to identify the possibilities of expanding sustainable collaboration. A major prerequisite for all endeavours in this area is the expansion and deepening of China expertise.

Table of contents

Introduction

This report seeks to promote and support the development of new approaches to European collaboration with China in higher education and research (HE&R). Policy makers at universities and research institutions as well as at government organizations face enormous challenges with regard to this collaboration: how to expand sound and mutually beneficial cooperation while minimizing strategic, security, and ethical risks? How to deal with a 'strategic competitor' and 'systemic rival', as the EU has labeled China, that is at the same time a higher education and science powerhouse with whom we as Europeans need to collaborate when we want to address global problems? How to avoid paranoia with regard to collaboration with China while expanding awareness and alertness about potential harm to European interests and liberal values? There are no clear-cut answers to these challenges, but this report argues there is room for improving European approaches to HE&R collaboration with China.

This report focuses on solutions and does not elaborate on the benefits and risks of collaboration with China. The latter have been extensively covered in this report's predecessor, the 2018 LeidenAsiaCentre report 'Assessing Europe-China Collaboration in Higher Education and Research'. This 2018 study mapped and analysed European views on the balance between benefits and risks of HE&R cooperation with China. Its conclusion, that European stakeholders appreciate the benefits of cooperation with China but see a need for a more strategic approach to collaboration with China, provides the rationale for this study.

Collaboration between Europe and China in HE&R takes place in an increasingly politicized environment. In the past two years the European Union and many European governments and publics have become more critical about the Chinese government and its policies. Across the Atlantic, the Trump administration is embroiled in a tech and trade conflict with China and pressures Europe to take a side. In New Zealand and particularly in Australia, relations with China have reached an all time low. Meanwhile, in Asia an increasing number of countries are expressing concern about China's growing dominance in the region. The hardening of relations has not come out of thin air but is largely a response to Chinese policies and diplomacy, in particular the country's aggressive Covid-19 diplomacy, as well as its actions with regard to Hong Kong. Polls show that in 2020 unfavorable views of China have soared to more than 71 percent (median) in Europe, 71 percent in the US, and 81 percent in Australia (Silver at al. 2020).

These geo-political tensions have spilled over into the sphere of international HE&R collaboration with China. In Europe and elsewhere, national governments, intelligence organizations and China scholars have drawn attention to the risks of undesirable knowledge and technology transfers, espionage practices, and use of outcomes of collaborative research for military or repressive purposes by Chinese actors. Furthermore, serious worries exist with regard

to the undermining of academic freedom through (self-)censorship practices and direct or indirect Chinese influence efforts at campuses abroad, especially at institutions that rely heavily on Chinese PhD researchers and/or the tuition fees of Chinese students.

At the same time, it is recognized that HE&R collaboration with China, be it in the shape of collaborative research projects or student and staff exchanges, is of vital importance to the international HE&R sector, not least for Europe. Many policy makers and scholars emphasize the need for, and the benefits of, this cooperation for Europe and for advancing science. They also express concern that too much emphasis on the risks of collaboration with China will create an environment that is harmful to the numerous mutually beneficial and successful joint research projects with China and may lead to discrimination of Chinese scholars and researchers.

Current European responses to the challenges raised above are a mixed bag. A growing group of European stakeholders in the HE&R sector realizes the need to address the challenges of international cooperation, whether specifically with China or in general. Among this group some have developed or are developing new policies but many lack the capacity and/or knowledge to do so. Other stakeholders are not aware of, ignore, or refute the risks involved in international cooperation with China.

This report seeks to promote balanced European approaches to collaboration with China in HE&R and to present suggestions for policy makers at HE&R institutions and government organizations to strengthen knowledge security. The approaches discussed encourage stakeholders to engage with Chinese partners in mutually beneficial, safe, and sustainable ways, while keeping away from projects that violate academic integrity or that are not in European interests. There is no 'one size fits all' approach, each university, research institution, government or academic field has to adapt the suggestions presented to its own situation. The report takes China as a case study but acknowledges that risks may be similar for cooperation in HE&R with other countries. Therefore it aims to contribute to developing a broader, country neutral framework for international cooperation in HE&R, albeit with a complementary part for China-specific issues.

The report starts with a brief overview of major developments with regard to HE&R in China. This is followed by an assessment of the state of play with regard to European collaboration with China in HE&R, based on the situation in eight European countries and broader EU policies and programs. After this, the report goes on to discuss what developing an approach to sound and safe international cooperation entails. It then reviews various approaches to managing the risks of international cooperation, before concluding with a set of recommendations. The appendix then provides relevant information on recent global developments and incidents related to collaboration with China in HE&R.

Research questions and methodology

The research for this report has been guided by three main questions:

1. How have European HE&R institutions dealt with relevant challenges and risks over the past two years and how has this affected their cooperation with Chinese partners?
2. What have been the recent relevant developments in China's HE&R in terms of strategy, policies, and the academic climate?
3. How can HE&R institutions strengthen knowledge security and academic integrity in international cooperation and what is the role of national governments in this?

These questions are raised from a European perspective and the answers are geared towards European HE&R institutions. The aim is to help these institutions deal with challenges and risks of international cooperation such as those posed by collaboration with China. Ultimately, we hope that this report, like its 2018 predecessor, will contribute to sound and safe HE&R cooperation between Europe and China, enabling such cooperation to continue to develop and prosper.

The research carried out for this report has adopted a qualitative approach. The answers given to the three main questions have been primarily based on desk research and complemented by interviews and conversations with relevant actors from eight European countries: Belgium, Czech Republic, France, Germany, Italy, Netherlands, Sweden, UK. All interviews were conducted online or by telephone.

We selected these eight countries for close study based on their geographic spread across Europe and their different levels of engagement and experiences of collaboration with China. They were also chosen based on our access to information. While this report is based on a selection of countries and so only provides a snapshot of the situation in these countries, we are confident that our findings contribute to our understanding of the more general state of play of collaboration in HE&R between Europe and China. In this report, 'Europe' refers to the aggregate of countries that comprise the European continent, as represented by the above-mentioned countries. Meanwhile, the 'EU' refers to the European Union.

The desk research carried out for this report involved the analysis of Chinese and European strategy and policy documents in Chinese, English, German and Dutch, academic studies, reports, and other documents by think-tanks, scholars, and government institutions from China, Europe, the US, and Australia. The desk research was complemented by 32 in-depth or background interviews with European scholars and policy officers at HE&R institutions or funding agencies. We are very grateful for the insights and experiences they generously shared with us. Due to the limitations placed on travelling and meeting that have occurred as a result of Covid-19, all the interviews were carried out online. Drafts of this report were read by two reviewers. The recommendations were discussed with Dutch stakeholders from the HE&R sector as well as the government, both individually and in two group sessions, including a total of 33 people. We

have used their valuable feedback to strengthen relevant sections of the report. Finally, we would like to thank Lucrezia Poggetti, Helena Legarda, and Ivana Karásková for their input into this study. We would also like to thank David Pho for his overall support and for sharing his in-depth insight and experience with us.

Chapter I. Developments in China's Higher Education and Research

Introduction

For the Chinese government, education, and scientific research are top political priorities. They are regarded as important forces in the implementation of the country's innovation-driven development (MoE 2019, March 15). The Chinese government also has great ambitions in this regard. By 2035, China aims to be one of the most powerful countries in education in terms of learning, human resources, and talent cultivation (Central Committee 2019). Then by 2049, China should be a world leading country in science and technology (S&T) and innovation (Xinhua 2016). These goals are not just slogans, but are supported by numerous strategic policies as well as by ample financial investments.

China's policies on higher education (HE) focus on improving the quality of universities and the courses they offer and talent recruitment (Central Committee 2019). They also focus on strengthening vocational higher education and on enhancing China's international influence on education around the world. The country's research plans are built around the strategic areas identified in the 13th Five-Year Plan (NDRC 2016) and Made in China 2025, the country's state-led industrial policy aimed at boosting the development of hi-tech industries and high-end production. (China's State Council 2015). These include the hi-tech areas of next-generation information technology (IT), new energy vehicles, robotics, space technology and quantum computing. Funding of HE and research (HE&R) is generous. In each of the past eight years, China has spent over 4 percent of its GDP on education. Its investment in research is also rising year by year. In 2018 China spent 2.1 percent of GDP on R&D, which was less than Germany (3.1 percent), the US (2.8 percent), or the Netherlands (2.2 percent), but more than most European countries, including the UK (1.7 percent) (OECD 2020). In absolute terms China's 2018 investment in R&D amounted to approximately €242 billion, which was second only to that of the US. This combination of HE&R policy strategies and funding has led to significant progress in the quantity and quality of China's HE&R institutions as well as to big strides in scientific research (see boxes 1 and 2).

The Chinese government's recent policy documents reveal clear trends in the development of HE&R in China. This chapter discusses these trends. It looks at five broad themes: the expansion and strengthening of HE&R in China; the alignment of HE&R with China's national development strategies; the alignment of HE&R with the policies and ideology of the Chinese Communist Party (CCP); the acceleration of the internationalization of HE&R in China; and the impacts that the Covid-19 virus has had on HE&R. The chapter ends with a look ahead at the upcoming '14th Five-Year Plan (2021-25)' and the '2021-2035 National Medium- and Long-term Science and Technology Development Plan'.

The expansion and strengthening of HE&R in China

China's rise in HE&R over the past twenty years has been impressive. Its gradual advance in this field has not only been reflected by its position in global rankings (see boxes 1 & 2). It has also been illustrated by

recent achievements such as the landing of China's lunar probe Chang'e on the far side of the moon in January 2020 and the transmission of a quantum-encrypted message from a quantum communication satellite to a ground station (Broad 2020). There has also been the international recognition of the Chinese Ministry of Education's accreditation of medical education programs, something which enables graduates from the accredited medical schools to be accepted in the global health sector (Xinhua 2020, June 24). These developments help to make the Chinese authorities positive in outlook and confident about the course of their HE&R policies. According to a report from China's Ministry of Education, China's HE 'has entered the stage of balanced quantitative and qualitative growth' (MoE, 2020, July 2). The report states that China's HE has made progress in three important areas: meeting international standards in undergraduate-level education, building capacity for talent training, and improving moral education. The latter refers to the Chinese government's efforts to cultivate 'ideals and faith, core socialist values, China's fine traditional culture and mental health' (Xinhua 2019, July 8). This is work that is overseen by the Department of Moral Education of China's Ministry of Education.

China's rise in HE&R: university rankings

China's top universities have risen in the global university rankings

The number of Chinese universities in the top 100 of the 'Times Higher Education 2021 University World Ranking' was six, double the number in the previous 2020 list. This list gives world universities a ranking based on 13 indicators, including their reputation among peers and the number of citations their research has received. The highest listed Chinese university is Tsinghua University, which is ranked 20th on the list (THE, 2020).

In the 2020 CWTS Leiden Ranking, which looks at scientific performance based on bibliometric data, Chinese universities outnumbered US universities for the first time: Among the 1176 universities listed, there are 204 Chinese universities, including six from Hong Kong and one from Macau, compared with 198 US universities (CWTS 2020).

In the 2020 QS ranking, which is based on reputation, citation and internationalization, China has four universities in the top-50. Tsinghua is in 15th place, followed by Peking University (23rd place), Fudan University (34th place), and Shanghai Jiaotong University (47th place) (QS 2020).

Box 1. China's rise in HE&R: university rankings

However, at the same time the Chinese government also realizes that it still has a long way to go in overcoming the shortcomings of its HE&R system. Chinese researchers and policymakers mention the promotion of short-term thinking; bureaucratic or governmental intervention; a weak evaluation system; and over-reliance on human relations (Han and Appelbaum 2018). They also point towards inefficient funding and lack of creativity, something that will be discussed in more detail below. The Chinese government is dedicated to addressing and overcoming the shortcomings of its HE&R system. It has launched a seemingly endless stream of policy plans and regulations, a selection of which will be discussed in the following sections of this report. These policies are implemented by China's State Council and the two ministries that play a major role in HE&R: the Ministry of Education and China's Ministry of Science and Technology.

The need for talents: improving undergraduate education

In the domain of HE, most effort is dedicated to improving the quality of higher education institutions (HEIs) and the programs they offer. A good example is the Talent Training Program 2.0. This was launched in April 2019 and seeks to give a major push to the improvement of undergraduate education. The program is a government-wide, coordinated effort to devote financial and human resources to a three-year plan that is also referred to as the Double Ten Thousand Plan and that aims to achieve two major goals by 2021. Firstly, it aims to construct approximately 10,000 first-class national-level and 10,000 first class provincial-level undergraduate degree-granting institutions, as well as 260 high-quality training centres for outstanding students. Of the latter, 60 centres are to be dedicated to social science and 200 to natural science and medicine. Secondly, it seeks to establish 10,000 national-level and 10,000 provincial-level undergraduate courses of 'top quality' in terms of integrating 'cutting-edge technological development' and improving 'moral character' (MoE 2019, April 30; MoE 2019, May 2; and Sharma 2019b; see also Tatlow et.al. 2020a). These schemes are complemented by guidelines for the development of 'Internet Plus Education, the reform of curriculum development, and the evaluation of educational programs, including punitive measures such as the removal of poor-performing courses and of professors who don't teach undergraduates for three years (Yin 2019).

China's rise in HE&R: research output

In the last decade, China's research output has grown almost twice as fast as the world's annual average. In 2018, China became the second largest producer of scientific papers. While papers from the US and Europe still have the most impact and are more highly cited, the number of highimpact Chinese papers is rapidly increasing (NSB 2020 & CWTS 2020).

According to the Nature Index 2020, which is based on publication output in 82 natural science journals, China ranks second in terms of high performing natural-sciences research output. It has been the fastest riser since 2015. It is steadily closing the gap with the number one ranked country, the US (Nature 2020).

The Chinese Academy of Sciences was the world's top institution in 2019, ranking first in the areas of chemistry, earth and environmental sciences, and physical sciences (Nature 2020).

Box 2. China's rise in HE&R: research output

Improving graduate and post-graduate education and research

After years of focusing on undergraduate education, in July 2020 President Xi called for more attention to be given to graduate and postgraduate education. These play important roles in achieving breakthroughs in basic research and in the cultivation of the innovative talents that China needs (MoE 2020, July 31). It was stated that the improvements to graduate and postgraduate education should be achieved through the continuous reform of China's innovative research environment, more attention to fundamental science and interdisciplinary research, as well as the construction of more national laboratories and science parks. While making progress in many areas of research, China still has much to gain from more effectively spending its funding for science. At present, it has been reported that funding is spent in

fragmented and inflexible ways, with insufficient investment allocated to basic research (Kennedy 2019). Furthermore, Chinese scientists complain that the pressure to show results encourages academic misconduct (Kennedy 2019). Another issue that is regularly brought up in China, as it is in other places, is that while scholars may excel in terms of knowledge, they lack creativity. For example, Qian Qiyi, the former dean of the economics and management school at Tsinghua University, has noted that the way in which Chinese schools emphasize increasing students' knowledge comes at the cost of creating an environment that stimulates the development of creativity by protecting and encouraging students' curiosity and imagination (Qian 2020).

In addition to addressing specific issues, the Chinese government is also working on a restructuring of China's S&T governance system. In 2018, the role of China's Ministry of Science and Technology (MOST) was strengthened by a decision to bring under its umbrella important players such as the National Natural Science Foundation of China (NSFC), which is China's research funding agency, and the State Administration of Foreign Experts Affairs, as well as other organizations (Sharma 2018b). In addition, the Chinese government transformed its 'Leading Group for Science, Technology and Education' into a new body that is no longer in charge of education but specifically oversees the country's sci-tech sector. This new body, called the National Science and Technology Leading Group, is headed by the Chinese Premier Li Keqiang. Both steps will allow for a stronger alignment of research with the government's policies (Hu 2018).

Alongside these initiatives, the Chinese government is also carrying out the Double First Class University Plan (2016-2020), which is aimed at developing world-class universities and world-class academic disciplines. In the summer of 2020, the Ministry of Education announced that there will be an evaluation of the effectiveness of the plan, stating that the evaluation will provide an important basis for decisions on the next round of resource allocation to top universities (Sina 2020).

Reforming research evaluation and academic publishing culture

In early 2020, the Ministry of Education and the Ministry of Science and Technology released a set of guidelines aimed at reforming the evaluation of research for academic promotions and research funding. The new evaluation system no longer only relies on indicators based on international Web of Science publications (previously Science Citation Index). It now also includes evaluation of different types of scientific research work. It requires, for example, that one third of all scientific articles used to evaluate a person's research are published in domestic Chinese journals (Xinhua, 2020, February 24). The new guidelines address various problems in China's academic publishing system. These include 'international citation worship' at the expense of attention to the quality and societal value of research. They also include breaches of academic integrity resulting from the pressure to publish in top international journals (Zhang and Sivertsen 2020, Tao 2020, May 11).

However, there are also other considerations. In 2018, President Xi announced the goal of moving away from the publication of research internationally. He said that academic standards in HEIs should not be primarily guided by Western ideas and norms but should instead be based on China's own academic standards and norms (Sharma 2020b). This shift away from evaluation based on international publications could lead to a reduction in the number of international English language publications of scientific work coming from China (Tao 2020, February 27). It could also be a first step towards building an alternative Chinese (and eventually global) system for the evaluation of scientific work.

Improving teaching and smart education

Good teaching is key to good education and the Chinese government also invests considerably in upgrading teaching. In 2018, the Ministry of Education established a Steering Committee for Guidance in Teaching in Higher Education Institutions 2018-2022. The 5500 members of the committee have been tasked with supporting the implementation of government policies. In particular, they have been given the task of handling 'matters of urgency' such as developing national standards for teaching quality, updating curricula, strengthening teacher accountability, and 'creating a sober learning environment for students' (MoE 2018, November 4). According to the Ministry of Education, some persistently problematic areas with teaching include lack of innovation of pedagogical models, loose student supervision leading to mediocre levels of academic challenge and incidents of academic misconduct, and the lack of an effective, long-term mechanism for teachers' moral education (MoE 2020, July 2). Moral behaviour rules are laid down in a Code of Conduct for Teachers (2018) which puts forward ten points for college and university teachers, including the strict prohibition of plagiarism (Xinhua 2018, November 16).

Teaching should also be improved by a better use of information technology, including artificial intelligence (AI). The 'Education Informatization 2.0 Action Plan' (2018) provides measures to stimulate the use of smart teaching and learning applications and smart campus construction. Furthermore, the plan aims for an upgrade of the IT literacy of teachers and students and for bold steps such as creating a 'school credit bank' system using innovative blockchain technologies (MoE 2018, April 18). More recently, the above plan was complemented by the 'AI Innovation Action Plan in Institutions of Higher Learning', which envisages that new developments for AI-empowered education in China will result in more cross-disciplinary academic research and educational standards that prioritize equality and quality. The plan also highlights the need for educational governance systems to address moral and data security risks (MoE 2019, May 17). Linked to these developments is the Chinese government's investment in the development of online educational resources, including massive open online courses (MOOC) (MoE 2020, July 2). This development was accelerated by the urgent need for distance learning after universities in China had to close down as a result of measures to contain the Covid-19 virus. By the end of 2019, China offered around 15,000 MOOCs (Xinhua 2019, November 2). Many Chinese universities have joined global online education platforms like edX and Coursera.

Improving academic integrity

The Chinese government also attaches much importance to the prevention of academic misconduct and fraud. It has long recognized the problem and has put forward policies and regulations, but compliance remains a bottleneck. In late 2018, academic integrity in China was discredited by an experiment by the Chinese scientist He Jiankui that involved gene-editing in babies, the so-called crispr babies (Xinhua 2018, November 29). This led the Chinese government and research institutions to make a renewed effort to improve awareness of, and adherence to, rules for research ethics. In 2019, He Jiankui and his assistants were arrested and given prison sentences for violating Chinese laws (Sample, 2019). China's National Health Committee then proposed rules stipulating that experiments with gene modification on human cells had to be approved by a special commission (Sharma 2019e). In September 2020, detailed guidelines for safeguarding academic integrity came into effect. These stipulate that misconduct such as deliberate overvaluation of work, the provision of false information when applying for funding, and plagiarism or

fabrication of false research results will be punished. In the same month, the Ministry of Science and Technology announced that it had created an interdepartmental database to record academic misconduct and prevent future offenses (Zhang 2020). Earlier, China's National Development and Reform Commission issued plans for China's Social Credit System to include credits and penalties for behaviour in the field of scientific research (Sharma 2019a).

Changing behaviour related to academic integrity is a long-term process. The same challenges with regard to awareness and compliance are also true for combating plagiarism, which is still a problem in China. Cases highlighted in the Chinese media include the case of a former director of the People's Liberation Army's Institute for Disease Control and Prevention, who plagiarized the work of another PhD student (Zuo 2019). Another case reported was the retraction by internationally renowned academic journal *Nature* of an article by Chinese scholars who allegedly copied 'significant portions of the text and equations' from work by a Hungarian undergraduate student (Walsh 2020). However, the problem is widespread (see e.g. Palla et al. 2020). Here too, strict rules have been set, but they are insufficiently adhered to (Zuo 2019). The government has sought to solve this by strengthening the work of ethics committees at HEIs, improving education on research ethics (D'hooghe et al. 2018), and banning financial rewards for publishing. However, a 'mature unified plan has not been formed yet' (Wang & Yan 2019).

Alignment of HE&R with China's development strategies

The primary task of all Chinese policies on HE&R is to support China's national and international development and rejuvenation strategies. This section discusses the alignment with domestically oriented policies. Alignment with China's foreign policies, as is most prominently visible in the connection between HE&R and the Belt and Road Initiative (BRI), is discussed in the later section of the report about the internationalization of China's HE&R. At the domestic level HE&R policies support comprehensive plans such as Made in China 2025 (MiC 2025) and the recently launched 'dual circulation' strategy. The latter strategy, of which only the contours are known at this stage, seeks to reduce China's global integration (the first circulation) in favour of increasing domestic reliance (the second circulation) (Blanchette and Polk 2020). Both policies focus on finding a balance between internationalization and China's perceived need to increase the country's self-sufficiency, a view that has been strengthened by the ongoing trade and hi-tech war with the US. This aim for self-sufficiency will be an important driver of China's HE&R policies in the years to come.

The alignment of research with Made in China 2025 is reflected by the investment in research across many of the strategic sectors that are prioritized in Made in China 2025, including information technology (IT), green growth and green vehicles, aviation and space exploration, robotics, machinery, transportation equipment, medical equipment and agriculture (see e.g. European Commission 2019). The 'dual circulation' strategy may have inspired the Chinese Communist Party's May 2020 proposal for the development of a 'new nationwide system for key core technologies'. This new system aims to make China independent from foreign equipment, technology, and Intellectual Property Rights (IPR). It states that the market should play an important role in the allocation of resources while the government should focus on creating effective connections between policies concerning science, technology, the economy, and society (CPS 2020).

China's investment in strategic fields of study is evident in policies as well as figures. The country's 13th Five Year Plan (2016-2020) includes goals to be achieved in strategic scientific fields such as nanotechnology and quantum communication. It also includes targets regarding numbers of scholarly citations. The Double First Class University Plan has a list of disciplines to be developed which places focus on natural sciences, IT, and engineering (Australian Government 2018). There are also various plans that focus on specific sectors. The 2017 Next Generation Artificial Intelligence Development Plan, for instance, addresses the need for China to become an IT powerhouse, to develop AI education at all levels, to strengthen the quality and level of AI science, and to develop an AI-skilled workforce (State Council of China 2017). The Chinese government is expanding AI courses and study programs at universities, building education platforms that use Big Data intelligence, and encouraging an increase in enrolment to AI-related master's and doctoral programs. By May 2018, China had established 32 specialized AI colleges (Yang 2019). Another example of a specific plan that has been made is in the field of agricultural study, an area which is of strategic importance for China's food security. The HEI Science and Technology Innovation Action Plan for Rural Rejuvenation (2018-2022*)* seeks to encourage HEIs to devote more effort to research and education related to agriculture and to help tackle productivity constraints and enable green growth (MoE 2019, June 14).

China is also investing heavily in the development of the so-called STEM subjects: Science, Technology, Engineering, and Mathematics. In China these fields already draw a higher percentage of students than they do in other countries, but they still do not attract a sufficient number of students to address China's needs. In 2017, the National Institute of Education Sciences published a white paper on China STEM Education (2017) in which the gap between supply and demand was addressed (Zheng 2019). In January 2020, the Chinese government launched the Strong Base Plan, which focuses on 'preparing students for areas including high-end chips and software, intelligence in science and technology, new materials, advanced production and state security' (Zuo 2020). Another plan aims for 700 'key state laboratories' for fundamental research to be established by the end of 2020. At the end of 2018, the Chinese government had 501 key state labs operating (Feng 2020).

Another area of alignment concerns military-civil fusion. This has been strongly promoted by President Xi and in policy documents such as the '13th Five Year Plan'. Military-civil fusion refers to the interlinking of military and civilian S&T resources and the coordination of research and innovation so that it advances both economic and military development (see e.g. Kania and Wood 2020). It includes developments such as the increasing recruitment by the Chinese military and defence organizations of graduates and scholars of civilian HE&R institutions for conducting scientific research in areas relevant to the military (Tay 2020), growing interlinkage of academic research and military applications, and the sponsoring of Chinese military researchers to study at universities around the globe (Joske 2018). As they often do in research areas that involve dual use technologies, these developments in China's pursuit of military-civil fusion carry security and ethical risks for foreign HEIs (Joske 2019).

Vocational education and the use of knowledge

The priority that the Chinese government gives to the development of vocational education and to the societal impact of knowledge should also be seen in the light of Chinese efforts to make education support national development. The country needs an advanced manufacturing industry that 'must be underpinned by a talented workforce'. In 2019, the government earmarked US$124 million for the

development of demonstration zones to promote innovation and entrepreneurship education (Xinhua 2019, October 11). Chinese universities and colleges are active in promoting innovation and entrepreneurship as part of the curriculum and through extra-curricular programs, often involving companies. In 2020, the MoE reported that HEIs offered nearly 1.5 million different experimental, specialized courses. It also reported that 1210 state-level experiment and practice demonstration centres and 226,000 off-campus practice and internship centres had been established. By the end of 2018, 452 universities and colleges were giving credits for students' innovation and start-up activities (MoE 2020, July 2).

Alignment of HE&R with Communist Party policies and ideology

The Chinese government and the CCP make no secret of the guiding role that they seek to play in HE&R (MoE 2019, March 15). According to President Xi, the direction of the development of China's HE should be the same as that of the country as a whole and adhere to the 'Four For'. This refers to their need to serve four goals: serve the people, serve the CCP in governing the country, serve the consolidation and development of the socialist system with Chinese characteristics, and serve reform, opening up, and socialist modernization (MoE, 2020, July 2). President Xi unceasingly underlines the need for full CCP leadership over all education related initiatives and for ideological and political education in schools. Teachers and students are expected to be familiar with developments in Party ideology. Scholars and other staff members have to attend regular study meetings on Party policies and many elite universities have established Centres for Xi Jinping Thought (Denyer 2017), demonstrating their allegiance to the CCP. President Xi also regularly emphasizes that schools must be confident in developing education rooted in China and in pursuing a world-class modern education system with Chinese characteristics, or one that is based on the Chinese moral values discussed above (MoE 2018, September 26 and MoE 2020, January 10).

Infringements on academic freedom in China

The increasing control over HE&R exercised by the CCP and the government and the growing role of ideology in classrooms under president Xi is negatively affecting academic freedom in China. The room for open debate on political issues in class has been diminished, access to the Internet and to international academic publications has been limited, and censorship has increased. Chinese university professors and students who express ideas or carry out initiatives that diverge from official views and policies risk negative consequences, ranging from suspension and intimidation by superiors or authorities, to arrest and legal punishments. Students and staff are not only monitored by the university's Communist Party Committee but also by students as the following three examples illustrate. In March 2019, Tsinghua University Professor Xu Zhangrun was suspended from teaching after he published an essay in which he criticized the abolition of the two-term limit of China's president (Shepherd 2019). Also in 2019, Tang Yun, a professor at Chongqing Normal University was demoted for making critical remarks and 'causing damage to China's reputation' (Hernandez 2019). A year earlier in 2018, You Shengdong, who had worked for a long time as an economics professor at Xiamen University, was fired for criticizing one of President Xi's slogans. Infringement on academic freedom is even stronger in the Xinjiang Uyghur Autonomous Region, where heightened surveillance takes place and a growing group of minority scholars and students have

been intimidated and/or moved to 're-education camps' (Scholars at Risk 2019; Amnesty International 2019; Sharma 2019h).

Publications are also increasingly censored. Academic organizations and publishers in China are bound by rules about what can and cannot be published. These rules are set by the Central Propaganda Department of the CCP (Brady 2016) but are executed by a wide range of government organizations (US CEC on China n.d.). All publications have to be checked by censors before they can be published and textbooks are regularly inspected with the aim of removing unapproved alterations or foreign content and promoting the use of state-approved materials (Shepherd 2018). In case a publication slips through, it can be taken away from the bookstores. This happened, for instance, with a book by the Peking University professor Zhang Qianfan that advocated constitutionalism (China Digital Times 2019).

Foreign academic publishers and individuals are also confronted with censorship. They are regularly put under heavy pressure from Chinese partners to censor publications that are made available in China. This censorship includes the removal of magazine articles or parts of them, the adaptation or removal of text in translation, or the blocking of access to websites or parts of websites. The censorship is not limited to the fields of China studies and political studies. For example, currently Covid-19 research is subject to political control (see the section on Covid-19 below).

In addition to being censored, many scholars, students, and other staff members at universities who work with China or do research on China, censor themselves (Chestnut Greitens and Truex 2018; D'Hooghe and Dekker 2020). This self-censorship not only includes self-imposed restrictions on what is being said but also on the choice of subjects for research. This increasing pressure to avoid studying sensitive topics with regard to China is leading to a lack of international knowledge about these issues. The Chinese government directly or indirectly incites self-censorship: either by offering incentives, such as funding for education and research and access to resources, or through negative means such as the imposition of pressure or threats, exclusion from activities, cessation of funding or projects, or denial of a visa for China (d'Hooghe and Dekker 2020).

The Acceleration of the Internationalization of HE

On the one hand the Chinese government is limiting foreign influence on HE&R in China and reducing Chinese dependence on foreign science, while on the other hand it is continuing to invest in the internationalization of HE&R. It needs international collaboration to address gaps in the capacity and quality of its own HE&R system. In June 2020, the Ministry of Education and seven other ministries jointly published a plan to further open up education (MoE 2020, June 22). The plan presents four sets of goals. The first set of goals aims for the expansion of joint degree programs with global partners, cross-border and overseas joint education programs, and education programs established by Chinese HEIs abroad. These aims should be achieved through the removal of institutional barriers, a better facilitation of incoming and outgoing student and staff mobility; and an expansion of mutual recognition of academic credits and diplomas with foreign universities (MoE 2020, June 22).

Secondly, China seeks to foster foreign 'globally competitive, high-calibre professionals' trained in China. This is to be realized through the enhancement of courses and programs at Chinese universities (MoE 2020, June 22), in combination with extensive and active talent recruitment overseas. According to a recent report by the Australian Strategic Policy Institute (ASPI), China runs hundreds of recruitment

agencies overseas aimed at recruiting foreign talents to (partially) teach or develop research in China. This is done under the framework of China's more than 200 talents programs (Joske 2020). These foreign talents can subsequently work for Chinese companies in China or abroad. Alternatively, when they work in foreign companies, they can serve as a bridge to China.

The third set of goals concerns online education and aims to improve online education at home, strengthen the influence of China's online education abroad, and expand the provision of foreign high-quality educational resources to the less-developed central and western regions of China (MoE 2020, June 22). The fourth and last set of goals includes aims to increase the export of China's HE models to the world, to deepen cooperation with international organizations, to better promote the development of courses aimed at international learners, to expand Chinese language learning to more countries, and to strengthen the implementation of the 2016 Education Action Plan for the Belt and Road Initiative (MoE 2020, June 22).

This 2016 plan seeks to build connections between HE&R and BRI policies. This is a call that has been picked up by many stakeholders in the government and HE&R institutions. It has led to many concrete steps to build the nexus and has so far resulted in an acceleration of the modernization and internationalization of China's HE&R, a strengthening of China's positioning as a country that exports and shares knowledge, and an expansion of China's pool of well-trained talents. Internationally it results in a strengthening of China's attractiveness as a study destination and it supports the country's aim of building an education community led by China (D'Hooghe forthcoming).

The latter aim is closely linked to China's long-term goal to become a significant force influencing education elsewhere around the world (MoE 2019, October 21). In other words, the Chinese government wants to play a major role in the governance of education internationally. It hopes to achieve this through active participation in the development of international education rules, standards, and evaluation systems (CC 2019a), keeping track of broad global trends in education, and establishing 'platforms to facilitate international cooperation' (MoE 2019, October 21). For example, the Chinese government already works closely with international education experts at UNESCO and the World Bank to realize UN Sustainable Development Goal (SDG) 4, which aims to 'ensure inclusive and equitable quality education and promote lifelong learning' (Zhu 2019).

With regard to the implementation of open access to scientific publications, China is making limited progress. The Chinese government wants to have a voice in the international debate on open access. It announced in late 2018 that it supported Plan S, which aims to accelerate the transition to open access. However, it has not yet published supporting official guidelines or policies. The development of open access has been taken up by the Natural Science Foundation China, the Chinese Academy of Sciences, and a few individual libraries and universities, but has not yet been fully implemented (EC 2019 and Schiermeier 2019).

Impact of the Covid-19 pandemic

Impact on HE

In January 2020, China was struck by a Coronavirus epidemic that would soon develop into a pandemic. Once the news got out, the Ministry of Education reacted forcefully. On 21 January 2020 it asked relevant government organizations and educational institutions to take a broad set of preventive and control

measures against the coronavirus. The measures included: launching public health emergency response plans; giving support to poor, rural and remote areas where medical resources are limited; tracking the movements of students during the winter vacation; heightening awareness and dissemination of information through social media channels; cancelling unnecessary mass gatherings; and monitoring the state of health of students when they returned to school (MoE 2020, January 21). A week later it was announced that the start of the 2020 spring semester would be postponed (MoE, 2020 January 30). Then in early February this was followed by a notice from the Ministry of Education and the Ministry of Finance demanding that HEIs directly under their remit earmarked resources for the fight against Covid-19 (MoE 2020, February 10).

Throughout the spring and summer of 2020, relevant ministries worked to support HE in coping with the results of Covid-19. They published guidelines for HEIs (MoE 2020, March), offered practical support such as setting up a hotline to provide information about financial aid for college students, and supported the expansion of online education (MoE 2020, July 16). In September 2020, many Chinese HEIs welcomed students back to campus. As most students in China live in dormitories on university campuses, the virus could potentially spread rapidly within HEIs. Because of this, most HEIs in China have implemented strict epidemic prevention and control measures and many have made use of surveillance systems based on facial recognition, contact tracing, and temperature checks (Cadell and Corssley 2020). Furthermore, they have introduced new educational models combining online and offline teaching (He 2020).

The Chinese government also paid much attention to Chinese students studying abroad. The Ministry of Education (MOE) prepared a guide on Covid-19 for Chinese students abroad and invited Chinese experts on Covid-19 to give online lectures. It requested that Chinese embassies distribute health packages including face masks to Chinese students abroad and develop a reporting system to track these students' health status. Helplines were opened and in order to facilitate communication, WeChat groups were established by overseas Chinese student associations, Chinese embassies, and consulates. The Ministry of Education also called on overseas companies with Chinese investors and overseas Chinese communities to help meet students' immediate needs. In addition, Chinese embassies were called upon to monitor Covid-19 related discrimination and attacks against Chinese students (MoE 2020, April 6).

As a consequence of the Covid-19 pandemic employment possibilities around the globe have dropped and China is no exception. In order to bolster employment for graduates the Chinese Ministry of Education has taken two types of measures. It launched an online '24365 Campus Recruitment Service Campaign' for the 2020 HE graduates (Xinhua 2020, June 25) in collaboration with five leading job-hunting websites (MoE 2020, March 13). It has also expanded admission rates. It has increased admission of graduate students pursuing a master's degree, with a year-on-year increase of 189,000 students (in 2020 around 8.74 million college graduates are facing employment pressure due to the epidemic). It has also increased admission of students transferring to university undergraduate programs from technical colleges, with an increase of 322,000 from 2019. In doing so, priority is given to majors and professions that support national strategic needs and socio-economic development, such as clinical medicine, public health, integrated circuit design, and artificial intelligence (Zhou 2020).

Covid-19 also affects China's incoming student and staff mobility. At the time of publishing this report, academics and researchers holding visas are permitted to return to China but foreign students enrolled in universities are not allowed to pursue their studies in China (Sharma, 2020a)

Impact on research

The Chinese government, like the governments of many countries, is currently devoting much of its resources to Covid-19 research and is also making extra funding available for this cause. In early April 2020, China allocated special funds of approximately US$45 million to 68 scientific projects dedicated to Covid-19 research (Zou 2020). China is, together with the US at the centre of a global network of scientists involved in coronavirus related research. Contrary to what might be expected in view of the overall deterioration in the relationship between China and the US, scientists on the two sides have strengthened their bilateral research collaboration during Covid-19. This collaboration has produced more than 4.9 percent of all global articles, compared to 3.6 percent before the pandemic. During the Covid-19 period, China has also remained one of the three largest contributors to the funding of coronavirus related research. The other significant contributors are the US and the United Kingdom (UK) (Fry et al. 2020). Furthermore, the Chinese government has invested in various platforms and open databases to share Covid-19 related research with the international research community (China's State Council 2020). However, not everything is openly shared. In 2020, China has issued new regulations that require all academic papers on Covid-19, and in particular papers on the origin of the Covid-19 virus, to be submitted to the central government (including the Chinese Ministry of Science and Technology (MOST) for approval before they are published (Beach 2020). With this attempt to verify Covid-19 research, China wants to prevent the publication of research that does not fit into the narrative that the Chinese government is propagating about the outbreak and its handling of Covid-19. In particular it seeks to prevent the dissemination of findings that indicate that the Covid-19 virus originated in China (Kirchgaessner et al. 2020).

Conclusions and a look ahead

This chapter discussed recent developments in China's HE&R system. In summary, it can be concluded that China remains highly dedicated to strengthening its HE&R system and to improving the quality of research output. This dedication is evident not only in words, but also in the financial investments that have been made. The major driver of current HE&R policies is China's aim to be self-sufficient in S&T. Important features of China's current HE&R policies are the close alignment of HE&R with China's overall development policies, a continued focus on internationalization, and increasing limitations of academic freedom.

The Chinese government is currently working on two major policy documents relevant to HE&R. The first is the '2021-2035 National Medium- and Long-term Science and Technology Development Plan' and the second is the '14th Five-Year Plan (2021-25)' for national economic and social development. The latter will be followed by the launch of a 14th Five-Year Plan for Science and Technology. In the process of drawing up these plans, Chinese universities and research institutions (among others) are invited to contribute with suggestions and relevant research reports. Observers expect that the new Five-Year Plan will seek to expand investments in research and development of key technologies targeted in the '2030 Innovation Mega Projects' that were first outlined in the current 13th Five Year Plan and which are meant to be implemented in the period up to 2030. They include areas of next-generation infrastructure such as

big data, cloud technology, the Internet of Things, new generation artificial intelligence, quantum communication and quantum computing, smart manufacturing and robotics, and application of key new materials (MOST 2016). The '2021-2035 National Medium- and Long-term Science and Technology Development Plan' seeks to develop similar areas but also mentions developments in space technology, public health, advanced energy, ecology and environment, maritime technology (MOST 2019 and CER 2020).

Chapter II. Higher education and research collaboration with China: the state of play in Europe

Our 2018 report found that a large majority of European stakeholders in HE&R held the view that Europe and China are indispensable partners and should continue to engage and cooperate, but also that European governments and HE&R institutions needed to step up their game and base their cooperation on a thorough assessment of the risks involved (D'Hooghe et al. 2018). The research findings of the current report reflect a slight shift in views. While most stakeholders still emphasize the need to collaborate with China, a growing number of them have become more aware, and more concerned, about the risks that collaboration with China poses in terms of knowledge security and academic integrity.

In comparison with the situation in 2018, today's HE&R collaboration takes place in a political climate where many are far more critical of Chinese policies and behaviour. Furthermore, HE&R institutions are increasingly alarmed by incidents involving Chinese scholars, students, and the Chinese government. Recent incidents in Europe have included alleged espionage (Struys 2019) and refusals to share research data (D'Hooghe and Dekker 2020; Wallace 2020). We have also seen a request from a Chinese researcher to remove information about his politically sensitive research from the website of a European university where he did his PhD, because the Chinese authorities informed him that his research findings run counter to official policy lines and could have consequences for his current research work in China (Interview 19-10). An overview of incidents in the geopolitical context can be found in the Appendix.

This chapter examines how these shifts in national political environments and the increasing number of reported incidents have impacted HE&R collaboration with China. The chapter starts with a brief overview of the scope and content of existing collaboration. This is followed by a discussion of the relevant cooperation strategies being pursued by the EU and the eight selected European countries. After this, the chapter discusses to what extent government policymakers and stakeholders at institutions are aware of risks in HE&R collaboration with China, and to what extent they have taken action to address these challenges.

Scope and content of cooperation between Europe and China

Europe-China collaboration in higher education and research has increased exponentially in recent decades. Whether in the area of student mobility, inter-university collaboration, or cooperation between businesses and research institutions, European and Chinese actors continue to find one another. It is not only the Chinese side that approaches this collaboration strategically, as has been discussed in the previous chapter. European governments and institutions have also increasingly developed strategies in this respect. These deeply developed

relationships are indicative of what is at stake now that political tensions and the Covid-19 pandemic have started to affect international knowledge cooperation.

Student mobility

Europe is a popular destination for Chinese students and an increasing number of these students have chosen to study here in recent years. In fact, China is the number one source of international students to the EU, making up 11.2% of all international tertiary students and 18.2% of international graduate students in 2017. For many countries, including the UK, Germany, France, Italy, Ireland and the Netherlands, Chinese students are the largest group in at least one of these two populations (Eurostat 2019). However, the number of Chinese students in each European country varies greatly, something that can be attributed to the language of teaching, the reputation of the national education system, and the costs of studying in a certain country.

The leading country in this respect, and by a considerable margin, is the UK. The number of Chinese students in this country has rapidly increased, rising 34% over the last 5 years, growing to over 120,000 in 2019/2020 (Jeffreys 2020). The share of Chinese students has reached 35-41% of all non-EU students (Altbach 2019). Tuition paying students from China are an important source of income for UK universities, as their fees are two to three times higher than those paid by local students. This has created a level of financial dependence on Chinese tuition paying students that has caused concern among observers, concern which has only grown with recent political developments and the Covid-19 outbreak (Altbach 2019; Adams 2020).

After the UK, the most important destination countries for Chinese students in 2018 were Germany (30,023 students), France (23,494), Italy (15,167), and the Netherlands (5,089) (see Table 1). [1] Some countries have set up special programmes that aim to facilitate student mobility with China. An example is Italy's Marco Polo Project, which allows Chinese students to enrol at university programmes without requiring prior Italian language proficiency (Fu 2019). Conversely, 2018 saw 73,618 European students in mainland China, making up 15% of all international students in the country. France was the largest European source country in this regard with 10,695 French students studying in China (Chinese Ministry of Education 2019). Several European universities, including those from the UK, Germany, and France, have also established joint campuses in China through collaborations with local higher education institutions (Cai 2019).

The current political tensions between the US and China, which are resulting in policies imposing visa restrictions and withdrawing residence permits from Chinese scholars, have made Europe a more prominent option for Chinese students (Xinhua 2019). A 2020 survey found that for the first time since China opened its doors to the outside world, Chinese students prefer studying in the UK over a study in the US. In addition to restrictive US policies, this shift may also

[1] The numbers differ significantly between sources. For the sake of consistency, statistics of the OECD are used, because they are relatively complete compared to other sources.

be the result of visa policy reform in the UK, as well as the Covid-19 situation in the US (Chen and Ji 2020). Both Chinese and foreign scholars see a potential 'China pivot' towards Europe in HE&R amidst growing China-US tensions (Sharma 2020d).

Czech Republic	France	Germany	Italy	Netherlands	Sweden	UK	Europe*
414	23,494	30,023	15,167	5,089	2,579	107,813	197,340
0,9%	10,2%	9,6%	14,2%	4,9%	8,3%	23,8%	11,4%

**European OECD countries*

Table 1. Number of Chinese tertiary education students per country (first row) and share of total foreign students (second row) in 2018 (OECD 2020). *European OECD countries.

Research cooperation

Both China and Europe are global research powerhouses. The EU has the world's largest pool of researchers and produces the highest number of articles in science & engineering. In both cases, China ranks second. China also ranks second with regard to national R&D budget, but in that category it is the US who takes the top spot (Ingrid D'Hooghe et al. 2018; McCarthy 2020; Normile 2020). Both Europe and China have sought to profit from these favourable conditions by developing extensive research partnerships.

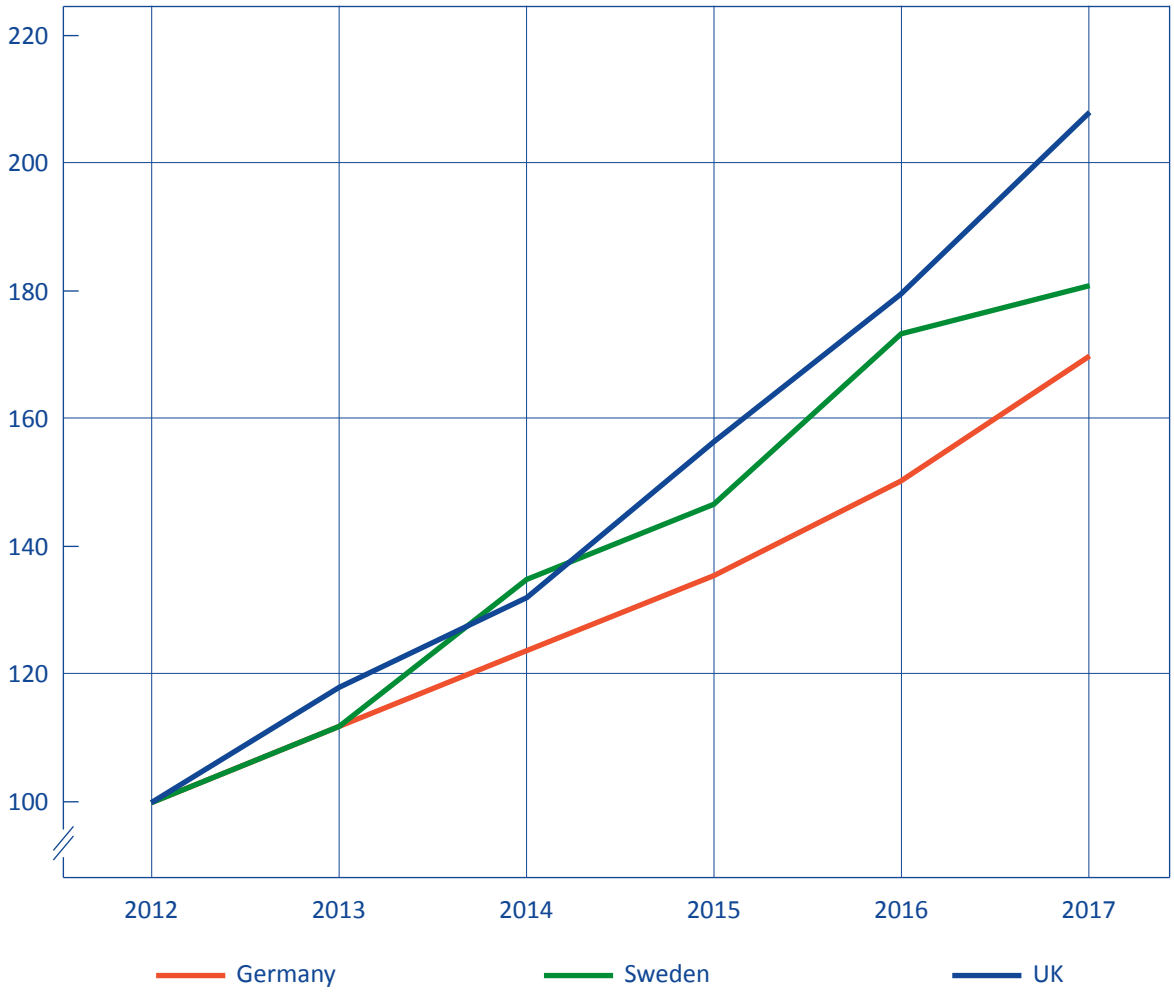
An indication of the deepening research cooperation is the growing number of Chinese-European co-publications. This number has grown exponentially in the last decade, as is illustrated in Graph 1. These co-publications also have a relatively high citation impact.[2] However, the number of co-publications differs significantly between different academic fields. As Table 2 demonstrates, the natural sciences, engineering, and the medical sciences have seen many more co-publications than the humanities. In those cases where the source of funding is acknowledged, it appears that co-publications are funded by China much more often than they are funded by Europe (European Commission 2019).

Another indication of the deepened research ties between China and Europe are the joint PhD programmes that have been set up between European and Chinese universities (Cai 2019). In total, there are about 4700 researchers who started publishing in China and who later moved to Europe to author more publications. Meanwhile, about 5000 scholars have done the same in the opposite direction. This latter group includes many Chinese researchers who have returned to China after studying and publishing in Europe.

Chinese companies have established or acquired 86 R&D centres in the EU. This constitutes about 37% of the total number of Chinese R&D centres abroad and is a higher number than in the US, signalling that many Chinese companies view the EU as an attractive R&D location. Multinational companies from the EU operate 349 similar facilities in China, which is more than

[2] See STINT 2018, p.6 for details on the definition of field-weighted citation impact (FWCI).

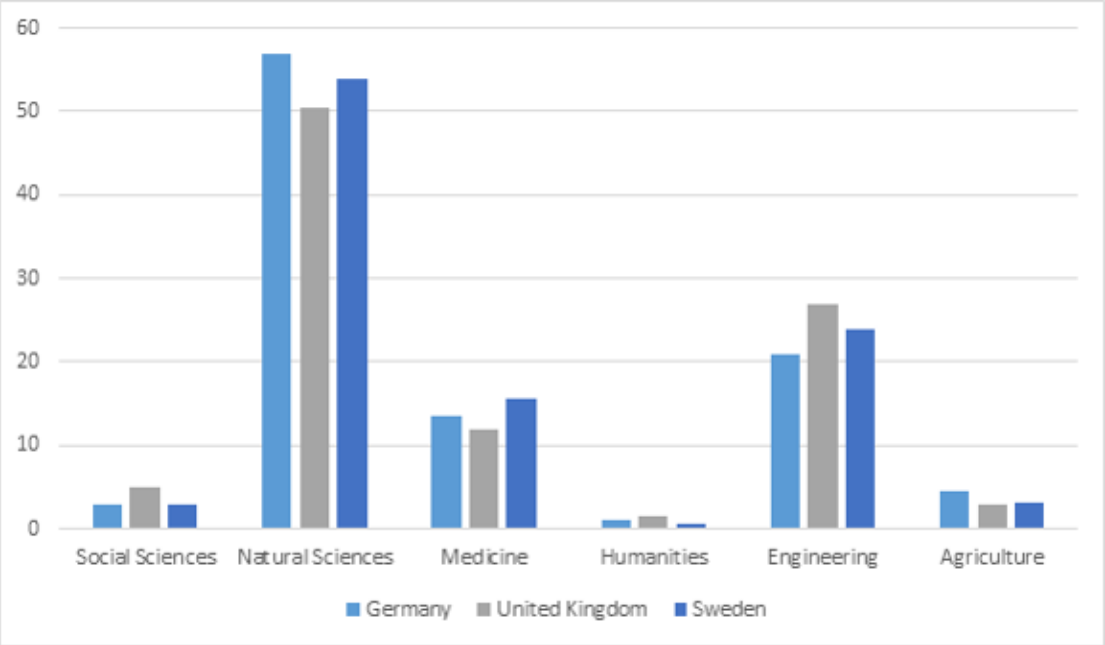
are operated by the companies from any other region. These companies are attracted to the abundance of high-quality researchers in China rather than low labour costs, while the access to specialized knowledge and the closeness to technology hubs are other important factors. Finally, private-public research collaborations between Europe and China have also increased in recent years (European Commission 2019).



Graph 1. Relative growth of co-publications with China (Estimation based on STINT 2018 figures).

Close cooperation in the field of research and innovation is also reflected at the level of the European Union. For example, China has been the EU's second most important partner within the EU research and innovation programme Horizon 2020 (Horizon 2020; Stec 2020). Under this programme, the two research powerhouses agreed to establish a co-funding mechanism where the EU would invest 500 million euros and China 130 million euros. By February 2020, Chinese entities had participated 464 times in over 2000 contracts under the Horizon mechanism that was set up in 2015 and renewed in 2018. However, the Chinese side has not always delivered.

Only 60% of joint projects have actually received Chinese co-funding and Beijing's spending has fallen short of the 130 million euros it committed to providing (Moran 2020).



Graph 2. Share (percentage) of academic fields of co-publications with China (Estimation based on STINT 2018 figures).

A similar picture of deeply developed cooperation appears when focusing on individual European countries. In Germany, HE&R institutions have signed almost 1400 cooperation agreements with Chinese partner institutions and there are approximately 2900 Chinese researchers working in Germany (HRK Key Questions 2020; EFI 2020). The German Academic Exchange Service funds and facilitates hundreds of exchanges between Chinese and German students and scholars (DAAD 2020). In 2018, France was the biggest recipient of China Scholarship Council (CSC) PhD scholarships in Europe (Campus 2018). Research cooperation between France and China currently involves nearly 3000 researchers from both countries and there are over 50 joint Franco-Chinese research structures. These structures include many laboratories, 25% of which cover the areas of medicine or biology, located in around forty French and thirty Chinese cities (Huang 2019; French Embassy 2014; and French Embassy 2018). Meanwhile, regarding research cooperation between China and the UK, the collaborative research output between the two countries doubled in the period 2014 – 2018. The UK is now China's second-largest science partner in terms of co-publications (after the US), while China is the UK's third largest (UK Science & Innovation Network 2020).

European strategic approaches

In the 2018 'Roadmap for EU-China S&T cooperation', the European Commission and Chinese counterparts list several priority areas, including food, agriculture, biotechnology, aviation, transport, urbanization, the environment, and health. Many collaborative research projects have been set up in these areas, while developing research infrastructure and promoting the mobility of researchers between Europe and China are also highlighted as key priorities. The European Research Council and the National Natural Science Foundation of China together facilitate research collaboration between grantees, while the EU's Joint Research Centre has signed research arrangements with multiple Chinese counterparts (European Commission 2018, Roadmap). A new roadmap for research collaboration under the framework of the Horizon Europe (2021-2027) Programme and the Chinese Medium- and Long-Term Science & Technology Development Plan for 2021-2035 has been announced (European Commission 2019a).

Under the Horizon Europe Programme, the EU will invest in research that will support European industrial competitiveness and innovation, and which will help tackle global challenges (Horizon Europe 2020; see also Tatlow 2020). While the EU considers science cooperation with China important and wants to continue investing in this, it has also experienced various problems. In addition to the shortfall in co-financing from the Chinese side, which has been mentioned above, there are problems with regard to data sharing, the mobility of researchers, research ethics, and intellectual property protection (Moran 2020; Wallace 2020).

It is not just the EU as a whole that has developed strategic approaches to knowledge collaboration with China, various individual European countries have also done so as well. The approaches of the three major HE&R partners of China are briefly discussed here as examples. In 2015, the German Ministry of Education and Research published a China strategy for the period 2015-2020. This strategy described how cooperation with China would contribute to the development of German knowledge and technology, to the strengthening of Germany as a centre for research and innovation, as well as to the opening up of the Chinese market for German companies (German MoE 2015). The Ministry is currently working on a new document to succeed this strategy.

In France a Joint Franco-Chinese Commission on Scientific and Technological Cooperation (COMIX) has defined priority areas for scientific cooperation between the two countries. In February 2019 both sides agreed upon seven priority themes: environment and climate change, space, health, agriculture, particle physics, advanced materials, and artificial intelligence (French Government 2019). However, critics of French HE&R policies complain that France is investing too little, that the projects reflect Chinese rather than French priorities, and that these projects are not well managed (Belloc 2018).

In the UK, the 2017 Joint Strategy for Science, Technology and Innovation Cooperation sets the framework for strategic collaboration with China. This collaboration encompasses three areas: basic research, innovation, and UK-China global partnerships. Major projects in past years have focused on agri-tech and healthy ageing. The projects under this framework are funded by the UK-China Research and Innovation Partnership Fund. Between 2014 and 2017, both sides jointly committed 220 million euros to support projects under this fund (UK Department for Business, Energy and Industrial Strategy 2017). The collaboration is managed and directed by UK Research and Innovation (UKRI), a government body that brings together the UK's major research councils.

Political climate and awareness

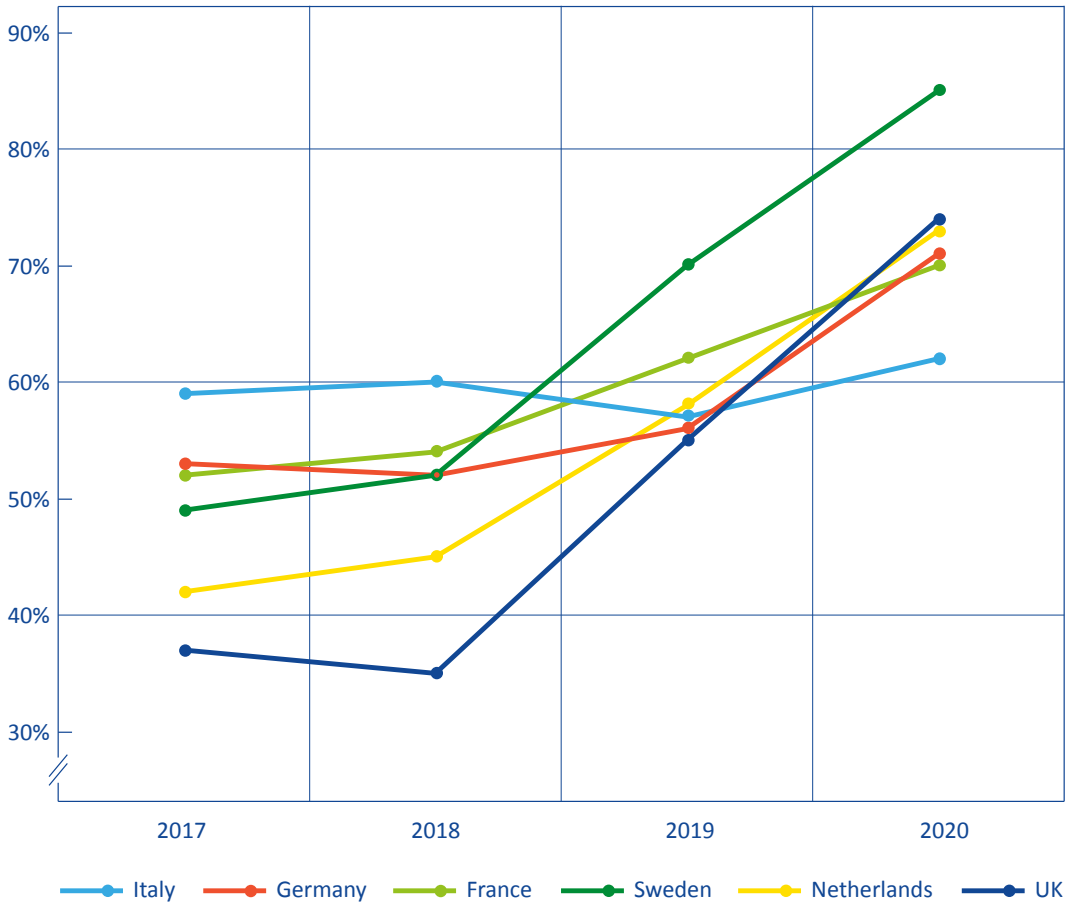
In recent years, relations between Europe and China have become less straightforward. While pressure from the US to take a side in the US-China conflict on trade and technology has contributed to this development, European repositioning with regard to China has largely occurred in response to Chinese policies at home and abroad. In the past two years several Chinese policies have raised grave international concern and criticism. They include the repression of Uyghur and Mongol minorities in China, political and security interventions in Hong Kong, the arrest of Canadian former diplomat and International Crisis Group advisor Michael Kovrig, and China's Covid-19 diplomacy. The growing unease is reflected in recent opinion polls regarding European views of China. These polls find that large majorities in Europe have unfavourable views of China (Silver et al. 2020) (see Graph 3).

It is in this uneasy climate that HE&R cooperation between Europe and China takes place. In some European countries, collaboration has already been affected by political developments, while in others collaboration appears to be continuing largely as before. In the following section, this report will give a brief overview of the political climate in the EU and the eight selected countries. It will also discuss the extent to which this has resulted in a heightened awareness of the potential challenges and risks involved in HE&R cooperation with China.

EU

In 2019, the EU published 'EU-China, A Strategic Outlook' which redefined its relationship with China. The document labelled China 'an economic competitor in the pursuit of technological leadership, and a systemic rival promoting alternative models of governance' (European Commission 2019). This reflected a shift in the way Europe views the challenges and opportunities presented by China, with the challenges starting to tip the balance in certain areas. Dissatisfaction about the lack of a level playing field in economic cooperation, China's efforts to politically divide European countries, and the above-mentioned Chinese policies, have led to tensions and less favourable European perceptions of China. Although the EU continues to work

towards enhancing its economic relationship with China, it is currently also exploring ways to reduce its economic dependency on China (Oertel 2020b). China's Covid-19 diplomacy has accelerated this shift, leading to a convergence of scepticism about Chinese intentions among EU member states and to a further deterioration of perceptions of China. According to a poll in ten European countries by the European Council on Foreign Relations, a median of 42% of respondents said that their views of China had worsened during the coronavirus crisis (Oertel 2020a).



Graph 3. The growth of unfavourable views of China: percentage of respondents with an unfavourable view of China in six European countries. Source: Pew.org (Silver 2020).

These developments have spilled over into the sphere of EU-China HE&R cooperation and led to more awareness of challenges and risks in collaboration with China. For instance, in July 2020, a member of the European Parliament asked parliamentary questions about Chinese influence at European universities and inquired if the European Commission was planning to address the issue (European Parliament 2020). Furthermore, in the Joint Communiqué following the fourth EU-

China High Level Innovation Cooperation Dialogue, which was held in April 2019, issues such as research integrity, intellectual property protection, research ethics and reciprocity were put on the agenda (European Commission 2019b). Finally, in response to the EU's 2019 'Strategic Outlook', the Directorate-General for Research and Innovation organized an event on knowledge cooperation with China. This event called for a comprehensive approach to tackle foreign interference in European HEIs and research institutions. The meeting also set in motion the drafting of EU guidelines on tackling foreign interference in HE&R institutions (European Commission 2020). This initiative is supported by EU member states but also by various HE&R institutions and organizations such as the League of European Research Associations (LERU), an association of 23 European research universities (Interview 30-9).

Belgium

In recent years, the Belgian political climate with regard to China has become more critical. This has been caused by growing concern about Chinese policies and diplomacy but also by several espionage incidents involving China. The country is reported to be popular among Chinese intelligence agents because it hosts important international institutions, such as those of the EU and NATO, though there have also been espionage incidents in the economic sphere (SCMP/Bloomberg 2019). Concerns about Chinese influence in Belgium's HE&R sector are also rising. In 2019, the Free University of Brussels (VUB) decided not to extend its Confucius Institute contract with the Confucius Institute Headquarters (Hanban), after the former head of the institute was accused by Belgian security services of being a recruiter for Chinese intelligence (Lo 2020). In its 2019 annual report, the Belgian State Security Service warned against Chinese activities related to dual-use, technology transfer and ethical risks (VSSE 2019). Security services have also started contacting institutions and researchers to express concerns about collaborative research projects that involve sensitive technology and are working with a list of Chinese universities with which certain collaboration is not allowed (Interviews 11-9 and 14-9).

Calls have been made for Belgian universities to take a collective standpoint. The Flemish minister of education has also argued for a Flanders-wide approach to counter Chinese political interference, one that goes beyond the HE&R sphere to include other sectors of society as well (Holslag 2019; Struys 2019). In December 2019, the Flemish Inter-university Council (VLIR) published general recommendations for Flemish universities to assess human rights related questions in their international cooperation (VLIR 2019). Although universities are in the process of exploring possible approaches to China, a China specific policy for HE&R collaboration has not yet seen the light (Interview 11-9).

Czech Republic

The Czech Republic has a complicated relationship with China. Under the presidency of Miloš Zeman, the country has strengthened its relations with China. In 2016, the two countries signed a strategic partnership agreement. The Czech Republic had already joined the 16+1 (later 17+1) Forum in 2012. However, the country also has a long tradition of opposing China (Karásková et al 2020) and President Zeman's engagement with China is contested by many other politicians who are critical of China's human rights record and who see little actual Chinese investment in the country. A visit to Taiwan by the Czech Senate President recently developed into a major incident. After he announced his intention to visit Taiwan, the Chinese embassy in Prague sent an official letter warning that the visit could negatively affect Czech companies in China. This in turn made the Czech Prime Minister request the replacement of the Chinese ambassador (Reuters 2020). When a group of prominent Czech politicians visited Taiwan anyway, the Chinese Minister of Foreign Affairs warned that the Czech Republic would pay a 'heavy price'. This retaliative diplomacy from China was subsequently condemned by the Czech Prime Minister and various other European leaders (Ponikelska and Dudik 2020).

The politicized and polarized debate on China has also reached the sphere of knowledge cooperation. Czech scholars working on, or with, China feel they are under pressure to take a side in this debate and to explain and defend their position (Interviews 25-5, 9-6 and 19-6). In 2019, the Czech HE&R sector was shaken by a case of Chinese influence. The Czech-Chinese Centre at Prague's Charles University had to close its doors after a scandal where it was found that the university received secret payments made by the Chinese embassy. The payments fuelled concerns that the centre was being used by Beijing to increase its influence in Czech academia (Lazarová 2019). In addition, various universities have experienced smaller incidents of Chinese influence such as the censorship of topics in educational programs (Interviews 25-5 and 19-6). Our interlocutors stated that, partly as a result of questions raised in the Czech Senate about Chinese influence in Czech academia, awareness of the challenges involved in HE&R cooperation with China was growing. However, they said that this awareness was still very limited. Czech security services are briefing universities and some universities are sharing information and best practices. Charles University in Prague is developing a manual on how to collaborate with China (Interviews 25-5, 9-6, and 19-6).

France

Under President Macron, France has adopted a relatively low profile on China in the last few years. The bilateral relationship, which is of economic and geopolitical importance to France, is stable. Although the French government decided to exclude Huawei from their telecom networks, they have managed to do so without attracting much criticism from China. However, perceptions about China among the French public have become increasingly negative, in line with most of the rest of Europe. Still, this has not resulted in major debates on China in France's

parliament, as has occurred in other European states. In contrast with the low profile with regard to China at home, France is regarded as being at the core of the critical reassessment of the EU's approach to China (Hall 2020; Oertel 2020).

The absence of major political debates on China in France is reflected by the lack of public debates on HE&R cooperation with China. In spite of reports about risks and about cases of Chinese espionage and influence in French universities, made by both government organizations and an investigative journalist (Izambard 2019), there are few indications that there have been wide discussions within or between universities (Interviews 14-9 and 17-9). There is a consensus among universities that a more careful approach is called for (Interview 17-9), but no guidelines have been brought to the attention of this report's authors.

Germany

Recently, the debate on China in Germany has become increasingly politicized. Because of Germany's major economic interests in collaboration with China, Chancellor Merkel has long tried to separate economic from political issues. However, this has become no longer possible. The growing intertwinement of economic and political interests, such as in the cases of Huawei's role in 5G and the management of Covid-19, combined with the repression in Xinjiang and Hong Kong, and the growing competition of Chinese companies with German businesses, has resulted in a repositioning vis-a-vis China (Karnitschnig 2020). In September 2020, the German government signalled a new direction in its 'Policy guidelines for the Indo-Pacific', aiming to reduce economic dependence on China and to deepen relationships with Asian democratic countries (Coby Goldberg 2020; German Federal Government 2020).

Until recently, German government documents on HE&R cooperation with China, including the 'China Strategy 2015–2020' produced by the Ministry of Education and Research, made no mention of issues such as 'dual-use', 'research ethics' or 'human rights' (German Ministry of Education and Research 2015). A more recent, extensive report similarly pays relatively little attention to such challenges (German Ministry of Education and Research 2020). However, Germany's international intelligence agency has warned about the potential for the transfer of sensitive and strategic technologies to China through Chinese students and researchers (Sharma 2020c). Various incidents that have occurred so far in 2020 have further raised awareness in Germany about these issues (Interview 3-7). Several universities have closed their Confucius Institutes, while the German government has indicated 'that the Chinese state or the Chinese Communist Party influences events, teaching content and materials at Confucius Institutes in Germany' (Sharma 2020c). The Free University of Berlin faced criticism after it signed a contract for a Chinese teacher program funded by China that forced the university to abide by Chinese law. It was said that this could give the Chinese government leverage to censor teaching programs (Welt 2020; Matthews 2020). Furthermore, questions raised in the German Bundestag highlight a growing awareness of potential challenges with regard to academic freedom and

political influence (Deutscher Bundestag 2020; Deutscher Bundestag 2019). A recent report by a government-established, expert commission highlights technology-related challenges, including 'dual-use' of technology (EFI 2020; see also Tatlow et al. 2020b). Our interlocutors mentioned that the debate on China among German scholars has become polarized and, as a result, less open (Interviews 3-7, 11-9, 1-10). Awareness among HE&R institutions in Germany is growing rapidly. This is evidenced by an initiative taken by the German Rectors Conference, a group representing more than 30 German HEIs, to draw up a document with 'guiding questions' on university cooperation with China (HRK 2020). This initiative followed the publication of general guidelines and standards for all international university cooperation in April 2020. This China-specific document will be discussed in Chapter III.

Italy

Italy is an interesting case that demonstrates the swiftness with which a national approach to China can turn around. In 2019, the former Italian government adopted a relatively pro-China course and joined the Belt and Road Initiative. After a cabinet crisis resulted in a new composition of the cabinet, the government brought its China policy more in line with that of its traditional European allies. This alignment was exemplified by the exclusion of Huawei from Italy's 5G network (Poggetti 2019). The former coalition party Lega Nord also shifted its position on China, further illustrating the volatility of Italy's political approach to China (Interview 17-9). These complexities have only expanded as a result of China's so-called 'Face Mask Diplomacy' and the competition between China and Italy regarding narratives about the origins of, and responses to, the coronavirus.

There are little to no signs that in Italy the politicized debate on China has resulted in concrete policy measures or documents regarding safe cooperation with China in HE&R. Such policies and documents are not seen either at the government level or at the level of institutions (Interviews 13-7, and 10-7). This is not to say that individual institutions are unaware of, or are failing to deal with, the potential challenges (Interview 17-9). Furthermore, a lively public discussion among China scholars on issues such as academic freedom and Confucius Institutes has emerged in Italy recently (Scarpari 2019; Andreini 2019). The US is also attempting to further raise awareness of potential challenges at universities in Italy. It has stepped in at least once to intervene in a research project between Italy and China (Interview 10-6).

The Netherlands

The government of the Netherlands has recently repositioned itself with regard to China. In 2019, it published its first-ever public China policy paper. This document reflected a shift from a liberal and pragmatic strategy towards China, that was largely based on economic interest, to an approach that takes into account the challenges that China is posing to national security and global governance (Dutch Ministry of Foreign Affairs 2019). The policy paper highlights challenges

in the economic, political, and science and technology sectors and calls for more China knowledge and expertise in the Netherlands. A majority in the Dutch parliament found that the policy paper was not critical enough and requested that the government extend the chapter on China's human rights situation. In 2020, China's Covid-19 diplomacy, reports on China's growing influence and interference in Europe, and China's harsh response to the renaming of the Dutch representative office in Taiwan, have led to a further deterioration of Dutch views of China (RTLZ 2020; Den Daas 2020).

The political climate is reflected in the relatively numerous Dutch calls and initiatives that seek to raise awareness about, as well as to tackle, challenges in HE&R cooperation with China. The 2019 policy paper on China explicitly mentions the potential risks of such collaboration. It states that these include political interference, a lack of academic integrity, and unwanted technology transfers (Dutch Ministry of Foreign Affairs 2019). A 2020 report by a Dutch think tank highlighted the risks of increasing Chinese censorship in academic publishing and self-censorship with regard to China among Dutch scholars (D'Hooghe and Dekker 2020). In 2019, a 'Checklist for Collaboration with Chinese Universities and Other Research Institutions' was published, based on the findings of the 2018 LeidenAsiaCentre report which serves as a prequel to this study (HCSS 2019). This 'Checklist' will be discussed in the next chapter. In the past one and a half years, various Dutch universities have started to develop approaches aimed at promoting safe cooperation with China and with foreign partners in general (Reference Group).

Dutch government activities and research to strengthen knowledge security and academic integrity in HE&R collaboration with China have so far largely been focused on Dutch research universities. Currently, attention is being drawn to the fact that universities of applied sciences are also part of the equation. Their research into applied sciences and their close cooperation with manufacturing and tech sectors can be expected to be of interest to the Chinese government. Students who do internships at high-tech and logistics companies and strategic organizations such as seaports or airports may have access to strategic information. While the magnitude of these risks has not yet been mapped, it is clear that universities of applied sciences need to be extensively involved in developing approaches to improve knowledge security in HE&R (Interview 15-10).

Sweden

Political relations between Sweden and China are currently in dire straits. China's abduction in 2015 of the Swedish national and Hong Kong bookseller Gui Minhai, and his subsequent prosecution in China, has been one of several incidents negatively affecting the relationship between the two countries. Unfavourable views on China in Swedish society are at an all-time high (81% of respondents) and induce political organizations to position themselves. For example, various city governments have cancelled their partnership agreements with Chinese cities (Myklebust 2020). In 2019, the Swedish government published a policy paper on China, in

which it discussed the need to manage security challenges posed by China's growing ambitions in Europe. The paper also called for 'powerful cooperation' within the EU to deal with issues ranging from digital security to defending values (Swedish Ministry for Foreign Affairs 2019).

Despite the problematic political relationship, which has resulted in all Swedish HE&R institutions severing their ties with Hanban (Myklebust 2020), the Swedish government has sought to further develop HE&R collaboration with China and commissioned a report to this end. This report recognized the potential challenges, including those regarding intellectual property protection, research ethics, and data management, while it also stressed the importance of approaching the cooperation strategically. The document furthermore called for the establishment of a China studies institute tasked with collecting and reinforcing China expertise (Regeringskanliet 2018; STINT 2018). Moreover, a debate over university cooperation with Huawei has arisen. Meanwhile concerns over the economic output of research have also been fuelled by the outcome of a Sino-Swedish collaborative research project, which resulted in dozens of patents for the Chinese side, and few or none for the Swedes (Interview 15-9). In 2020, the Swedish Foundation for International Cooperation in Research and Higher Education (STINT) developed 'Guidelines for reflection on international academic collaboration'. This will be discussed in Chapter III (Shih 2020; Interview 15-9).

United Kingdom (UK)

The relationship between the UK and China has cooled considerably in the past two years. Major causes of growing tensions include the political clampdown on Hong Kong and China's launch of the Hong Kong National Security Law, which is seen as undermining the 1985 Sino-British Joint Declaration on Hong Kong. They also include the UK government's decision to remove all Huawei technology from 5G networks by 2027 (Christopher Giles 2020). While the UK, with an eye on Brexit, has much interest in the economic opportunities of collaboration with China, political and security concerns as well as US pressure to side against China weigh heavily in the debates on the UK's China policies.

The spillover of political tensions into the sphere of HE&R cooperation with China has been relatively extensive in the UK. In 2019, a House of Commons committee published a report in which it warned of Chinese interference at UK universities, including censorship activities and the harassing and monitoring of students. It accused both the government and HE&R institutions of failing to acknowledge the problem (House of Commons Foreign Affairs Committee 2019a&b). In 2019, the London School of Economics suspended its plan for a China programme, after academics criticized the fact that the proposed programme was to be funded by an outspoken Chinese defender of Beijing's policies (Riordan 2019). In another development, ties between British universities and the Chinese tech company Huawei have been scrutinized. Oxford University has already suspended new research funding from Huawei (Sharma 2020c; Sharma 2019f). British intelligence agencies have furthermore expressed concerns with regard to Chinese

students and the state theft of intellectual and research property from universities (Kerbaj and Griffiths 2019). In order to protect students of China studies from retribution by the Chinese government under the recently launched Hong Kong National Security Law, which claims jurisdiction over people outside Hong Kong, Oxford University has asked students to submit China related papers anonymously and to not record any classes (Wintour 2020).

The debate on the risks and challenges of collaboration with China and other countries has led to the recent launch, by the Centre for the Protection of National Infrastructure, of a website that provides various 'trusted research guidance' documents for academia (CPNI n.d.). It has also led to the publication of two sets of guidelines. The first, titled 'Managing risks in Internationalisation: Security related issues' (UK Universities 2020), has been produced by Universities UK, a group of 140 universities in the UK. The second, titled the 'Code of Conduct' [for the] 'Protection of Academic Freedom and the Academic Community in the Context of the Internationalisation of the UK HE Sector' (AFIWG 2020), has been developed by the Academic Freedom and Internationalisation Working Group.

Conclusion

Europe and China have developed extensive collaboration in HE&R and consider each other important, if not essential, partners in advancing science. Whether it is in the area of student mobility or research cooperation, the relationship appears to have expanded and deepened in recent years. However, current Europe-China HE&R collaboration is facing a number of challenges. The most acute of these challenges has been posed by the Covid-19 pandemic, which has seriously hindered the mobility of researchers and students. A second challenge concerns the growing gap in research funding between China and Europe. As discussed above, China's investments in HE&R keep rising, whereas HE&R budgets in Europe are under pressure. As a result, European HE&R runs the risk of falling behind in a growing number of research areas and becoming dependent on Chinese research talent and funding. A third challenge involves finding the right balance between managing the risks and grasping the opportunities of collaboration with China. This has become increasingly difficult in the current polarized political climate with regard to China. The risks are very real, but so are the benefits and the urgent need to improve the quality of EU HE&R. Scholars in both Europe and China feel it is becoming more difficult to develop collaboration between China and Europe and that HE&R institutions and scholars are under pressure to justify their collaboration with China (interviews 19-6, 3-7, 1-10 and 20-10).

This chapter has provided snapshots of developments in eight European countries and the EU. It has illustrated that, overall, awareness of the risks involved in collaboration with China is growing. This appears to be more the case in Germany, the UK, Sweden, the Czech Republic, and the Netherlands, than in France, Belgium, and Italy. Awareness is also greater among government organizations and China scholars than among other groups within HE&R institutions.

There has been a growing number of public reports on cases of Chinese interference, which highlight the challenges of collaboration with China. This may be the result of growing scrutiny by European stakeholders as much as of growing interference by China, pointing to a higher level of awareness of risks in collaboration with China. Issues that have attracted particular concern relate to academic freedom, unwanted technology transfers, political interference, dual-use technology, and research ethics. Several documents have been published to address these issues, sometimes specifically with regard to China, and at other times in a more generic manner. These efforts are analysed in more detail in the next chapter.

Chapter III. Approaches for sustainable collaboration

Chapter II illustrated that there is a growing group of European stakeholders in international collaboration in HE&R who see a clear need for developing or expanding capacity and tools to strengthen knowledge security and academic integrity in HE&R Institutions. Various stakeholders, at the government, institutional, and inter-institutional level, have taken steps in this direction. Some stakeholders with national reach have developed broad guidelines for sustainable international collaboration in HE&R. At the same time, institutions and universities have also implemented their own measures to strengthen knowledge security and academic integrity. In many cases, the risks and challenges involved in collaboration with China have been the primary driver for designing such guidelines and measures. However, risks are also at play in collaboration with other countries apart from China (see e.g. Baykal A. and Benner, T. 2020). Therefore, stakeholders have called for an overall strengthening of knowledge security and academic integrity in the internationalisation efforts of HE&R institutions and for the development of country neutral guidelines. While this report focuses on the case of China, it recognizes the importance of addressing the issue from a broader perspective.

This chapter seeks to contribute to European initiatives towards sustainable HE&R collaboration with China. The chapter discusses what developing an approach to dealing with risks in international knowledge collaboration entails. It compares existing country neutral and China specific approaches, discusses the dilemmas and challenges involved, and highlights the areas to which it is important to pay particular attention. In doing so, it draws upon both literature as well as the views of interlocutors about the existing challenges and about the shape that an approach towards building safe cooperation with China should take.

The need for a structured and comprehensive approach

The premise of this report is that it is in the interest of European governments and HE&R institutions to develop and implement guidelines and mechanisms aimed at strengthening knowledge security and academic integrity. First of all, such frameworks will contribute to safe collaboration with China. As has been discussed in the previous chapter, and is illustrated by the overview of incidents and research findings provided in both the Appendix and in the 2018 LeidenAsiaCentre report on Europe-China collaboration in HE&R (D'Hooghe et al. 2018), there are multiple challenges involved in cooperation with China. These challenges can be split into three categories: (1) breaches of academic integrity; (2) breaches of knowledge security; and (3) lack of reciprocity (see box 3). Managing these challenges is an extensive and daunting task. It

entails that broad actions be taken by stakeholders at various levels, with different types of actors involved at each level. Nonetheless, it is important that stakeholders take these challenges seriously and develop ways to address them. The implementation of a framework for sustainable collaboration will also force European stakeholders to critically consider the long-term and broader political, security, and societal impact of proposed and ongoing cooperation.

Risks in HE&R collaboration with China

Breaches of academic integrity:

- Infringements on academic freedom
- Not living up to ethical standards in research
- Political influence efforts
- Dual-use and unintended use of findings

Breaches of knowledge security

- Undesirable transfer of knowledge
- Cyber attacks
- Espionage
- Infringements on intellectual property rights

Lack of reciprocity in cooperation

- Lack of transparency
- Lack of equal access to research and facilities
- Non-compliance with contracts

Box 3. Risks in HE&R collaboration with China; authors.

Developing a clearly formulated framework reduces the potentially disadvantageous effects of HE&R collaboration with China. It also provides clarity and confidence to stakeholders at a time when many concerns have been raised regarding cooperation by political actors, the media, scholars, university policy makers, and various societal forces. It is unlikely that the areas of concern will soon be assuaged by changes in China or that the political climate in Europe with regard to China will become significantly less critical in the near future. As a result, it can be expected that European national governments and societies will increasingly question HE&R institutions regarding economic and political risks in collaboration with China.

The implementation of a transparent set of guidelines can provide institutions and researchers with support in formulating a response to these demands. At the same time, such guidelines can help to empower or authorize projects that are in line with relevant criteria. Finally, transparent guidelines can also help institutions and researchers to explain to Chinese counterparts why specific requests or decisions have been made. They are therefore also in the interest of Chinese stakeholders.

As Chapter II has shown, China is an important partner for European HE&R institutions and actors on both sides are looking to expand and deepen this collaboration. Academia thrives on international cooperation and networking. International research projects and educational exchanges contribute to advancing science and achieving breakthroughs in research. As will be discussed below, stakeholders calling for the strengthening of knowledge security do not seek to downscale collaboration with China. Instead, they aim to improve the sustainability of this cooperation by providing suggestions on how to design a successful approach that deals with potential challenges. This report serves a similar goal.

Managing risk entails:

Protecting

- People: staff, scholars and students, including Chinese students, against Chinese interference
- Hardware and software: against hacking and theft
- Knowledge and data: against theft and unwanted/dual-use
- Academic integrity, including ethical standards and academic freedom
- Financial and political independence
- Reputation

Promoting

- Awareness of risks
- Knowledge of relevant foreign academic systems and educational and science policy goals
- Knowledge about collaboration partners and their agenda's
- Transparency:
  - Transparent relations with Chinese partners
  - Transparency about relations and collaboration with China
- Reciprocity in cooperation with China
- Compliance with rules and guidelines
- Due diligence

Avoiding

- Discrimination of Chinese scholars and students
- Reputation damage

Box 4. What managing risks entails; authors.

Developing approaches

This section deals with major questions regarding the design and implementation of a framework for strengthening knowledge security and academic integrity. It starts with a brief overview of the existing approaches that, together with input from interlocutors, inform this discussion. After

this, the section addresses the many different aspects that stakeholders should consider when designing a comprehensive approach to sustainable HE&R collaboration with China. Then the section moves on to discuss the content that such an initiative must include. Finally, it addresses the importance of China expertise.

Existing approaches

Important input for this chapter is provided by the various guidelines for developing sustainable collaboration with China that have been recently published by different European nations. Five of these sets of guidelines will be analysed in this section. The five have been selected based on their national reach as well as their comprehensiveness or the fact that they address both knowledge security and academic integrity. Alongside these five approaches to collaboration, one other comprehensive initiative that needs to be mentioned is the European Commission's 'Tackling Foreign Interference in Higher Education Institutions and Research Organisations' (EC 2020). This is still in the process of being drafted. It is significant that the European Commission has taken this initiative. Once finalized, this publication may provide important input and encouragement for EU member states that have less capacity or a lower sense of urgency to develop national guidelines by themselves.

The five comprehensive approaches that inform the discussion are:

1. 'Key questions on university cooperation with the People's Republic of China.' Published by the German Rectors Conference (HRK), an association of 268 German universities. Hereafter referred to as the German guidelines (HRK 2020a, September).

2. 'Checklist for collaboration with Chinese universities and other research institutions.' Published by the Dutch think tank The Hague Center for Security Studies. Hereafter referred to as the Dutch guidelines (HCSS 2019).

3. 'Responsible internationalisation: Guidelines for reflection on international academic collaboration.' Published by the Swedish Foundation for International Cooperation in Research and Higher Education (STINT). Hereafter referred to as the Swedish guidelines (STINT 2020).

4. 'Managing Risks in Internationalisation: Security Related Issues.' Published by Universities UK (UUK), an association of 140 UK universities. Hereafter referred to as the UK guidelines (UUK 2020). They are connected to the 'Trusted Research' initiative of the Centre for the Protection of National Infrastructure (CPNI) and the National Cyber Security Centre (NCSC) (CPNI and NCSC, 2019), which will also be discussed.

5. 'Guidelines to Counter Foreign Interference in the Australian University Sector.' Published by the Australian Department of Education. Hereafter referred to as the Australian guidelines (Australian DoE 2019).

See Table 1 below for an overview of how these five sets of guidelines compare on a series of criteria.

Guidelines	German	Dutch	UK	Swedish	Australian
Length in pages	19	18	62	16	47
Drafting process	Developed by large university association	Developed by think tank upon request Dutch government	Developed by large university association upon request MoE	Initiative of and developed by national research organisation	Developed by government and HE&R sector
China specific or country neutral	China	China	Country neutral	Country neutral	Country neutral
Goal	Provide stimulus, support & orientation in developing resilent partnerships with China	Help decision-makers to assess risks and limitations of cooperation with China	Support and enable universities to protect themselves, their staff and students, and to manage risks	Provide a basis for discussion on strategic decisions in internationalisation	Empower institutions to deepen resilience against foreign interference
Design	Guiding questions underpinned by objectives + further reading & links	Guiding questions underpinned by literature + further reading	Recommendations, case studies, scenario's, lessons learned, links to resources and guidance materials	General guiding questions + further reading	Guiding questions, scenario's, best practices, links to resources and guidance materials
Focal points	- Strategy and governance - Academic integrity - Knowledge security - Quality in cooperation - Support open and intenational universities - Intercultural aspects	- Agenda setting - Academic freedom - Knowledge transfer	- Knowledge security - Academic integrity - Protecting values, reputation, people, campuses, research, and transnational education	- Political, social, cultural and legal context of the partner country - Motivations for collaborating - Strategic design of collaborations	- Governance and risk frameworks - Due diligence - Communication - Knowledge sharing - Cyber security
Level of guidance	Relatively detailed and practical guide	General guidance	Very detailed and practical guidance	Raising awareness, low practicality	Very detailed and practical guidance
Alignment with gover-nment policies	No	Yes, commissioned by government	Yes, linked to Trusted Research guidelines and tools	No	Yes, developed and implemented together with the government
Responsibility for implementation	Unspecific: Universities and individual researchers	Undefined	Governing body and senior Leadership of HEIs	All actors involved	Senior executive or executive body
Periodic updates of guidelines	Yes	No	Yes, 2021	No	Yes

Table 1: Guidelines' main characteristics; authors.

Challenges and dilemmas

Managing the risks involved in collaboration with China is challenging for HE&R institutions. This is not only because of the scope and diversity of actions that need to be taken. It is also because of the fact that not all stakeholders at universities and research institutions agree on the extent to which collaboration with China needs to be addressed in such a way. Many scholars are worried about potential limitations to the open character of education and research or dread complicated and slow procedures brought about by new rules and regulations. Some fear a negative impact on the many sound and fruitful cooperation projects with Chinese partners.

Some are also concerned that guidelines might increase the risk of discrimination of scholars and students from China. Others want to avoid the risk that they have to miss out on valuable Chinese research funding. HE&R institutions are worried about their autonomy, as well as the financial and personnel burden that developing and implementing measures may bring.

Two European interlocutors brought up the issue of inter-institutional competition and the lack of trust and solidarity between institutions. This is an issue that is seldom openly discussed, but which may play an important role in HE&R institutions' reluctance to implement measures. This relates to concerns that when an institution decides not to go ahead with a project for reasons of academic integrity, a less dutiful competitor will reap the funding and talents involved and strengthen their competitive position (interviews 21-9 and 30-9).

There are many such dilemmas that HE&R institutions need to address when they are setting up a system to manage risks involved in cooperation. These include:

- Safety versus openness: European scholars, like many elsewhere in the world, treasure the openness of their academic and research environments; shielding knowledge from specific colleagues goes against the increasingly common practices of open access and the open sharing of information and could be perceived as nationally-based discrimination.
- Safety versus independence: scholars value their high degree of independence from national politics and the policymakers at HE&R institutions; having to adhere to rules and guidelines potentially limits this autonomy.
- Short term benefits versus mitigating short term and long term risks: short term benefits, such as funding and the availability of talented researchers, are more tangible than potential risks and (potential) long-term negative consequences such as loss of competitiveness.
- Individual interests of a researcher or institution versus national or societal interests: the benefits of collaboration for individual scholars and institutions may be important for their competitiveness or even survival and may therefore be perceived as being more urgent than less tangible national political or societal interests.
- The benefits of strengthening knowledge security versus the financial burden of implementing measures: the financial costs of implementing measures to effectively manage the risks of collaboration may be high whereas benefits will be less tangible and difficult to express in terms of finance.

These dilemmas are not easily solved. However, three concepts may help to put the questions into perspective: reciprocity, proportionality, and trust. With regard to the first dilemma, it is important to keep in mind that openness, the sharing of information, and open access only works on the basis of reciprocity. In collaborations with Chinese partners, reciprocity in transparency,

data sharing, and access to research and facilities is regularly missing. Chinese partners are seldom fully transparent about their affiliations, agenda, responsibilities, and the decision-making structures with regard to joint projects. In collaborations, the Chinese side frequently does not share the project related data that it has gathered in China because these data sets are classified as being strategic or sensitive by the authorities (Wallace 2020; D'Hooghe et al. 2018; Slegers 2020; Joske 2018).

For the other dilemmas described above, proportionality and informed decision-making are both key. The amount of due diligence carried out, and the measures taken, should be proportionate to the risks or problems, the scope and character of the collaboration, and the nature of the cooperation partner that the project involves. Decisions on what is proportionate should be made by a group of people with different responsibilities and based on information from multiple sources. Building trust and confidence within an HE&R institution, as well as between institutions, is crucial in dealing with some of the other dilemmas. Different stakeholders within an institution should trust each other, working towards the same goals and aligning around the same integrity standards. This calls for open communication and joint discussions within the institution and across the sector. In this respect, the creation of guidelines by German and UK associations of universities is a very promising step.

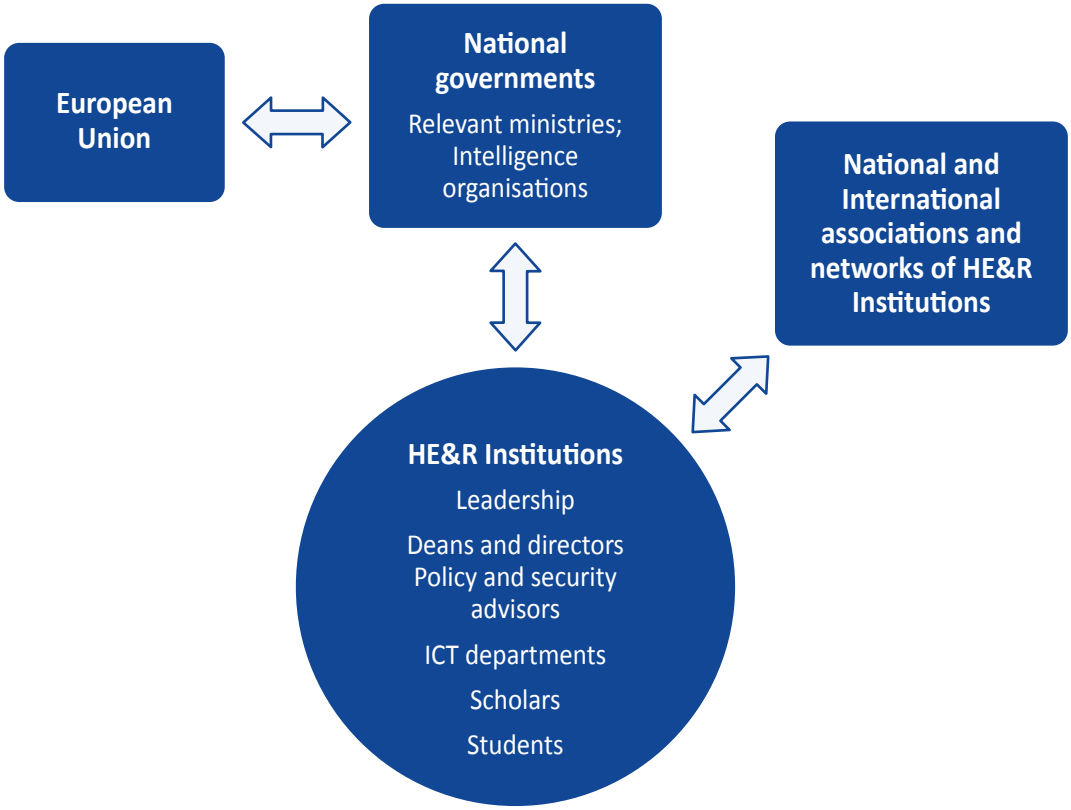


Fig. 1 Stakeholders in developing and implementing measures; authors.

Who needs to be involved?

Strengthening knowledge security and academic integrity involves a variety of stakeholders at various levels (Figure 1). At the level of HE&R institutions, these stakeholders include the institutional leadership, senior policy and security advisors, deans and heads of departments or research groups, research officers, ICT departments, legal experts, individual scholars, and students. At the national level, the encouragement or support of relevant ministries and intelligence agencies is crucial. Furthermore, national and international organizations or groups of HE&R institutions can provide important input for developing and implementing approaches to manage risks by sharing information and best practices. The combining and integrating of expertise, both within and between organizations, is an important challenge that relies on an effective coordinating party. National approaches may also be supported by joint European monitoring of risks and the sharing of information and best practices.

The role of the government and the issue of autonomy

The five sets of guidelines examined, as well as the interlocutors consulted for this report, all recognize the autonomy of HE&R institutions. At the same time, many also note important roles for the government. They particularly highlight the role governments can play in both pushing and facilitating the development and implementation of guidelines by institutions. If we look at the development processes of the existing guidelines, it is significant that in the majority of cases the government has been involved. The development of the Australian guidelines was initiated by the Australian government. These guidelines were developed by a steering group in which stakeholders from both the government and HE&R institutions were represented. This therefore offers an example of successful and fruitful collaboration between the government and HE&R sectors. The UK Guidelines were developed by Universities UK (UUK), an association of 140 UK universities. This association developed the guidelines at the request of the UK Minister of State for Universities and in coordination and cooperation with the government. This is illustrated by the alignment of the UK guidelines with various government initiatives, such as the 'Trusted Research' initiative that offers an array of complementary guidelines and tools. The Dutch guidelines were developed by an independent think tank, with input from academia. However, here too, it was the government that commissioned the project.

The Swedish and German guidelines were developed at the initiative of non-governmental stakeholders. The Swedish document was drawn up by the Swedish Foundation for International Cooperation in Research and Higher Education without government involvement. The German document was developed by the German Rectors' Conference, which represents 268 German universities. The German Rectors' Conference considered it better to take up the task themselves than to have government organizations do so (Interview 1-10). It felt that this was necessary because of the 'increasing state influence on the curricula and

processes at Chinese universities and growing curtailment of academic freedom' (HRK 2020). It saw these things to be 'hampering cooperation, and in some cases bringing it to a complete standstill' (HRK 2020). In Germany, the Federal Ministry of Education has no competence in this area. Universities are the responsibility of the federal states, so it would also have been difficult for the national government to produce guidelines on academic collaboration.

None of the sets of guidelines are prescriptive. They all aim to stimulate and support HE&R institutions in developing their own frameworks. As a result, four of the five sets of guidelines take the form of questions. The questions in the Australian, Dutch, and German guidelines are written in such a way as to steer institutions towards concrete objectives. Meanwhile, the questions in the Swedish guidelines are designed more to initiate and inform discussion. The UK guidelines are the most imperative in tone. These urge stakeholders to apply the recommendations they put forward.

Many of the interlocutors consulted for this report from different universities said that they felt institutional autonomy did not preclude cooperation with the government. They pointed out that in the process of developing an approach to sustainable collaboration, it is in the interest of the institution to cooperate, or at least coordinate, with government organizations. This can prevent a mismatch between the approaches, expectations, and needs of the institution and the government. Furthermore, government organizations can provide overall support and advice. They can advise, for example, on compliance with national or European legislation, due diligence, IPR issues, safe and unsafe areas of cooperation with China, and information about the agenda and background of Chinese institutions. The interlocutors emphasized that in order to have successful collaboration between HE&R institutions and the government, there should be a clear division of tasks and responsibilities and that the government should speak with one voice (Reference groups a and b, multiple interviews).

Various European governments have already taken initiatives to raise awareness about and provide support to academia with regard to compliance issues. They have published manuals for academia on export control regulations (e.g. BAFA 2019), Dutch government n.d.) and have organised seminars on the topic, such as those organised by the Dutch Ministry of Foreign Affairs for example. Another area where various European governments increasingly provide active support to academia is compliance with rules regarding access by international students and scholars to sensitive areas of studies. Several European governments have developed practical websites with Q&As and manuals (e.g. UK ATAS n.d.), Dutch Government n.d.). These help scholars with processes and contribute to reducing the amount of time needed to get collaborative projects approved.

China specific or country neutral?

A first step towards developing approaches towards sustainable collaboration with China is making decisions about the goals and scope of the approach. One important question to be

answered at this stage is whether the approach should be China specific or country neutral. Of the five sets of European guidelines that were examined for this report, only the German and Dutch documents are China specific. In the German case, the China specific guidelines aim to complement the organization's country neutral guidelines (HRK 2020b). They do this by setting out 'the necessary and optional courses of action specific to the cooperation with China'. This aim results in a China specific document that is far more extensive (18 pages) than the country neutral one (6 pages), underscoring the argument that a general document does not suffice to address specific aspects of collaboration with China. The Australian guidelines are also country neutral.

There are two reasons why many stakeholders prefer a country neutral approach. First of all, HE&R institutions face risks in collaboration with many countries, including Russia, Iran, Turkey, South Korea, and, according to some interlocutors, the US. Secondly, governments and HE&R institutions want to avoid provoking the Chinese government or Chinese partners. They also want to avoid claims of discrimination against China or Chinese scholars and students. However, various interlocutors involved in drawing up the above country neutral guidelines stated that challenges and incidents related to collaboration with China were important drivers for the development of the documents.

In conversations with stakeholders, a majority said they favoured a combined approach where country neutral guidelines were given alongside complementary guidelines on issues that are of specific relevance to one country, in this case China. These stakeholders believed that country neutral guidelines provided an important base, but that country specific information should underpin decision-making. Furthermore, they said that documents that lacked details and practical recommendations could easily end up in the drawer.

Goals and scope

There is no 'one size fits all' approach to designing a framework for sustainable collaboration. Guidelines have to fit into a research institute or university's overall approach to internationalization, as well as the regional or national context. Universities with extensive research collaboration with China may aim for a more comprehensive approach than universities that are mainly engaged in student exchanges with China. Technical universities may have to pay more attention to the risks of dual-use and espionage than universities involved in social science collaboration with China. For this reason, guidelines will always have to be adapted to the individual HE&R institution's context. Each HE&R institution will have to decide for itself about what kind of framework it wishes to use: whether it wants to implement an extensive framework that addresses all the elements involved in risk management as listed in Text Box 4, or whether it wants to focus only on specific elements. These decisions involve questions about financial and human resources and also questions about the commitment of the university leadership.

The existing guidelines can assist institutions in making these decisions. The Swedish guidelines may be helpful in starting a general conversation about sustainable collaboration with stakeholders within HE&R institutions, where this conversation has the aim of improving awareness. The Dutch guidelines offer a checklist with 10 questions that help stakeholders assess the risks and potential limitations of collaboration with China. These questions are supported by examples of incidents and challenges that provide a rationale for risk assessment. The Dutch guidelines also provide some information that is specifically targeted at Dutch stakeholders, discussing topics such as the role of Dutch intelligence services for example. However, the document is useful as a relatively brief and targeted tool for assessment and as an invitation for taking institutional measures. The German guidelines are explicitly targeted at German universities, but their questions are generic enough to provide inspiration to stakeholders in other European countries. These German guidelines are more detailed and guiding in character. Each group of questions is preceded by clearly formulated objectives. The German guidelines focus on academic integrity and offer little practical support with regard to the strengthening of knowledge security. However, they stand out in offering suggestions for strengthening collaboration in positive ways. For example, they encourage stakeholders to show mutual respect in collaboration with China. They also argue for improving the integration of Chinese students into the university community.

The Australian and UK guidelines provide the most comprehensive and detailed roadmaps towards strengthening knowledge security and academic integrity. In the UK guidelines, each theme is explained in detail and recommendations are supported by action points, cases, scenarios, 'lessons learned', or links to relevant sources and tools. Many of these tools are on the UK Trusted Research website. This website offers various 'Trusted Research Guidance' documents. It also has practical tools, such as the 'Countries and Conferences Guide', which explains how to ensure knowledge security when travelling abroad (Trusted Research n.d.). Another useful tool is the IP Toolkit of the UK Intellectual Property Office. This toolkit includes a 'Guidance Notes Supplement for Research Collaboration Agreements with Chinese Entities' that helps non-IP experts at research institutions handle issues relating to the ownership and exploitation of IP rights that might emerge in UK-China joint projects (UK IPO 2015). Then there is also Cyber Essentials, a government backed scheme that supports organizations to protect themselves against the most common cyber-attacks (UK NCSC n.d.). The Australian guidelines similarly provide extensive guidance on the multiple elements involved in managing risks and making universities resilient against foreign interference. These Australian guidelines also provide many additional types of guidance, including descriptions of best practices, case studies, and a list of resources and guidance materials.

The German, UK, and Australian guidelines state that developments in international collaboration will be monitored and that the documents will be regularly updated. They also offer suggestions for more national and international cooperation on developing approaches to

sustainable collaboration in HE&R. The German Rectors' Conference offers support to its 268 member institutions by facilitating networking between interested parties. It suggests that institutions involve China centres at German universities, or that they contact the DAAD Center for International Academic Cooperation which offers consulting services. It also seeks to engage in dialogue with European partners on the guidelines. Both the UK and Australian guidelines encourage HE&R institutions to work together with a range of government, business, and civil society organizations

Creating opportunities

All the guidelines discussed in this chapter emphasize that they do not aim to reduce or limit collaboration. They recognize the importance of Sino-European HE&R collaboration and the achievements of collaborative projects. However, these current sets of guidelines are almost solely concerned with risks. The German guidelines are the only exception. Throughout the document, these guidelines draw attention to the ways in which European actors can 'proactively identify realms of possibility' (p. 5) and contribute to creating a more positive environment for collaboration with China.

As has been mentioned earlier in this report, guidelines can empower successful collaborations, encouraging and providing confidence to involved stakeholders by confirming their safety. Collaborative projects can also be encouraged and empowered by identifying or 'green listing' areas in which HE&R institutes can safely develop collaboration with China. Such an overview does not yet exist for research collaboration, but input and inspiration could be drawn from the recently published 'Green List' for EU-China Economic Relations' (Kratz et al. 2020). This list identifies areas of economic collaboration that do not pose security risks and do not need to be subject to scrutiny.

Promoting impact

As has been mentioned above, none of the five comprehensive European guidelines are prescriptive. This means that there are no guarantees that the discussions that they seek to foster are taking place, that the critical questions they hope to raise are being asked, and that the recommendations they propose are being followed. However, there are several ways in which guidelines can encourage stakeholders to take action and promote actual implementation.

First of all, it is easier for institutions to work with guidelines that provide detailed practical suggestions. One area in which clear guidance may contribute to action is the issue of governance and the assignment of responsibilities. Since addressing risk involves many stakeholders at different levels, it is helpful to suggest who should be responsible for implementing guidelines. Several of the sets of guidelines examined for this report underline the importance of transparent responsibilities and a clear assignment of tasks. However, it is only the

UK and Australian guidelines that take a clear stance on this. They state that the ultimate responsibility lies with the executive body and/or senior leadership team in an institution.

A second way of encouraging implementation is to clearly state the benefits for stakeholders. The UK and Australian guidelines emphasize the reputational and financial damage institutions could otherwise suffer. Furthermore, they draw attention to the risks that unsafe collaboration could pose to the success of their countries' national HE&R systems and national interests, as well as to security in general.

Thirdly, relevant organizations can increase the impact of guidelines by offering additional support during implementation. An example is the seminars that the Swedish Foundation for International Cooperation in Research and Higher Education (STINT) is developing in Sweden. These seminars will discuss the implementation of Swedish guidelines with targeted stakeholders (Interview 15-9). The German Rectors' Conference, responsible for the German guidelines, states in its documents that it aims to support universities in developing their own individual approaches. As mentioned above, the extensive and structured additional resources provided by the UK and Australian guidelines also help to increase the impact of these documents. These resources help stakeholders to easily find relevant information and support on specific topics.

As discussed in Chapter II, some universities in Europe have already implemented stricter guidelines for international collaboration in general or for collaboration with China in particular, or are in the process of developing an approach. In the Netherlands, some universities have indicated that they are making use of the Dutch guidelines (Reference group b). Meanwhile, in Australia at least five of the eight leading research universities say that they have implemented measures in response to the Australian guidelines (Lewis 2020). However, publishing guidelines and developing an approach is not enough. If universities want to achieve results, it will be essential for them to encourage and maybe even enforce compliance and transparency in collaboration with China (Lewis 2020, Reference group a).

Content areas: Addressing breaches of academic integrity

Academic integrity is a broad concept that includes the notions of academic freedom, research ethics, transparency, and the safeguarding of human rights in research. All elements relate to values that are inherent in Western academia, but that are not always respected in collaboration with China. It is therefore no surprise that addressing breaches of academic integrity is one of the central issues in all five sets of guidelines examined for this report. These guidelines all emphasize the importance of upholding academic values. The UK and German guidelines state that values are essential for the successes of their HE&R sectors. The Australian guidelines list safeguarding academic freedom and values as a primary principle. Meanwhile, the Dutch guidelines highlight the theme as one of three areas that need close attention. Finally, in the Swedish guidelines academic freedom is dealt with throughout the text.

Given the scope of this report, the questions raised and the suggestions provided about this issue by the five sets of guidelines are too numerous to be discussed in detail here. However, one issue merits attention. The German and Swedish guidelines invite stakeholders to think about a very relevant question. This is, how to act when academic freedom cannot be guaranteed in international collaboration? Regarding this question, the Swedish guidelines specifically recommend that actors consider the ways in which academic freedom is affected by how the funding of a project is organised.

In addition to their in-document elaboration on safeguarding academic freedom, several of the sets of guidelines refer to documents that are specifically focused on this area of academic integrity. Upholding high standards of research ethics is also addressed in most of the sets of guidelines. This issue is most extensively addressed in the UK, Australian, and Swedish guidelines. The Swedish guidelines also specifically raise the issue of ethics dumping: a practice where researchers from countries with strong ethical regulations conduct experiments and tests in countries with less strict regulations. The Swedish guidelines are therefore the only set of guidelines that pay particular attention not only to the ethical standards of international partners, but also to those of European researchers.

The use of civilian technologies for military purposes, in repressive practices, or for violations of human rights, is another serious concern that many of the sets of guidelines rightly address. Apart from the Dutch guidelines, all of the sets of guidelines devote considerable attention to this issue.

Apart from these sets of comprehensive guidelines, there are a rich variety of documents that provide guidance and recommendations with regard to specific aspects of upholding academic integrity in HE&R cooperation with China or other countries. An example is the code of conduct for HE&R institutions on resisting Chinese Government efforts to undermine academic freedom abroad, which was published by Human Rights Watch earlier in 2020 (HRW 2020). Other examples are the European Code of Conduct for Research Integrity (ALLEA 2017) and the Human Rights Consortium's model for a code of conduct for protecting of academic freedom in internationalisation (HRC 2020). The China Defence Universities Tracker, produced by the Australian Strategic Policy Institute (ASPI), provides recommendations for universities and government about preventing dual-use technology in collaborative projects with China (Joske 2019). Various guidelines link to more e-resources that can benefit stakeholders seeking to develop comprehensive approaches to sustainable HE&R collaboration with China.

Content areas: Addressing breaches of knowledge security

Protecting large institutions that have complex ICT-systems and thousands of students and scholars against unintended transfers of knowledge can be a challenging task for HE&R institutions. Breaches of knowledge security may be the result of theft of research output and data, espionage, and hacking. They may occur online, via cyber-attacks, or in-person. They also

may take place at the institution or when researchers are travelling abroad. Such breaches of knowledge security often occur gradually, over long periods of time, without being noticed by colleagues within the institution. Most institutions recognize that knowledge-based assets are an important source of competitive advantage and that unintended loss might harm the institution not just financially but also in terms of reputation and competitive research position. They also recognise that such loss may harm European companies or national security interests (interviews 21-9, 30-9).

Of the five sets of guidelines examined, only the UK and Dutch guidelines deal with the tasks involved in strengthening knowledge security. The Dutch guidelines pay attention to data management and digital security. They call for collaboration with the national intelligence services. The UK and Australian guidelines offer the most extensive recommendations about this issue. The Australian guidelines view cyber security as not only a 'hard security' issue, but also an 'essential enabler of academic freedom'. These Australian guidelines deal with cyber security as 'a whole-of-organisation "human" issue'. They recommend building a positive security culture involving students, staff, researchers, and executives. The UK guidelines include practical measures. They advise researchers, for example, not to hold all data and information about an area of research or a project in one place but to store them in separate parts. They also advise researchers to strengthen control over access to data and laboratories. An interlocutor illustrated the usefulness of this latter measure. He described how a European university that conducted research into the accessibility of labs, computers, and data, found that they were easily accessible to outsiders and that there was much improvement necessary (interview 21-9). The UK guidelines present scenarios to explain how cyber security may be compromised and discuss lessons that were learned from these scenarios. The UK and Australian guidelines recommend that universities work together with the government and use government websites and toolkits. In terms of such toolkits, for example, the UK offers Cyber Essentials, a government backed scheme that supports organizations to protect themselves against the most common cyber-attacks (UK NCSC n.d.). It also provides the Cyber Security Information Sharing Partnership. The Australian guidelines also call for the sharing of cyber intelligence with the government and other sectors, as well as between universities.

Building China knowledge

The 2018 LeidenAsiaCentre study on Europe-China Collaboration in HE&R made a strong case for expanding and deepening knowledge about China, China's HE&R system, and the Chinese language. The China-focused guidelines discussed in this chapter also call for more expertise about China. In order to achieve the goals set out in these sets of guidelines, HE&R institutions need more in-depth expertise on China and more basic knowledge about China among staff,

scholars, and students across disciplines and departments. China experts can help institutions to make informed decisions. A general understanding about China among the broader university community will facilitate the management of potential risks and contribute to more fruitful and sustainable collaboration with China.

Several of the European governments discussed in this report have already taken steps towards developing more China expertise and greater China knowledge in their societies. The German government has developed a policy aimed at expanding and strengthening 'China competence' at German universities and reigniting the dwindling interest in China among students and scholars (BMBF n.d.). The Dutch government is currently developing a China knowledge network that spans ministries and HE&R sectors. This network aims to build China expertise in policy relevant areas, including providing support to HE&R sectors in developing more sustainable collaboration with China. In Sweden, the government has indicated that it will begin to work on establishing a national knowledge centre on China. This centre has the aims of better pooling and using China expertise, as well as investing in the building up of such knowledge throughout society (Swedish government 2019). Such initiatives will be essential in providing the European HE&R sector with the necessary expertise to overcome risks involved in collaboration with China.

Conclusion

In the past two years, an avalanche of policy documents and guidelines aimed at making international collaboration more sustainable have seen the light. This results in a noodle bowl of approaches and recommendations. This is illustrative of the growing awareness of the importance of addressing issues pertaining to knowledge security and academic integrity in international collaboration. European stakeholders, both at the level of HE&R institutions and the government, can draw upon these existing guidelines when developing their own models for sustainable HE&R collaboration with China. Developing or strengthening existing measures is an important task for institutions for two reasons. Firstly, it will help stakeholders to mitigate a variety of serious risks and will force them to think and act strategically with regard to developing partnerships with China. Secondly, but of equal importance, it will provide confidence to stakeholders when they engage in safe collaborative projects with Chinese counterparts. Transparency is a key word here. So long as institutions are unable or unwilling to show that their joint projects with China are developed and executed in accordance with the principles of academic integrity and regulations for knowledge security, their collaborations with China will continue to raise suspicions.

This chapter has discussed important aspects that need to be considered when institutions seek to develop joint projects with China. This discussion has been based on the approaches detailed in the five sets of comprehensive guidelines examined for this report. First

of all, developing an approach towards sustainable collaboration with China is a complex and daunting task that is best done in cooperation with others. Many universities in Europe lack the necessary capacity, knowledge, and financial means to develop and implement measures, or lack a sense of urgency. Working together with other HE&R institutions and government organizations broadens access to resources, best practices, and practical support. This can also create trust and solidarity between institutions, which may contribute to the acceptance of measures.

National governments have an important role to play, both as a motivator and supporter of the development of guidelines by HE&R institutions. Cooperation with the government will help government actors to better understand the needs and concerns of the HE&R sector with regard to international collaboration. In addition, it will ensure that HE&R institutions' guidelines do not run counter to government policies. The UK and Australian approaches illustrate that collaboration with government actors is beneficial to HE&R institutions and that it can be developed whilst still respecting universities' autonomy.

All the existing sets of guidelines contribute to the tasks of raising awareness and helping institutions to make international collaboration more sustainable. However, the UK and Australian approaches stand out. They are not only the most comprehensive and detailed guidelines, but they also offer cases and scenarios that contribute to insight into the scope and form of challenges. In addition, they provide practical recommendations and links to toolboxes and supporting government policies or instructions. Many interlocutors stated that very practical roadmaps and support in terms of knowledge about China's academic system is what they require most in order to address challenges.

The sets of guidelines discussed here could be strengthened by helping institutions to address the issue of proportionality. Some of the sets of guidelines do mention that measures should be proportionate to the risks, but they do not elaborate much on this issue. A framework for weighing up the risks and benefits of proposed projects could help stakeholders make sound decisions.

Last but not least, more attention should be devoted to the development of a strategic vision with regard to areas and formats of collaboration that are as beneficial to European stakeholders as they are to Chinese stakeholders. This entails identifying European or national strategic areas of research and identifying areas of safe cooperation, or 'green listing'.

Conclusions and recommendations

This report argues that European HE&R institutions need to develop approaches that help to make their collaboration with China more sustainable. They need to do so for multiple reasons:

The first reason is that developments in China force European institutions to take this step. The discussion of China's approach to education and science in Chapter I of this report demonstrated that, as a result of strategic policies and strong investments, China has transformed into a powerful and advanced player in HE&R and has become essential for European research and innovation. China's HE&R policies, including those in the area of internationalization, are primarily driven by its overall development needs and the country's aim of becoming self-sufficient in science and technology. This calls for the development of an equally strategic vision and more coordination on the European side. Chapter I and the Appendix to this report also show that the Chinese government is increasingly limiting academic freedom domestically. This goes directly against European academic values and therefore requires a strong awareness of potential limitations and robust measures to safeguard academic freedom in collaboration with China.

A second reason is that it is likely European HE&R institutions will continue to encounter challenges in their cooperation with China for some time to come. While it cannot be determined whether the increasing number of reports about breaches of knowledge security and academic integrity are the consequence of more assertiveness and misbehaviour on the Chinese side, or are the result of more scrutiny on the European side, or both, it is unlikely that the number of incidents will diminish in the near future. These breaches may seriously harm HE&R institutions in terms of their finances, their competitive positions in research, and their reputations. In addition, they can lead to human rights abuses and to the undermining of national economic and security interests.

A third reason is that Europe-China collaboration is taking place in an increasingly politicized and uneasy/complicated climate. Chapter II of this report demonstrated how growing political and economic tensions between European countries and China, as reflected in the increasingly critical European perceptions of Chinese policies and intentions, are spilling over into the sphere of HE&R cooperation. This further adds to the challenges confronting European HE&R institutions. It is a situation that demands a coherent approach and practical solutions. Scholars and institutions now do not only have to comply with complex national and European regulations on research collaboration. They also have to consider broader political and security aspects of collaboration and they have to respond to questions being raised by society. It is becoming more complex and troublesome to engage academically with China.

A fourth reason to invest in developing approaches to sustainable collaboration is that it has become more complicated and challenging to grasp opportunities for cooperation with China. As collaboration between Europe and China is of essential importance to both sides, the challenges should not stand in the way of developing sound and mutually beneficial joint projects. Pressure from the US on European stakeholders to take sides in their competition with China underscores the importance of European stakeholders developing their own approaches. Doing so can help to prevent them from becoming subject to, and victims of, geopolitical developments and can enable them to continue to grasp the opportunities of HE&R cooperation with China.

Chapters II and III of this report illustrated that awareness is growing about the challenges posed by collaboration between Europe and China. These chapters described how an increasing number of stakeholders are in the process of taking steps to manage risks and provide a better basis for that collaboration. Chapter III compared and analysed a selection of the sets of guidelines that stakeholders in HE&R have developed to this end. It was observed that the most comprehensive and inspiring approaches involved the cooperative effort of multiple stakeholders from both the HE&R sector and the government. More detailed findings from Chapter III have been translated into the recommendations provided below.

HE&R sectors across the globe are currently being seriously affected by the Covid-19 pandemic. This is also the case for international collaboration. It is not yet clear how the pandemic will impact Europe-China collaboration in the long term. The first figures for the registered incoming mobility of Chinese students to Europe do not seem to show a dramatic reduction for the academic year 2020-2021. However, it is not yet clear to what extent Chinese students have actually been able to enrol in person and to what extent they are studying online at European universities. In terms of research cooperation, both Europe and China are currently devoting much funding to Covid-19 related research. In this area, Europe-China collaboration is increasing. However, it should not be underestimated how research collaboration across all fields of science, and the initiation of new projects, may be negatively impacted by the lack of in-person exchanges of scholars and HE&R delegations, as well as by restrictions on the use of scientific equipment and facilities.

Recommendations

- HE&R institutions should invest in the development and implementation of an approach aimed at making collaboration with China sustainable; this means increasing awareness and understanding of Chinese HE&R institutions and their political ties, developing and implementing measures to safeguard academic integrity including academic freedom; strengthening knowledge security; and identifying opportunities for sustainable collaborative projects.

- Relevant government stakeholders should actively encourage and facilitate HE&R institutions in developing and implementing approaches to sustainable collaboration with China. In doing so, it is vital that the government speaks and acts with a single voice.

- Stakeholders from the HE&R sector and the government should consider establishing a joint coordinating entity at the national level.

- Stakeholders from the HE&R sector and the government should seek to make the development of an approach to sustainable collaboration with China cooperative and participatory. Here too it is important that the HE&R sector also speaks and acts with a single voice. Close coordination and learning between HE&R institutions and between the HE&R sector and government organizations is beneficial to all involved:
    - Institutions that lack the necessary capacity and knowledge related to China to take action, or lack the sense of urgency to do so, can be supported and encouraged by peer institutions and government organizations.
    - The alignment of guidelines with government policies contributes to compliance with measures and their overall effectiveness.
    - A shared commitment among institutions to design and respect guidelines creates mutual trust and solidarity, facilitating implementation and compliance.
    - A shared commitment by the HE&R sector and the government contributes to mutual trust and the government's understanding of the needs and concerns of the HE&R sector.

- Stakeholders should seek to develop an approach to sustainable collaboration with China that facilitates the management of risks and challenges, but also encourages the further development of safe collaboration with China. They should be transparent to all parties involved, including Chinese counterparts, and clarify which criteria inform the decision-making process.

- Governments and HE&R institutions should invest in developing knowledge on China in general, and on Chinese developments in HE and science and technology in particular, in order to better meet the challenges in HE&R collaboration with China.

- Stakeholders should seek to make the approach to sustainable collaboration with China provide more understanding and confidence to scholars and institutions with regard to engaging in joint projects with China, in accordance with European values and interests. Therefore, an approach at the institutional level:

    - Should be in proportion to the risks. The development of a framework for weighing benefits against the risks helps in this respect.
    - Should not only provide recommendations, but also include mechanisms that facilitate implementation, for example through allocating responsibilities and leadership for the tasks involved.
    - Should emphasize the benefits of implementing guidelines.
    - Should be facilitative in character by offering practical guidance, toolkits, active support, and opportunities to share and learn from past experiences and good/bad practices of peers.
    - Should be specific: scholars in specific fields of research need guidelines that are tailored to their needs, with a high level of specification based on expert knowledge.

- HE&R stakeholders in different EU member states should engage in closer cooperation. This strengthens the EU's own position in HE&R as well as its position vis-a-vis China.

Definitions

Within this report, various concepts and terms are used. These are defined as follows:

Foreign interference in HE&R refers to covert, coercive, deceptive and/or corrupting behaviour and activities by foreign actors that undermine the interests and values of another country or entity. It includes political influence and interference in HE&R, which refers to attempts by a foreign actor to influence the perceptions of staff, scholars and students at HE&R institutions with the aim of aligning research, education and the international academic debate with the strategic visions, opinions, interests or political system of a foreign actor, which are not supported by the receiving side and or are contrary to the receiving side's norms and values (D'Hooghe and Dekker 2020). Interference is sometimes described in terms of 'hybrid warfare' which entails employing a mixture of military force and intelligence, propaganda, and diplomatic means (d'Hooghe et al. 2018).

Academic integrity is defined as a moral code or ethical policy in HE&R. It refers to 'a commitment, even in the face of adversity, to six fundamental values: honesty, trust, fairness, respect, responsibility, and courage' (ICAI 2013).

Academic Freedom is defined as 'the right, without constriction by prescribed doctrine, to freedom of teaching and discussion, freedom in carrying out research and disseminating and publishing the results thereof, freedom to express freely their opinion about the institution or system in which they work, freedom from institutional censorship and freedom to participate in professional or representative academic bodies' (UNESCO 1997).

Appendix.

The international climate: incidents and geopolitical developments

The nature of the overall relationship between Europe and China has seen significant changes in the past few years, as is discussed in Chapter II. This development has in part been shaped by the US and China's determination to go down an increasingly confrontational road. On the Chinese side, Party Secretary and president Xi Jinping has overseen the Chinese Communist Party (CCP) strengthening its control over Chinese society domestically, moving away from Western-style liberalization in favour of a tightly controlled authoritarian system. Alongside this, recent years have also seen the unfolding of a more assertive China on the world stage. Although these developments would not have remained unanswered even if Donald Trump had not been elected in the US, his presidency has intensified the growing tensions. The Trump administration has presented China's rise as a threat to the international position of the US. In its attempts to counter this rise, this administration has initiated a trade war, sharply criticized China's foreign policy, and gone after Chinese global tech companies for what it claims are reasons of national security. In his confrontational approach to China, Trump demands his allies choose a side and align with the US. This approach from the US, and the coercive and assertive policies that China has adopted at home and abroad, including the persecution of Uighurs, the repression of the Hong Kong pro-democracy movement, and military activities in the South China Sea, has forced America's allies to speak out, although some have heeded to the call more wholeheartedly than others.

The increasing tensions between China and the West have spilled over into the international HE&R sector and have affected collaboration in this field between Europe and China. Distrust of the Chinese government and its international outreach has resulted in increased scrutiny of the Chinese actors who are active in Western academia. This, in turn, has been fuelled by developments and incidents in the HE&R sector which some regard as confirming their suspicion of Chinese intentions and activities. This appendix observes and describes the most important international developments that have shaped international HE&R collaboration with China in recent years, aided by illustrative examples. In an effort to give an overview, these developments have been divided into categories. Most issues, however, are closely related with one another and cannot be neatly placed under one label. The focus of this appendix is on developments that are relevant for European HE&R institutions and policymakers, something that makes the discussion here very Western-centric. Many of the developments that have unfolded in Europe are also discussed in Chapter II of this report. That chapter also analyses the way in which HE&R institutions and policymakers in Europe have responded to these issues.

Although the increased tensions between the West and China currently form the dominant lens through which international relations with China, including collaboration in HE&R, are being assessed, it is important to not allow this narrative to blind us from other parts of the picture. Many actors in the West and around the world cooperate very successfully and in good

faith with Chinese partners in the field of HE&R, producing crucial knowledge and technologies. Scholars, students, and policymakers have also been critical of the scrutiny of everything Chinese in academia and warn against 'Sinophobia'. Furthermore, information is sometimes being 'spinned' to make it fit with the narratives of hawkish actors in both China and the West. This underlines the gravity of approaching this topic as an unbiased observer, even if this risks being labelled as 'naive'.

Academic freedom and political influence

A prominent issue, and one that is illustrative of the way increasing political tensions are spilling over into international HE&R cooperation with China, is the growing concern about international academic freedom being undermined through Chinese political influence efforts. Although such concerns are not new, they have intensified in recent years, with a series of publications and incidents drawing attention to the issue.

In 2018, a US think tank published a report on Chinese political influence and interference in American higher education. The report concluded that officials from China infringed on the academic freedom of university students and staff by, among other things, complaining about events and speakers and pressuring academics who worked on sensitive topics. According to the report, a small number of Chinese students also undermine academic freedom through practices such as demanding faculty members change sensitive teaching materials, interrupting and heckling critical discussions about China, and pushing for the cancellation of academic activities that involve sensitive content. The author of the report stressed, however, that only a very small minority of Chinese students are involved in such practices, warning against generalizations. The author concluded that the 'evidence suggests a worrisome trend but does not in the author's judgement rise to the level of a PRC orchestrated wave' (Lloyd-Damnjanovic 2018). This level of nuance is not always found in similar reports.

The kind of undermining of academic freedom referred to in the above mentioned report was seen in an incident that occurred at a Canadian university. A group from the Chinese Students and Scholars Association (CSSA), which has branches around the world and has been reported to maintain close contacts with China's diplomatic missions, had its permission to operate on campus revoked after complaints that it had disrupted an event where a Uighur activist was speaking. Similar incidents have also been reported in other Western countries In some cases, governments have been called upon to take action in response, although there are also academics who argue that the incidents 'are blown out of proportion' to fit the current wave of 'Sinophobia' (Working Group on Chinese Influence Activities in the United States 2018; Sharma 2019d). Another thing that has fuelled concerns about Chinese influence at US campuses is the fact that many academic institutions have failed to report funding from China, resulting in government investigations at universities (Redden 2020b). So far in 2020, the US State Department has written multiple letters to leaders of HE&R institutions raising the issue of 'malign influence' of Chinese actors within the sector (US Department of State 2020a; US Department of State 2020b).

In Australia and New Zealand, concerns about Chinese political influence on campuses have been sparked by clashes between supporters of Hong Kong independence and pro-Beijing students. These incidents have drawn attention to the potential links between these pro-Beijing students and the Chinese government (Odysseus Patrick and Stoakes 2019; SCMP 2019a). In Europe, after a series of incidents occurred, a member of the European Parliament asked the European Commission how it planned to limit China's influence at universities in Europe (European Parliament 2020). One such incident took place at Prague's Charles University, which saw a scandal involving secret payments to its Czech-Chinese Centre by the Chinese embassy, fuelling concerns that the centre was being used by Beijing to increase its influence in Czech academia. As a result of the incident, the university closed the centre and fired some of the involved faculty members (Lazarová 2019). The Free University of Berlin faced criticism when it emerged that, in exchange for funds from Beijing in order to establish a Chinese teacher program, the university had signed a contract forcing it to abide by Chinese law. Critics said this would give the Chinese government leverage when it came to teaching about sensitive issues (Matthews 2020). The London School of Economics suspended its plan for a China program after academics criticized the fact that the proposed program was to be funded by an outspoken defender of Chinese government policies (Riordan 2019).

Such concerns have not only resulted in critical questions within the European Parliament, but also attracted attention in national political spheres. In the UK, for example, a House of Commons committee published a report in which it stated that it had 'heard alarming evidence about the extent of Chinese influence on the campuses of UK universities' (House of Commons Foreign Affairs Committee 2019). In the Netherlands, a report concluded that the Chinese government wielded political influence on Dutch campuses. The report said the Chinese government exerted such influence primarily by (directly and indirectly) pressuring scholars, students, and publishers into self-censorship, but also by limiting the research opportunities of scholars and through censoring publications (d'Hooghe and Dekker 2020).

Censorship activities have also impacted academic publishers. Dutch academic publisher Brill, for example, ended its relationship with the Beijing-based Higher Education Press after an article was removed by censors in China from one of its journals (Redden 2019b). A 2018 paper also revealed extensive self-censorship among China scholars, stating that of over 550 scholars from Europe, Hong Kong, Australia and North America, 70% agreed that self-censorship is a problem within their field. Being denied access to certain archival materials is another important problem, according to the respondents (Chestnut Greitens and Truex 2018).

Confucius Institutes

The issue of Confucius Institutes presents a special case with regard to concerns surrounding the undermining of academic freedom through Chinese political influencing. The Confucius Institutes are centres for the promotion of China's culture and language, funded by the Chinese government and located at hundreds of host universities all over the world. They have faced increased scrutiny in the US as well as elsewhere, and centres at institutions in Europe and

Australia have also been closed or had their contracts rewritten amidst claims of espionage and political influencing.

A 2019 US report raised concerns about academic freedom, pointing to the Chinese government's control over Hanban, which was the Chinese organization directing Confucius Institutes at that time (Redden 2020a). In some cases, US universities have agreed contractually that both US and Chinese laws apply to the institute on their campus. The report also criticized a lack of transparency from the side of the Chinese government (US Government Accountability Office 2019). In August 2020, the US State Department announced that it was designating the organization coordinating the language and cultural programs of Confucius Institutes in the US as a 'foreign mission' of China, forcing it to provide regular reports about operations, personnel, and funding. The announcement stated that this recognized the coordinating centre for what it is: 'an entity advancing Beijing's global propaganda and malign influence campaign on US campuses' (Redden 2020a; Pompeo 2020). About 54 Confucius Institutes have currently closed or are in the process of closing in the US (National Association of Scholars 2020). Some universities cite Washington's security concerns as a motivation, while an act banning the Defense Department from funding Chinese language programs at universities with a Confucius Institute is another reason for closing the institutes (Redden 2019d).

Confucius Institutes in Australia are also facing increased scrutiny. In 2019, a probe was started to investigate whether the institutes should register as sources of foreign influence, in line with the government's foreign influence transparency scheme (Karp 2019). Two Australian universities renegotiated their contracts with the institutes in order to safeguard their teaching autonomy (Hunter 2020).

In Europe, several institutions decided not to extend contracts with the Confucius Institute located on their campuses, while Sweden became the first European country to sever all such ties with Hanban (Lo 2020; Myklebust 2020; Welt 2020). Furthermore, politicians and officials in multiple European countries and beyond have raised concerns about the institutes, including those in the UK, Germany, and India. Meanwhile, the non-governmental organization Human Rights Watch has called upon higher education institutions to refrain from hosting Confucius Institutes (Conservative Party Human Rights Commission 2019; Spinrad 2020; Haidar and Jebaraj 2020; Human Rights Watch 2019).

In response to the increased scrutiny of Confucius Institutes, Beijing has transferred the governance of the centres from Hanban to a non-governmental organization (Peterson 2020). It is worth noting that despite the increased scrutiny, most hosting universities, including those in the West, do not currently feel that there are enough reasons to cut their ties with the Confucius Institutes. They continue to cooperate with Chinese partners in this way.

Security: Dual use, military ties and espionage

The security concerns that have been raised with regard to HE&R collaboration with China are another illustration of the spillover from increasing political tensions into the HE&R sphere. These concerns relate to several issues, including the transfer of dual-use technology, the military ties

of Chinese HE&R partners, and espionage practices. There have been some prominent incidents and publications that offer examples of the growing concerns among policymakers and universities.

An influential 2018 Australian report, which has set much of the debate in motion, stated that in the past decade over 2500 military engineers and scientists have been sponsored by the Chinese People's Liberation Army (PLA) to study abroad. According to the report, this is often without Western universities and governments being aware of the related security concerns, partly the result of Chinese efforts to obscure the military ties of such scholars. The report called upon governments to develop clear policies in this regard and to explore methods to limit the transfer of sensitive technology to China (Joske 2018). In 2019, a related 'China Defence Universities Tracker' was launched by the organization behind the report, after receiving funding from the US State Department. This online tracker provides a list of Chinese institutions that are engaged in security or military related science and technology research (Australian Strategic Policy Institute 2019). The publication of the report and launch of the tracker resulted in concerns in many countries with regard to potential links that scholars and students at their universities might have with the PLA.

The US government responded by introducing visa restrictions for Chinese researchers and students that have links with the military (White House 2020). A special Australian government taskforce developed guidelines to protect Australian academia from foreign interference. According to *Nature*, the establishment of this taskforce is widely believed to be a response to concerns about the ties between China's military and universities (Lewis 2020). Prior to the publication of the guidelines, a series of incidents had occurred, including a large-scale cyber-attack on a university. The guidelines advise universities to implement strategies to address concerns of foreign interference (Nogrady 2019 and University Foreign Interference Task Force 2019).

Apart from concerns relating to the Chinese military, Western universities and researchers have also been connected with the development of technologies that may be used by the Chinese government for repressive ends. In 2019, it was reported that New Zealand's Massey University had been working together with a Chinese tech company which was blacklisted by the US because of its involvement in the persecution of Uighurs. This resulted in academics urging universities across New Zealand to scrutinize their funding partnerships (Sachdeva 2019). A similar case occurred in Australia, where local media linked Australian universities to human rights abuses in Xinjiang (McNeill et al. 2019). In 2019, the *New York Times* reported that a professor at Yale University had unknowingly contributed to the repression of Uighurs in China (Wee 2019).

In certain cases, (dual-use) technology has reportedly been acquired by Chinese actors through improper means, sometimes involving various forms of espionage. As a result, universities in the US have come under increased pressure from the White House, members of Congress, the FBI, and federal science agencies to counter Chinese efforts to steal valuable intellectual property (Redden 2019c). This issue is especially high on the agenda in the US after a series of incidents. In 2019, for example, the *Wall Street Journal* reported that Chinese hackers

had attempted to hack over 20 universities around the world as part of an organized scheme to steal maritime technology research developed for military use (Volz 2019). A number of other incidents in the summer of 2020 resulted in the US Department of Justice announcing multiple criminal actions against Chinese scholars at US universities on charges ranging from undisclosed ties to the Chinese government to passport fraud (Marklein 2020). After this, the Trump administration then also considered further restrictions on Chinese students (Zheng 2020).

The issue of intellectual property theft is also on the agenda within the European Union. A recent European Commission concept note, produced in response to the conclusions of a meeting on research and innovation cooperation with China which called for the establishment of guidelines to address foreign interference, stated that one of the goals of such guidelines is to 'protect our key research findings and intellectual assets' (European Commission 2020). Meanwhile, China has also accused others of espionage practices within the academic sphere. It arrested a Japanese scholar and a Chinese-born academic from Japan on such charges in separate cases (SCMP 2019; SCMP 2020).

In August 2020, another Australian report drew attention to China's talent recruitment programs, including the Ten Thousand Talents Plan. The report connected these programs with issues such as intellectual property theft, espionage, and human rights abuses and criticized their lack of transparency. The report called for closer scrutinization of China's recruitment programs (Joske 2020). Not long after its publication, Australian politicians called upon the government to investigate such programs, as well as other issues related to potential foreign interference in Australia's academia (Hurst 2020). The Australian government also announced in August 2020 that it will introduce legislation that allows it to cancel academic agreements between local universities and foreign institutions (Murphy and Hurst 2020).

A special case in the discussion surrounding security concerns in HE&R cooperation with China is that of Huawei. The global tech giant has been heavily criticized by the Trump administration, which claims that it works closely with the Chinese authorities and facilitates espionage practices, including the theft of intellectual property. Under pressure from the government, several top universities in the US have begun to review their research ties with Huawei, and some have decided to ban future research collaboration with the company. Oxford University also stated that it was going to suspend new research funding from Huawei (Sharma 2019f). Scrutiny of the ties between other UK universities and Huawei has also increased. Many of these universities are, however, still collaborating with Huawei on research projects at present (Sharma 2020c).

Meanwhile, India presents an example of a non-Western country where political tensions with China have also spilled over into the sphere of HE&R collaboration. Following the example of the United States, its government has decided that visas for Chinese academics will require security clearance. The Indian authorities are also reviewing over 50 memorandums of understanding that educational institutions signed with Chinese partners (Sen 2020).

The Hong Kong protests and the National Security Law

Students, academics, and universities have played a significant role in protests in Hong Kong to prevent closer integration of the Special Administrative Region's political system with that of mainland China. A survey conducted by academics from four different universities in Hong Kong found that the majority of protesters were young and university educated (Redden 2019a). Some campuses served as protest strongholds, which resulted in violent clashes with authorities (Perper 2019). The protests resulted in tensions between (mostly Mainland Chinese) students who backed the authorities and students who supported the movement, both on campuses in Hong Kong, as well as overseas in places such as the United Kingdom, Taiwan, and Canada (Sharma 2019d; Power 2019; BBC 2019; SCMP 2019a).

In Australia, one university suspended a student activist after he called for democracy in Hong Kong and criticized Chinese influence at the university. Although the student conceded that his tactics were not innocent, and the university argued that the penalty was not based on his 'personal or political views about China or Hong Kong', the case raised questions about China-related censorship and political influence at foreign higher education institutions and particularly at the university in question (Australian Associated Press 2020). Along with students, many academics were also involved in the Hong Kong democracy movement. The University of Hong Kong received an open letter signed by 500 scholars that called for the protection of an activist associate professor from 'politically motivated dismissal or other disciplinary measures' (Redden 2019a). A group of activist scholars also stated that 2019 had been the worst year ever for academic freedom in Hong Kong. They stated that controlling higher education was a priority area in Beijing's attempts to increase authoritarian control in Hong Kong (Sharma 2019g).

These concerns have only increased since the introduction of the National Security Law in the summer of 2020. This law has far reaching consequences for Hong Kong and its HE&R sector. One problematic aspect of the law is the broad terms it uses to describe offences (Amnesty International 2020; Taylor and Xinqi 2020). Leading legal experts and scholars have warned that such vagueness will result in self-censorship practices, which might actually have been one of the aims of this approach (Lau 2020). Since the law was introduced, staff at higher education institutions in Hong Kong have been warned to be careful about how they teach by their own administrators (AFP 2020). Hong Kong officials have also ordered that school and public libraries remove and review certain books that could violate the law, and critics fear that university libraries might also be targeted (Chan 2020). Amnesty International has noted that freedom of expression on campuses has been restricted (Amnesty International 2020). Pro-Beijing figures in Hong Kong have proposed to install cameras in classrooms to monitor what is being taught in classes (Taylor and Xinqi 2020). In July 2020, Hong Kong University sacked the activist associate professor who was the subject of the above-mentioned open letter signed by 500 scholars. The professor believes this decision was made by authorities outside of the university. While universities have stressed that their policies have not changed because of the law, academics see this case as a harbinger of the law's potential impact (Leung and Sharma 2020).

It is also feared that the vaguely defined offence of 'collusion with foreign forces' could be applied to international academic collaborations (Qin and May 2020). Hong Kong academics are concerned about the law's implications for local institutions' international cooperation. It is feared, for example, that foreign universities will be more careful when inviting speakers from Hong Kong, as these speakers might be prosecuted under the new law for their comments. There are also concerns that local researchers participating in international collaborative research projects on topics that the Communist Party considers to be 'anti-China' could be subject to criminal charges (Leung and Sharma 2020).

Article 38 of the Hong Kong National Security Law has attracted particular attention from international scholars and legal experts. According to this article, the Law 'shall apply to offences under this Law committed against the Hong Kong Special Administrative Region from outside the Region by a person who is not a permanent resident of the Region' (Xinhua 2020). This essentially means that all the provisions of the Law apply to everyone everywhere on the planet. Therefore, if scholars in Europe criticize the PRC government, advocate for democracy in Hong Kong, or make other statements that could be interpreted as undermining national security, they violate the new law and could face prosecution when entering Hong Kong (Allen-Ebrahimian 2020). This has led scholars from around the world to release a joint statement criticizing the law (Ho 2020).

Article 38 can be seen as a new legal approach being taken by Beijing with the aim of curbing international criticism. According to a professor of Chinese law, the National Security Law's international reach is designed to scare China critics worldwide into practicing self-censorship (Clarke 2020). However, since the law has been implemented relatively recently, it is too early to tell in what ways and to what extent it will be put into practice. The main purpose of Article 38 seems to be to target members of the Hong Kong democracy movement. Leaders of this movement have been lobbying around the world for their cause (Allen-Ebrahimian 2020). Nonetheless, after the introduction of the law, universities in the UK requested that students submit papers related to China anonymously and not record any classes, to prevent retaliation by Chinese authorities under the new law (Wintour 2020).

Covid-19, financial overreliance and Sinophobia

Out of the many developments that shape international H&R cooperation, few will have an impact of similar scale to that of Covid-19. Although it is too early to conclude what the long term effects of the pandemic will be, it can be observed that international student mobility has, at least in the short term, dramatically decreased. This accelerates pre-existing trends regarding China's outgoing student population and might have serious consequences for academic institutions in the West.

Universities in certain countries had already been warned before the outbreak of Covid-19 that they were overly dependent on funds from tuition paying Chinese students. According to an article by *University World News,* which was published prior to the pandemic, about one-third of international students in the United States come from China. Meanwhile, in Australia 38% of international students are from China. In the UK 41% of non-EU students are Chinese. The

University World News article argued that, as a result of geopolitical developments and the improvement of China's domestic higher education, in the future fewer Chinese students might opt to study in some of these countries. In fact, the number of newly enrolled Chinese doctoral students in the US had already declined prior to the outbreak of the Coronavirus pandemic (Altbach 2019). Similarly, a 2019 report concluded that there was a significant slowdown in the growth in the number of Chinese students aiming to study in Canada, Australia, the United Kingdom, and the US. The authors of this report stated that while Canada and Australia were already diversifying their international student population, the UK and US were continuing to rely heavily on Chinese students to bring in funds. The report mentioned that the rise of less expensive study destinations in Asia and Europe, together with geopolitical developments, was responsible for this slowing growth (Chan et al. 2019).

Pre-Covid-19 concerns about an overreliance on Chinese students were especially large in Australia (Power 2019 and Babones 2019). Since the start of the pandemic, many more reports and articles have been published about how Covid-19 could affect the outflow of Chinese students in the coming period. However, these are primarily estimations and expectations. One report expects that the number of new Chinese student enrolments will drop steeply in 2020, as many delay their study plans, but that the value proposition of overseas education will then result in a recovery. It is expected that those students who are already enrolled will want to finish their courses (The Economist 2020).

Our interlocutors have indicated that the impact of Covid-19 on the enrolment of Chinese students at their institutions has so far been relatively limited (Interview 21-9). However, given the significant reliance among UK universities on tuition fees paid by Chinese students, a relatively small drop in enrolments could already have serious consequences for institutions there. Back in March 2020, *University World News* reported that an overdependence on Chinese funds had led to dramatic course cuts in Australia. This was when Chinese students were not allowed to travel due to Covid-19 related restrictions (Maslen 2020).

Another issue that has emerged as a result of the pandemic can be described as 'Sinophobia'. According to an Australian survey of anti-China racism, there has been an increase in racists attacks on Asian-Australians since the beginning of the outbreak (Koslowski 2020). In response to the increasing amount of discrimination, the Chinese government has advised its students to reconsider their study plans in Australia (Kuo and Murphy 2020). A research paper indicated that racist and anti-Chinese taunts increase support among Chinese students in the US for China's regime (Fan et al. 2020). Such findings will further fuel an already existing debate about the consequences of scrutinization of HE&R collaboration with China.

Australia is an example of a country where local academics have argued that the current climate in this regard is overly suspicious and harmful. In 2018, over 30 China scholars signed an open letter stating that they believe the Australian government's approach to China is a threat to intellectual freedom. The signatories criticized the debate about China's influence, saying that they saw in this 'the creation of a racialised narrative of a vast official Chinese conspiracy' (Concerned Scholars of China 2018). The initiative prompted other China scholars in Australia to write a counter letter in which they called the debate on CCP influence valuable and necessary

(Open Letter Respondents 2018). In 2020, scientists in Australia again criticized government policies aimed at tackling China's perceived influence at universities. They argued that these policies harm the academic autonomy of universities and they condemned what they call the groundless vilification of researchers who collaborate with Chinese partners (Hurst 2020). In July 2020, an Australian report was published highlighting the importance of continued science cooperation with China (Laurenceson and Zhou 2020).

In the US, institutions and academics have similarly opposed the approach to HE&R collaboration with China being taken by the Trump administration. A letter published by a coalition of HE&R organizations, for example, voiced concerns with regard to a proposed Senate bill. The coalition argued that this bill contains sections which are overly broad and potentially damaging to US science and international collaboration, without contributing to national security. A second letter raised concerns with regard to visa applicants who risk being denied access to the US as a result of decisions that are not based on actual violation of the law, but predominantly on suspicion of activity (Marklein 2020).

Conclusion

The political relations between China and many Western governments have turned sour amidst Chinese repressive policies at home and increasing assertiveness abroad, as well as an increasingly confrontational approach towards China by the Trump administration. These tensions have spilled over into the sphere of international HE&R collaboration with China. As a result, a range of issues have come up which are relevant to European actors in the field, and to which they have formulated, or should formulate, responses in the shape of updated policy approaches.

First of all, serious concern exists with regard to the undermining of academic freedom through Chinese influence efforts at campuses abroad. Secondly, security concerns have surfaced, which often relate to espionage practices, cooperation with Chinese companies such as Huawei, and the undisclosed application of knowledge produced by collaborative research projects for military or repressive purposes by Chinese actors. Thirdly, the Covid-19 pandemic has highlighted the financial reliance of certain institutions on the tuition fees of Chinese students. Finally, academics have also expressed concerns that the increased scrutinization of HE&R collaboration risks creates an environment that is harmful to uninvolved Chinese actors, to sound HE&R collaboration with China, and to Western societies themselves.

This last point is an important aspect of the discussion, as HE&R collaboration with China, be it in the shape of student exchanges or collaborative research projects, is of vital importance to the international HE&R sector, even in those countries in which China is criticized most severely. European policy makers and academics are therefore forced to perform a careful balancing act in order to, on the one hand, secure the continuation of collaboration with Chinese partners that is fruitful to both sides, and on the other hand also ensure that academic values, human rights, and the safety of people around the world are not undermined. Developing concrete approaches that help to realize sustainable HE&R cooperation is therefore crucial.

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