Inventory and analysis of needs for STARS EU Campus

Milestone 11

Table of Contents

Introduction

This study represents a milestone document prepared by Task 5.1 "Determine directions for STARS EU co-creation campus development," which is part of Work Package 5, known as "STARS EU Co-Creation Campus." The primary goal of this Work Package is to establish a physical and digital co-creation campus that fosters collaboration between academia, the working world, and the surrounding community, enabling collective creation of knowledge and development for regional transitions. The STARS EU Co-Creation Campus will serve as a creative and inspiring environment where stakeholders across different sectors can collaborate to drive research, education, and innovation in a way that enhances international cooperation.

Work Package 5 focuses on establishing a robust infrastructure that includes coordinating equipment, technologies, management, and services to ensure the effective operation of the co-creation campus. This includes promoting international collaboration in education, research, and regional transition through both physical and digital means.

The study is structured to provide a comprehensive overview of the development and current status of the STARS EU campuses. It begins with descriptions of the partner institutions and their respective campuses, followed by an analysis of hybrid teaching methods that support the digital campus. Additionally, the document presents lessons learned from other European University Alliances and offers recommendations for further development.

1 Campus descriptions of partner institutions

The diverse nature of STARS EU partner universities means that each campus reflects its own cultural and educational traditions, architectural style, and regional characteristics. This variety makes it difficult to provide a uniform description of the campuses. Therefore, a structural overview is provided instead, focusing on common elements across all universities. These descriptions offer insight into key aspects such as a brief historical note on each institution, its geographical location, and an overview of the student and staff population.

In addition, each description highlights the specific departments within the university and provides a detailed look at the physical layout of the campus, noting the unique characteristics of each site. Information on the universities' libraries, student housing options, and catering facilities are also included, providing a comprehensive view of how each campus supports both academic and student life. This approach allows for a better understanding of the distinctive features of each partner university while emphasizing the commonalities that unite them under the STARS EU network.

1.1 Hanze University of Applied Sciences

Hanze University of Applied Sciences (hereafter Hanze UAS) is the largest technical and vocational university in the northern Netherlands, located in the vibrant city of Groningen. Known for its strong emphasis on practical education and applied research, Hanze UAS offers a wide range of bachelor's and master's programmes in Dutch and English. The University is home to approximately 28,000 students and 3,200 employees, with approximately 8% of the student body being international.

Hanze UAS was established in 1986 through the merger of several local institutes for professional education. The oldest of these was the Academie Minerva, founded in 1798, which was the first intersectoral institute for practical higher education in the Netherlands. The name "Hanze" is derived from the Hanseatic League, a medieval commercial and defensive confederation of merchant guilds and market towns in Northwestern and Central Europe, of which Groningen was a member from 1282 to 1669.

Hanze UAS offers a diverse array of programmes across multiple disciplines, which include: Arts and Culture, Business and Economics, Science and Engineering, Health and Sports. The University focuses on four main social assignments: Transition to a Healthy and Active Society, Energy Transition and Circularity, Digital Transformation, Strengthening a Liveable and Sustainable Northern Netherlands.

The Zernike Campus, named after scientist Frits Zernike (1888-1966) who received the Nobel Prize for Physics in 1953, is located on the northern edge of Groningen

and is easily accessible by bicycle and public transport. It began to take shape in the late 1960s. Initially, the campus was developed to house research and educational facilities for the natural sciences and engineering departments of the University of Groningen (RUG). Over time, the campus attracted knowledge-intensive companies and university spin-offs. The campus experienced significant growth when Hanze UAS established its presence on the site. This addition brought more life and activity to the campus, fostering an ecosystem of intensive public-private partnerships. The collaboration between knowledge institutions, numerous companies, and various facilities has been instrumental in shaping the profile of the campus.

The Zernike Campus is now recognised for its focus on energy, chemistry, life sciences, and big data. Some of the notable facilities on the campus include: Innolab Chemie Groningen, Zernike NanoLab Groningen, Energy Transition Centre (EnTranCe), Energy Academy Europe, Start-up City, Zernike Advanced Processing Facility. These facilities contribute to the campus's reputation as a centre for research and innovation, attracting students, researchers, and industry partners from all over the world.

The key Buildings of Hanze UAS are:
Van Olst Tower: This iconic building is one of the tallest on the Zernike Campus and houses various administrative offices and classrooms. It has a large atrium and is a central point for many students and staff.
Van DoorenVeste: This building is equipped with modern facilities, including lecture halls, seminar rooms, and study spaces. It also features a maker space which provides an open environment where students, regardless of their technical background, can experiment, build, and learn new skills.
Energy Transition Centre (EnTranCe): A recent cutting-edge facility dedicated to research and innovation in sustainable energy. EnTranCe provides a platform for students, researchers, and industry partners to work on projects related to energy transition and circular economy.
Sports Studies: This building was completed around 2010 and is designed to support the comprehensive Sport Studies programme. Among the facilities are classrooms, research centres and laboratories, sports halls and gyms and a swimming pool.
Wiebenga building: The Wiebenga building, near Groningen centre, was designed by Jan Gerko Wiebenga and completed in 1922. It is an early example of the New Objectivity architectural style. Originally used as a technical school, it now houses the School of Health Care Studies and the School of Nursing. The building has been renovated to meet modern standards.

Hanze UAS has several libraries and study spaces across its campuses. The main library on the Zernike campus provides a vast collection of books, journals and digital resources. There are also numerous quiet study areas, group workspaces and soundproof pods for focused study sessions. The campus boasts extensive sports facilities, including a gym, sports halls and outdoor pitches. Students can take part in a range of activities, from fitness classes to team sports. The sports centre also offers wellness programmes and physiotherapy services. There are several dining facilities on campus, including cafeterias, coffee bars and restaurants. These facilities offer a variety of meals

and snacks to suit different dietary preferences and needs. Student housing on campus has recently begun to develop. By the summer of 2024, a new building will be able to accommodate around 800 students. The campus includes health services such as counselling and medical care to support the physical and mental health of the university community. There are also quiet rooms for meditation and relaxation.

In addition to the main Zernike Campus, Hanze UAS has other facilities at various locations. Assen is home to the Hanze Institute of Technology, which focuses on high-tech engineering and applied research. Leeuwarden is home to the Pop Culture programme, with specialised facilities for music and performance arts. Amsterdam has a branch of the Dance Academy, which provides professional training in dance and choreography.

1.2 University of La Laguna

The University of La Laguna (hereafter ULL) is situated in San Cristóbal de La Laguna, on the island of Tenerife. The ULL has four main campuses (Central, Anchieta, Guajara and Ofra) in the municipality of La Laguna, along with several dispersed centres in Santa Cruz de Tenerife and affiliated centres in Puerto de la Cruz and Adeje.

In 2024, the ULL will celebrate 232 years since it was founded in 1792, initially as the University of San Fernando by Royal Decree of King Carlos IV. Since then, it has become the leading institution of higher education in the Canary Islands and, until the establishment of the University of Las Palmas de Gran Canaria in 1989, the only public university in the archipelago.

For the 2023/24 academic year, the ULL has a total of 20,496 students, more than 87% of whom are enrolled in undergraduate courses. At postgraduate level, 6.88% of students are enrolled in master's programmes and 5.72% in doctoral programmes. However, the distribution by field of study is quite heterogeneous. Additionally, there are 1,621 lecturers, a slightly lower number than ten years ago, although the number has fluctuated considerably over the last ten years.

In terms of academic offerings, the ULL offers 47 undergraduate degrees (although the Naval Radioelectronics Engineering programme is being phased out), 38 official master's programmes, 21 doctoral programmes and 11 institutional degrees, of which 9 are postgraduate and 2 undergraduate. In addition, the ULL offers 6 postgraduate distance learning courses and 5 semi-distance learning courses.

Structurally, the institution comprises a total of 10 faculties, 3 university schools and 3 affiliated centres, distributed as follows:

Faculties: Faculty of Fine Arts; Faculty of Sciences; Faculty of Health Sciences; Faculty of Pharmacy; Faculty of Social Sciences and Communication; Faculty of Law; Faculty of Economics, Business and Tourism; Faculty of Education; Faculty of Humanities; Faculty of Psychology and Speech Therapy.

Schools: School of Doctoral and Postgraduate Studies, Polytechnic School of Engineering, Higher School of Engineering and Technology.

Affiliated Centres: Ntra. Sra. de la Candelaria School of Nursing, Tenerife School of Tourism, Iriarte School of Tourism.

In addition to these faculties, the ULL has the Rectorate building, which houses the central administrative services of the institution. The central university building, where the activities of the institution originally began, includes the University Assembly Hall (Paraninfo), which is equipped to host cultural events, official ceremonies and similar activities.

Each campus has an auditorium of variable size suitable for holding events and equipped the necessary audio-visual equipment. The University also has sports facilities, including a football field, a beach volleyball court, paddle tennis courts and even a gym, which is open to the university community.

The campuses are grouped according to areas of knowledge. The Anchieta Campus primarily houses faculties related to the natural sciences, while the Guajara Campus includes faculties of social sciences and humanities. The Central Campus is mainly focused on education-related degrees, and the Ofra Campus is home to the Health Sciences facilities.

Finally, the University has 14 libraries and several study rooms, some of which are open 24 hours a day. Almost every faculty has its own library, and there is also a general library on the Guajara Campus, with six floors of works from different disciplines, as well as rooms adapted for student study. The ULL offers a minimum of 300 accommodation places per academic year, distributed in three student residences and one university residence.

1.3 Polytechnic Institute of Bragança

The Polytechnic Institute of Bragança (hereafter IPB) completed 41 years on 28 January 2024, with the day of its creation being 1983. Since then, the institute has been consolidating its educational project by creating 6 schools: School of Agriculture (ESA - Escola Superior Agrária) in 1983; School of Education (ESE - Escola Superior de Educação) in 1984; School of Technology and Management (ESTiG - Escola Superior de Tecnologia e Gestão) in 1990; School of Communication, Administration and Tourism (EsACT - Escola Superior de Comunicação, Administração e Turismo) in 2008, which began in 1995 as a hub of ESTiG; School of Health (ESSa - Escola Superior de Saúde), integrated into the IPB in 2001; School of Hospitality and Wellness (EHB - Escola Superior de Hotelaria e Bem Estar) in 2021. In addition, the IPB will begin construction of a new building for the Health School in early 2025.

The IPB has campuses in three cities in the north-east of Portugal: Bragança, Mirandela and Chaves. The Bragança Campus, with 8,750 students and 840 teaching and non-teaching staff, is the largest and oldest (created in the 80s). This campus houses most of the infrastructures and services. The Mirandela Campus, located 60 km from Bragança, was built at the end of the 90's and houses the EsACT, a canteen and two

student residences (under construction). The Mirandela Campus has 1,500 students and 91 teaching and non-teaching staff.

As a result of the IPB's cooperation with the City Council of Chaves, the IPB's new campus is being developed in the city. This campus will house a joint laboratory, a student residence (one of four under construction), the EHB building with canteen (project under development) and sports and leisure facilities (project under development). The Chaves Campus is located just over 100 km from Bragança and has 250 students and 5 teaching and non-teaching facilities.

The IPB has been consolidating its research and innovation ecosystem, which integrates the following units: CIMO - Mountain Research Centre in 2002; CeDRI - Research Centre in Digitisation and Intelligent Robotics in 2018; CITED - Transdisciplinary Research Centre in Education and Development in 2024 (born as a natural evolution of the CIEB - Research Centre in Basic Education in 2018); UNIAG - Applied Management Research Unit (the result of a collaboration of 4 polytechnic institutes) in 2013; GICOS - Research Group in Sustainable Construction in 2024; LiveWell - Research Centre for Active Living and Wellbeing in 2024. Within the IPB research and innovation ecosystem and the national science and technology system, there is also the associated laboratory SusTEC - Sustainability and Technology in Interior Regions, and the collaborative laboratories MORE - Montanhas de Investigação and AQUAValor - Centre for Valorisation and Transfer of Water Technology (in Chaves).

The IPB's Central Services, permanent structures of a transversal nature that provide technical and administrative support for all the activities carried out in and by the IPB, are housed in a recently built building. They include the following structures: Technical and Administrative Services (academic services, human resources, accounting, procurement, shipping and archives, treasury, IT services and maintenance and conservation services), Technical Offices (support to the President, international relations office, quality, audit and control, works and construction planning and management, image and student support, entrepreneurship, project management and documentation and libraries) and General Support Services.

SAS - Serviços de Ação Social of the IPB are services dedicated to ensuring the functions of scholarly social action. Endowed with administrative and financial autonomy, they carry out the social action policies defined by the Government and the IPB bodies. They have their own administrative and financial services, without prejudice to the possibility of sharing the services of the Institute, with the aim of rationalising human and financial resources. The SAS have their own infrastructure, including a building for administrative staff, sports and accommodation facilities and 2 canteens.

The IPB has Documentation and Library Services that support teaching and research and aim to provide access to scientific, document and information resources. Open access scientific databases are available for research and inter-library loan. The libraries are integrated into each of the school buildings.

In terms of student accommodation, the IPB (through SAS) has 3 residences for underprivileged national students with a total capacity of 356 beds, as well

as 3 residences in the city centre for international mobility students and visiting professors and researchers with a total capacity of nearly 50 beds. There is also a residence for visiting professors with 6 rooms with a capacity for 12 people. The University has 4 new residences under construction, which will increase the number of beds available to students (another 502 beds) by the end of 2025: 1 in Bragança (200 beds), 2 in Mirandela (120+62 beds) and 1 in Chaves (120 beds).

The IPB (through SAS) sports infrastructure, including two football fields (natural and artificial grass), athletics facilities (with a tartan track, jump boxes and changing rooms) and facilities to support sports study cycles and the practice of sport throughout the community. Next to the current student residences, there is also a multi-purpose playing field, which allows for the practice of various sports in response to teaching, pedagogical and extracurricular activities.

The Institute has an outdoor auditorium with a capacity of 1,100 people. The infrastructure supports the activities of courses and study cycles in the field of art and artistic production, as well as shows and cultural activities organised by the academic community. In this auditorium, the IPB organises an annual welcome session for new national, international and mobility students. A Mentoring Academy is a pedagogical space (integrated in ESTiG and EsACT), duly equipped, within the framework of the Mentoring Academy programme, intended for pedagogical support, mentoring and tutorials, generation of ideas, creativity and promotion of pedagogical and training innovation. On the campus there is an Academic Building dedicated exclusively to hosting student organisations and their activities. The building has 10 offices, intended to house the headquarters of the Academic Association and several student associations, and common spaces, including a multipurpose room adapted for rehearsals of cultural groups ("tunas" and others), meetings and other events.

Lastly, the IPB also offers an interfaith space, designed to accommodate the religious practices of the IPB students of all faiths, and a clinical centre with medical and nursing offices. The African Students' Association has been given a three-room building as a result of a partnership with the Municipality of Bragança.

1.4 Bremen University of Applied Sciences

Hochschule Bremen - City University of Applied Sciences (hereafter HSB) in its current form was founded in 1982 through the merger of four universities: the University of Economics, the University of Technology, the University of Social Education and the University of Nautical Sciences. The oldest of the predecessor universities was founded in the 18th century, so the roots of the HSB go back to 1798/99. Today, the HSB has almost 9,000 students and offers around 70 degree programmes. These are distributed across five faculties: School of International Business; School of Architecture, Civil and Environmental Engineering; School of Social Sciences; School of Electrical Engineering and Computer Science; and School of Nature and Engineering. Many of the HSB's degree programmes are interdisciplinary, and the course of study is based on professional and practical cooperation within and between the faculties.

Important elements of the HSB's profile are its practical orientation and internationality. Thanks to close cooperation with the business world, students can often take part in practical semester projects during their studies, often in direct cooperation with the University's cooperation partners. Around 90 % of students write their final theses in cooperation with companies. There are also several dual degree programmes. In more than half of the programmes, stays abroad with practical and study semesters are an integral part of the course.

The University is spread over several locations, mostly close to the city centre in the Neustadt district of Bremen. The main campus, Campus Neustadt, is home to key components of the University such as the Rectorate, the Central Administration, the Computing Centre and the Centre for Teaching and Learning. In addition, facilities for several faculties, such as the School of Architecture, the Department of Civil and Environmental Engineering and the School of Social Sciences, are located on the campus. The School of International Business is located on the Campus Werderstrasse, while the School of Electrical Engineering and Computer Science and the School of Nature and Engineering are located on the Campus Airportstadt.

All locations are well connected by public transport and are easily accessible by bike. Cycling is one of the most popular means of transport among students and in the city as a whole. This means that distances between locations are short. The Studentenwerk Bremen (Student Union) runs canteens and cafeterias with a wide range of food at all three major locations. Furthermore, there are many other options for dining in the surrounding area.

Due to the different locations, the architecture of the buildings is very different: some are listed old buildings, others are modern new buildings. The University's tallest building is the AB building, a ten-storey high-rise on the main Campus Neustadt. On the top floor there are representative event rooms with a wonderful view of the Bremen skyline. All locations have functionally equipped seminar and event rooms in common. By providing quiet rooms, seating areas, and study and work facilities for students, the HSB strives to create a pleasant learning atmosphere and good conditions for studying and working. Due to the high degree of internationality, there is space and opportunities for cultural exchange in many places at the university.

As a special feature, the HSB shares a library with the University of Bremen. The main library is therefore located at the university at the other end of the city. However, two branch libraries are located on two of the HSB campuses: the branch library for technology and social sciences on the Campus Neustadt and the branch library for business and nautical sciences on the Campus Werderstrasse. Literature on other subjects can easily be ordered via interlibrary loan and collected from one of the branch libraries.

The University itself does not operate any student dormitories, but the student union currently offers more than 2,000 places for students. However, these are not only available to the HSB students, but also to students of the University of Bremen.

With its diverse profile, the HSB is oriented towards the current challenges facing society and the economy, which run through its studies and teaching as cross-cutting themes. These include digitalisation, energy, mobility, urban development, health and sustainability. In order to do justice to these topics in research, studies and teaching, the HSB has a large number of laboratories in which students can learn in a practical and solution-oriented manner. This applies in particular to the departments of Shipbuilding and Marine Technology, Nautical Science and Maritime Transport, Biology, Bionics, Electrical Engineering, Computer Science and Mechanical Engineering, as well as Nursing and Health, Architecture, Construction and Environment. Through expansion and modernisation, the HSB is constantly improving the range of services and the good conditions for learning and working.

1.5 Silesian University in Opava

The Silesian University in Opava (hereafter SUO) was officially established in 1991, when two faculties of the Masaryk University, which had been funded the year before, became independent: the Faculty of Philosophy and Natural Sciences in Opava and the Faculty of Business Administration in Karviná. Since the year of its foundation, the institution has expanded and now consists of three faculties and two institutes.

The SUO campus serves approximately 5,200 students and 630 academic and other staff members. The University's activities are carried out in two cities, Opava and Karviná, which are located 60 kilometres apart. This has a significant impact on the character of the campus, as both cities have to provide the University library, accommodation and sports activities for students.

Opava is home to the Rectorate and four other components: the Faculty of Philosophy and Science, the Faculty of Public Policies, the Mathematical Institute and the Institute of Physics. Approximately 3,000 students (58%) study and 470 employees (75%) work at the University in Opava. In Karviná, the School of Business Administration has about 2,200 students and 160 employees, representing 42% of all students and 25% of all employees of the Silesian University.

The SUO does not have a single campus in either of its base cities, which would bring together all functions, activities and services in one area. As a result of the conditions under which the University was established in the early 1990s and its subsequent development, the SUO has gradually acquired individual buildings scattered around the two cities. Each building dates from a different historical period, but they have in common that none of them was originally built for the needs of the University. As a result, all the buildings have had to undergo extensive reconstruction, usually in several stages, to make the internal layouts and equipment suitable for teaching, study and research activities.

In Opava, the SUO conducts classes in five historic buildings, each with a different architectural style from the late 19th and early 20th centuries. Various study programmes have specialised teaching spaces and laboratories in their respective buildings. In the field of the arts, students have access to film and sound editing rooms, theatre rehearsal and storage rooms, a cinema

hall, a theatre hall or photography studios. Health and social care students have access to a teaching apartment, an interview room, a Snozelen area, a nurses' station and a dental hygiene centre. The training apartment is equipped with a range of compensatory aids used for training work with people with special mobility needs. The interview room is used for teaching and training communication and psychological skills with a focus on pathological phenomena and crisis situations. The Snoezelen room is a therapeutic, support or leisure room which, thanks to its structured multi-sensory environment, promotes learning, perceptual development, activity support, relaxation, socialisation and communication for people with special needs, people from disadvantaged groups or also the elderly. For astrophysics students, the SUO offers access to an astronomical observatory equipped with a powerful telescope or a spherical immersive media studio known as Unisphere. Classes are also held in specialised laboratories for museology, foreign languages and computer science.

In Karviná, most of the teaching takes place in a building constructed in the late 1980s as the seat of the district committee of the Communist Party of Czechoslovakia. In addition to standard or computer classrooms, the building has a MediaLab classroom, classrooms for hybrid teaching, collaborative learning spaces and a representative large hall with a capacity of around 850 seats. The second building of the Business School in Karviná was originally built in the 1970s as a secondary mining school. This building houses a professional centre for tourism and classrooms for teaching foreign languages. Activities to promote cooperation between students and businesses are concentrated in the Business Gate building, which is not owned by the SUO, but by the City of Karviná.

An essential part of the SUO is the University Library, which is located in both Opava and Karviná. The collection of books and electronic information resources is tailored to the disciplines studied in each city. The library building in Opava was built in 2016, and the library in Karviná was completely reconstructed in 2009. The libraries offer suitable spaces for study, group work and a range of other library services. Furthermore, the SUO has buildings providing student accommodation. In Opava there are two buildings with a total capacity of about 350 beds. In Karviná, students are accommodated in a building that also houses a library, a gym and a training tourism centre. The accommodation capacity in Karviná is 440 beds. The University does not provide catering facilities for students and staff.

1.6 University West

University West (hereafter UW) was founded in 1990. Initially, UW had three campuses: in Trollhättan, Uddevalla and Vänersborg, but in 2008 all activities were moved to new facilities in Trollhättan. The University offers work-related education in a modern study environment with a profile in work-integrated learning (WIL), as it believes that knowledge and development are best created in the encounter between academia and the outside world.

The University offers 30 undergraduate courses and 20 postgraduate courses. With its 14,000 students and 750 employees, the institution has 4 departments/schools: School of Business, Economics and IT; Department of Social and Behavioural Studies;

Department of Health Sciences; Department of Engineering Sciences. The focus is on two areas of strength: Work Integrated Learning and Production Engineering, which have been established as full academic environments in 2022. Doctoral training in Production Engineering and Work-Integrated Learning is currently being studied by around 75 doctoral students. In addition, 86% of students are established in the labour market 1-1.5 years after graduation.

UW offers undergraduate and postgraduate programmes and courses in a wide range of areas including computing and IT, business and leadership, health and care, teaching and languages, media, people and society, and technology. UW provides work-based education and collaborates closely with society and business. Through the profile - Work Integrated Learning - students at the university gain experience of working life during their education. UW has a Government mission to develop the pedagogy around WIL. An example of WIL in education is Co-operative Education (Co-op), where study is interspersed with periods of paid work. Research is conducted in the fields of technology, social sciences, health and care sciences and the humanities. UW's priority research areas are Work Integrated Learning and Production Technology. The university has established the research environment Primus, which will develop strong research and education in technology and learning through the Knowledge Foundation's Knowledge Environment programme. Primus ultimately aims to strengthen Swedish industry. An important interdisciplinary research area is Work Integrated Learning. There is a strong link between research at the university and undergraduate education. UW is authorised to award doctoral degrees in production engineering and work-integrated learning.

Centrally located in Trollhättan, the campus is easily accessible and integrated into the city centre. It has been thoughtfully designed with the needs of students in mind, offering a range of facilities and spaces to support both academic and social life. The open spaces throughout the campus encourage interaction and provide numerous meeting points where students, teachers and even professionals can connect and collaborate. The key facilities of UW campus: Student bookstore; Student Health Services; Study counselling; Creative Centre, a place where students can test and develop creative elements within their education; Media Centre, where students can borrow equipment for working with various creative projects within the framework of our courses and programmes; Production Technology Center (PTC).

The University Library, also located on campus, is a natural meeting place and workplace for the University, offering a range of spaces from individual workstations with computers to group rooms, quiet reading rooms, resource rooms and more.

As for accommodation, UW provides housing specifically for international students and exchange students, with two main complexes available: Eidar Accommodation and Hammar Nordic Accommodation. These residences offer comfortable living spaces that are conveniently located for easy access to the campus and its facilities. In addition to the accommodation, the campus has a restaurant and a café, both of which cater for a wide range of dietary preferences and needs.

Campus plan 2030: The campus plan was approved by the University Board in December 2019 and is the result of collaboration between UW, the Student Union at UW, the City of Trollhättan, property owner Kraftstaden and the municipal housing company Eidar. Collaboration is a central theme in the development of the campus. Based on the campus plan, the aim is to create an environment where academia and working life meet and where students, staff, collaborators and the public want to be. The campus plan shows how the campus area can be integrated into the city centre and is in line with the City of Trollhättan's ambitions for the development of the city centre.

Campus vision: "A campus where meetings are created. The meeting between knowledge, ideas, cultures and people. Our campus is a creative and inspiring environment for lifelong learning and cross-border collaboration. Here, meetings are created between academia, working life and the surrounding society to create knowledge and development together. Our campus makes research and progress visible in an accessible and inclusive way. This is where you want to be and everyone feels welcome here."

1.7 Cracow University of Technology

The Cracow University of Technology (hereafter CUT) was founded in 1945. Along with its academic
and educational development, the University's infrastructure has also improved since its establishment. Today, the CUT is spread over two campuses with a total area of 110 hectares. The University currently has 14,000 students in full-time and part-time undergraduate, graduate, doctoral and postgraduate programmes and approximately 1,100 academic staff.

Structurally, the CUT comprises a total of 8 faculties: Faculty of Architecture, Faculty of Computer science and Telecommunications, Faculty of Electrical and Computer Engineering, Faculty of Civil Engineering, Faculty of Materials Engineering and Physics, Faculty of Environmental Engineering and Energy, Faculty of Chemical Engineering and Technology, Faculty of Mechanical Engineering. Each of the faculties houses specialised spaces, laboratories and equipment, e.g. Laboratory of Environmental Aerodynamics, which are crucial for the educational and research activities of the University. In addition, the University disposes of a Doctoral School at the CUT which was established for the academic year 2019/2020. Other units: Centre for Education and Organisation of Quality Maintenance Systems, International Centre of Education, Pedagogy and Psychology Centre, Sports and Recreation Centre, the CUT Library and Foreign Languages Centre.

Although the University was founded in the first half of the 20th century, many of its current buildings have played a significant historical role, influencing not only the city of Cracow but also the surrounding region. These buildings, in addition to being centres of learning, are deeply linked to the cultural and academic heritage of the city, reflecting the historical development of Cracow over time. The CUT main campus on Warszawska Street is located in the 19th century barracks built under the supervision of Antoni

Łuszczkiewicz. The complex, the largest of its kind in Cracow, was named after Archduke Rudolf, heir to the Austrian throne. The Austro-Hungarian army was stationed here until 1912; during the inter-war period the barracks were named after King Jan III Sobieski and the Polish army was based in the buildings. After the Second World War, the complex on Warszawska Street was given to the CUT. The former army headquarters building is now the seat of administration and the Faculty of Civil Engineering. The other historic buildings house the Faculties of Electrical and Computer Engineering, Environmental Engineering and Energy, and the Faculty of Architecture, as well as the University Library and Museum.

The CUT is a perfect example of combining history and the present. The Faculty of Architecture and the Faculty of Materials Engineering and Physics are located in the former royal palace in Łobzów. The palace was the oldest royal summer residence. Destroyed during the Swedish invasion, the residence was rebuilt by King Jan III Sobieski. After the Second World War, the palace in Łobzów became the property of the Cracow University of Technology and was included in the list of historical monuments in 1983. One of the institutes of the Faculty of Architecture and the Zależny Theatre are located in the Samuel Maciejowski Palace on Kanonicza Street. This 16th century building is a magnificent example of a combination of architectural of architectural styles - Renaissance, Baroque and 19th century Classicism with a Neo-Renaissance facade.

The CUT Student Housing Complex is located in Czyżyny Street (a 10-minute walk from the Faculty of Mechanical Engineering and a 20-minute bus ride from the faculties on Warszawska Street and the city centre) and in Bydgoska Street (a 5-minute walk from the faculties on Podchorążych Street). Rooms in student residences vary in standard (single, double, triple and apartments) and facilities. The CUT has a rich sports infrastructure, including two sports halls, tennis courts, a fitness club and gym, and a sailing centre in Żywiec.

1.8 University of Franche-Comté

Founded in 1423, the University of Franche-Comté (hereafter UFC) is a multidisciplinary university with a health sector, structured around 12 components (6 faculties, 5 institutes and schools and the Observatory of the Sciences of the Universe, the Earth, the Environment, Time and Astronomy of Franche-Comté-Bourgogne (OSU THETA). The faculties are: Languages, Humanities and Society (SLHS); Health Sciences; Science and Technology (ST); Sports Sciences (STAPS); Legal, Economic, Political and Management Sciences (SJEPG); Science, Technology and Industrial Management (STGI). Institutes and Schools: Besançon-Vesoul University Institute of Technology (IUT BV), Belfort-Montbéliard University Institute of Technology (IUT BM), Franche-Comté Higher Institute of Engineering (ISIFC), National Institute of Teaching and Education (INSPE), Centre of Applied Linguistics (CLA).

The UFC is spread over 6 campuses and a total of 8 sites, 3 of which are in Besançon. The University also occupies 9 historical monuments. Bringing these buildings up to accessibility standards is therefore incompatible with their classification,

and the UFC has been granted a derogation to preserve this heritage. Similarly, solutions for energy efficient renovation of these buildings are complex to implement and very costly. The campuses in are Besançon (the main campus with over 86% of students and university headquarters), Belfort (7.8% of students), Montbéliard (4.5%), Vesoul (1.2%), Lons (0.3%) and Dôle. Altogether, the University has over 26,000 students, including 800 work-study students and 1,300 lifelong learners, and a further 2,000 to 3,000 students at the CLA. A significant proportion of students are enrolled in vocational courses that meet the needs of the local economy. The UFC employs 2,400 people, including 1,435 teaching and research staff and 965 administrative and support staff. Almost 84% are based in Besançon, with the rest mainly spread across Belfort-Montbéliard (14%) and Vesoul (2%).

The Bouloie-Temis Campus is the University's main and largest site, located in the north-west of Besançon, with almost 60% of the UFC's student population. This concentration allows the University to provide students with a range of services (accommodation, catering, organisation of university life, etc.). The campus is accessible by 2 bus lines with high-capacity buses during school and university working hours. In addition, the Bouloie Campus interacts closely with the nearby Temis technology park and the innovative ecosystem that has developed there, offering opportunities for students and young graduates. The campus is home to two major university libraries: BU Proudhon for the UFR SJEPG and BU Claude Oytana for the UFR ST and STAPS. The BU Claude Oytana, which has just been renovated and transformed into a Learning Centre, offers a virtual reality immersion room and a Fablab (Fabrication Laboratory) has also been installed. Directly adjacent to the UFR ST/SJEPG and STAPS buildings, a number of CROUS residences provide on-campus accommodation for students. These are complemented by private student residences in the immediate vicinity. The CROUS offers two main dining facilities, as well as a cafeteria-style fast food service at the UFR ST. The University Sports Department offers a wide range of sports activities in the UFR STAPS facilities on campus (gymnasiums, multi-sports hall, athletics hall, boxing hall, weight room, etc.), some of which (outdoor sports facilities: rugby pitch, athletics track, throwing area, etc.) have recently been renovated.

The Campus de La Boucle du Doubs is composed of two faculties and a library. The SLHS Faculty is spread over 2 sites - Mégevand and Arsenal / Canot (temporary site) - all located in the historic centre of Besançon, within easy reach of the city's main institutions and amenities. The SLHS faculty has 9 research laboratories dedicated to historical sciences, philosophy, psychology, literature, geography and the environment, as well as 1 laboratory dedicated to environmental sciences with a focus on archaeological research. The University Library, located in the heart of the Mégevand Campus, is outdated and too small for the number of students and therefore will be moved to the future Grande Bibliothèque (close to the Arsenal site) by 2027. Public transport is readily available near the two sites, with the possibility of parking a bicycle, while access by car is problematic. In terms of catering, the Mégevand site hosts a university restaurant and the Arsenal site a cafeteria. A second cafeteria will be located in the future Grande Bibliothèque. The CLA building is close to the Arsenal site. Its location in the emblematic La City building, on the edge of the city centre and in the immediate

vicinity of the Cité Universitaire. The building is easily accessible by bus and tram. The CLA also has its own library. The CROUS Canot residence is close to both the SLHS and the CLA. There is also plenty of private accommodation in the city centre. Eating out is possible in the vicinity. There is no university sports centre in the city centre, but students are welcome to use the one on the Bouloie Campus.

The INSPE is located on the Montjoux site. It is halfway between the city centre and the Bouloie Campus. It is served by public transport buses. It does not have its own university library and there are no student residences, but there is a cafeteria and a gym.

The Hauts-du-Chazal Campus, which specialises in health, is directly linked to the Besançon University Hospital. The first buildings were constructed in 2002/2003 and the campus continued to grow until 2011/2012. There are many links with the Témis Santé technology park, which has enabled the creation of new innovative companies in the health sector (genetics, RNA, etc.). The research activity on this campus is highly developed. The university library on the campus is very recent. There are many private student residences around the campus and the CROUS is also present, including a university restaurant and a food truck. There are no sports facilities, but the campus is easily accessible by tram.

The STGI Faculty and the IUT Nord Franche Comté are located in the two main urban centres of Northern Franche-Comté, Belfort and Montbéliard, and are divided into several campuses: the Portes du Jura Campus in Montbéliard; the Neel Campus and the Faubourg des Ancêtres Campus in the centre of Belfort; and the Techn'Hom Campus in Belfort, located on the historic industrial site which is an important showcase for the company. Research is strongly rooted in these two sites: The Franche-Comté Institute of Electronics, Mechanics, Thermics and Optics - Science and Technology (UMR CNRS FEMTO-ST), the Fuel Cell Laboratory (UAR FC-LAB) and the ELIADD Laboratory in Belfort on the Techn'Hom site; the Belfort Technology Park, located outside the campus; the research building on the Porte du Jura Campus in Montbéliard. The Belfort Campus has a library, which is currently being modernised. There is also an INSPE building on the campus. The Portes du Jura Campus in Montbéliard has a library from 1991. Its accessibility was completed with the construction of an external walkway in 2021. Transport links between the campuses in the two towns are provided by the TER (regional express train) and suburban and urban bus services.

The Vesoul Campus consists of 3 buildings: 1 mainly dedicated to INSPE activities, the other to IUT activities and a gym. It is located in the immediate vicinity of the Stellantis Plant, which hosts a large number of students and trainees. There is not much research activity on this campus and there is no building dedicated to a university library. Library resources are directly integrated into the IUT and INSPE buildings. The site has a university canteen.

There is an INSPE site on the Lons-le-Saunier Campus, in a building close to the town centre, near the main railway station. There is no university library, no university restaurant and no university sports clubs. The site is associated with a bachelor's degree in "Waste Management".

In September 2023, the UFC opened a new campus in Dole, offering two new programmes: a bachelor's degree in "Packaging and Packaging Logistics" and a bachelor's degree in "Data Science". There is no research or university library at this site. The campus will soon be relocated to a new site, which will include a university catering unit to meet the needs of students.

1.9 Aleksandër Moisiu University of Durrës

The Aleksandër Moisiu University of Durrës (hereafter UAMD) was founded in 2005 and first opened its doors for students in the 2006-2007 academic year. Located in the historic city of Durrës, Albania, the University has since become an important educational institution in the region. The main building, located near the sea, houses the Rectorate, administrative offices and two faculties. The campus, located outside the city, consists of two buildings, with a new building under construction, housing three faculties. The University has approximately 17,000 students and employs over 500 proactive and motivated academic staff. The UAMD offers more than 100 programmes, including bachelor's degrees, two-year professional programmes, master's degrees and doctoral studies.

The UAMD offers various study programmes allocated to five faculties, including Faculty of Education, Faculty of Information Technology, Faculty of Business, Faculty of Professional Studies and Faculty of Political Sciences. Each faculty has specialised classrooms and laboratories tailored to their respective disciplines. For instance, the Faculty of Information Technology has state-of-the-art computer labs, electronics labs, an audio-video studio and a virtual reality hub. These facilities enable students to gain hands-on experience with the latest technological advancements, preparing them for successful careers in IT and related fields, from software development to data science, while the Faculty of Education has modern classrooms designed for interactive and blended learning and offers a range of programmes aimed at developing competent educators capable of meeting the demands of the modern educational landscape.

The Faculty of Professional Studies is focused on professional degrees, this faculty is equipped with specialised laboratories designed to provide practical, hands-on training. These include a mechanical engineering laboratory, a maritime laboratory, a physiotherapy laboratory, a physics laboratory, an energy efficiency laboratory, etc. These facilities are an integral part of the Faculty's mission to offer programmes that are closely aligned with industry needs, ensuring that graduates are well prepared for professional careers in their respective fields. The Faculty's emphasis on practical skills and applied knowledge makes it a leader in vocational and technical education.

In addition to the specialised facilities within each faculty, the UAMD offers a range of shared infrastructure designed to enhance the overall academic experience. The UAMD campus is equipped to host academic conferences, workshops, cultural events and guest lectures, creating a vibrant and stimulating environment for intellectual exchange. Three well-equipped conference rooms serve as venues for these events, facilitating a dynamic and engaging campus life.

The UAMD also features three spacious and well-stocked libraries with a wide range of academic resources, including books, journals and digital materials. These libraries provide quiet study areas, group discussion rooms and computer stations for research, ensuring that students and staff have access to the resources they need for academic success. Essential to the University's commitment to fostering a culture of learning and research, the libraries support both individual study and collaborative research.

The UAMD Campus offers parking and bus services to improve accessibility and convenience for students, faculty and visitors. Currently, the UAMD does not have any student accommodation on campus. However, plans are underway to address this need. The University is committed to improving the student experience by providing comfortable and convenient accommodation.

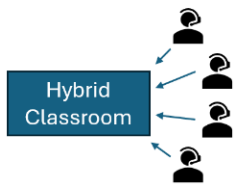# 2 Hybrid teaching – the heart of digital campus

Hybrid teaching has emerged as a fundamental component of the digital campus, playing a crucial role in facilitating collaboration across the Alliance of our nine partner universities. By allowing both in-person and remote participants to engage in the same educational activities, hybrid teaching makes joint educational programs possible, despite geographical boundaries. To explore this concept fully, we first define the hybrid teaching model and outline four possible teaching scenarios. Following this, we assess the current technical infrastructure and information systems available at each partner university to support hybrid learning. Lastly, we present the results of a survey conducted among both teachers and students, which sheds light on their experiences with Blended Intensive Programs (BIPs) and their expectations for the features and functionalities of the digital campus.
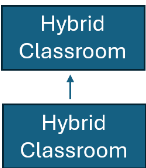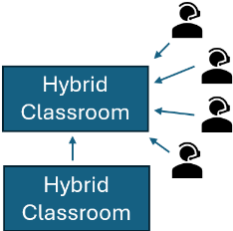
2.1 Definition of a Hybrid Classroom

A **hybrid classroom** is a learning environment in which instruction is delivered simultaneously to both in-person and remote students. The goal of a hybrid classroom is to provide flexibility by allowing some students to participate physically in the classroom while others join a hybrid classroom in another location via video conferencing, either individually or as a group.

In a hybrid classroom, technology plays a critical role in bridging the gap between face-to-face and remote students. Tools include video conferencing software, interactive whiteboards, document-sharing platforms and digital collaboration tools. A major challenge for the teacher is to engage all students at the same time and ensure that remote students can engage in real-time with those in the classroom. We can consider three possible scenarios described in Table 1.

Table 1: Alternative scenarios of hybrid classroom

	Scenario 1: Teacher activates a Zoom room that students can connect to remotely. The students in the Zoom room are displayed on a monitor in the classroom that is visible to the students in the room. The teacher chooses which camera/display is shown to the remote students, i.e. the whiteboard, the students in the classroom, the teacher, etc.

	Scenario 2: Two (or more) hybrid classrooms are linked together. One room with the teacher becomes the "master" room, controlling what the other room sees and hears, as in scenario 1.
	Scenario 3: A combination of 1 & 2.

Each presents the teacher with new challenges and requires both technical and pedagogical skills to be fully exploited. Each scenario also requires us to test our tools and classrooms for interoperability to ensure that our future digital campus can provide the necessary technical platform to deliver courses in the way our teachers want.

2.2 Evaluation of a Hybrid Classroom

To determine whether a classroom is equipped for hybrid learning, several factors related to physical and technological infrastructure as well as pedagogical skills need to be considered.

Technology Infrastructure

- **Audio-Visual Equipment:** High-quality cameras and microphones are essential to ensure that remote students can clearly see and hear the teacher and students in the classroom. Ideally, the camera should offer wide-angle views to capture both the instructor and the classroom. Alternatively, there should be multiple cameras that can be manually or automatically controlled to focus on the speaker or whiteboard.

- **Digital whiteboards:** These tools allow instructors to display content, take notes and conduct interactive sessions that can be viewed by both in-person and remote learners. These can be available on the teacher's computer, for example in Zoom, but can also be integrated into the classroom control system.

- **Projector/Screen for Remote Student Visibility:** A screen or display showing the remote participants should be present in the classroom so that the students in the room and the teacher can see and interact with the remote students.

- **Video Conferencing Software Integration:** The classroom must be equipped with platforms like Zoom, Microsoft Teams, or Google Meet for live streaming.
- **Ease of Use for teachers:** The system should be intuitive, with user-friendly interfaces for managing student participation, viewing materials and using collaborative tools.
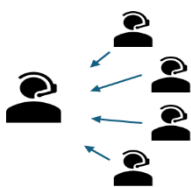
Teacher Support and Training

- **Professional Development for Teachers:** Teachers need proper training on how to manage hybrid teaching effectively, including the use of technology, engagement strategies for remote learners, and managing the dual demands of in-person and online instruction.
- **Technical Support Availability:** Ongoing access to IT support is crucial for troubleshooting technology issues that may arise during live classes. Staff should be available to assist with any technical glitches during the session.

Scalability and Flexibility

- **Scalable Technology:** The classroom should support a range of class sizes, from small group sessions to large lectures. The technology infrastructure should be robust enough to handle multiple participants without compromising quality.
- **Adaptability to Different Teaching Styles:** The space should accommodate a variety of teaching styles, from lecture-based to project-based or collaborative learning. Flexibility in layout, tools and technology allows teachers to adapt the environment to suit lesson plans and student needs.

Table 2: The currently viable scenario of hybrid classroom

	Scenario 4: Zoom teaching is a **fully online** model where all students and the instructor participate remotely through a video conferencing platform. In this setup, students access the course from their own locations, and all instruction is delivered virtually. The instructor uses tools like screen sharing, breakout rooms, polls, and chat to engage students.

- **Pros:**
  - **Accessibility:** Students can participate from anywhere, making it flexible and convenient for those with geographical or logistical constraints.
  - **Digital Tools:** Zoom offers a wide range of built-in interaction features, such as breakout rooms for group work, live polls, and chat for real-time Q&A.
  - **Recordability:** Zoom sessions can be easily recorded, allowing students to revisit lessons at any time. This is where the legal differences need to be considered.

- **Cons:**
  - **No Physical Interaction:** Teaching in Zoom eliminates face-to-face engagement, which may affect student connection, motivation, and non-verbal communication.
  - **Technical Challenges:** Dependence on technology introduces the risk of internet connectivity issues, audio-visual glitches, and limited engagement for students with poor tech infrastructure.
  - **Zoom Fatigue:** Prolonged periods of screen time can lead to fatigue for both students and teachers, reducing attention spans and participation.

2.3 Current state of the Alliance

We asked our STARS partners to describe their classrooms and meeting rooms to see how well we are equipped to meet these criteria. The table below illustrates our ability to deliver a course with **a full class in hybrid classrooms** across multiple universities. Table 2 summarizes the findings.

Orange means that there are aspects of the criteria that are not fully met. We could probably run a course, but with some limitations and with a lower quality of teaching than we would prefer. The most common criteria that is difficult to do well is audio quality and the ability to pick up voice and image in the classroom so that students can hear and talk to each other.

Table 3: Fulfillment of hybrid classroom criteria

Scenario	CUT	HANZE	HSB	IPB	SUO	ULL	UFC	UAMD	UW
1	Orange	Blue	Blue	Blue	Orange	Blue	Orange	Orange	Blue
2	Orange	Orange	Orange	Orange	Orange	Blue	Orange	Orange	Blue
3	Orange	Orange	Orange	Orange	Orange	Blue	Orange	Blue	Blue
4	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue

To facilitate hybrid courses, we also look at our Learning Management Systems as well as which video conferencing solution is in use (Table 3 and Table 4).

Table 4: Comparison of video conferencing tools

	CUT	HANZE	HSB	IPB	SUO	ULL	UFC	UAMD	UW
Zoom	X		X	X			X	X	X
MS Teams	X	X		X	X	X	X	X	X
Google Meet								X	
BB Collab.		X							

Table 5: Comparison of Learning Management Systems

	CUT	HANZE	HSB	IPB	SUO	ULL	UFC	UAMD	UW
Ilias			X						
Moodle	X					X	X		
Blackboard		X							
ISSU					X				
Sakai				X					
Pitagora								X	
Canvas									X

Assuming that the goal of the Alliance is to be able to offer both full courses and individual modules within courses, regardless of the number of students, seamlessly between partners, the notes for improvement would be as follows:

1. For "small" BIP courses (3-10 students from each university) use scenario 4, i.e. fully online meetings in Zoom/MS Teams. Most students and teachers will have some experience of this.
   Alternatively, use scenario 2, but with meeting rooms equipped with the necessary technology.

2. For "large" (10+ students from each university) BIP courses, we need to ensure that the teacher(s) responsible for the course contact our officers so that technical and pedagogical support staff can be involved to check that we can provide a technical platform for the course based on the teachers' needs. At the moment this is still a learning experience for us.

3. The video conferencing tool used by the vast majority of our alliance is MS Teams, followed by Zoom. We recommend that all members ensure that they are able to receive, participate and support teachers/students in both systems.

4. Our Alliance is very diverse when it comes to Learning Management Systems. The Digital Campus (Task 5.5) will need to look more closely at our needs and make a recommendation.

2.4 Feedback on hybrid teaching and digital campus from the STARS EU community

The two questionnaires examined BIPs/COILs and other hybrid/digital modules from the perspective of both teachers and students, recognising that each group has slightly different priorities and focuses. While the same questions were asked of both groups, teachers were asked to provide more detailed responses, particularly in relation to the organisation of these programmes. The results of the survey reveal the contrasting views of the two groups, with teachers offering more insight into the logistical aspects and students likely to emphasise the learning experience. These differences reflect the different roles and concerns of each in the hybrid/digital teaching environment.

2.4.1 Teachers' experience

Besides information on the organisational aspects of the hybrid/digital modules, the questionnaire focused on the overall technical concept of the modules. Due to the different LMS systems of the partner universities, the course organisation varied from case to case, either using the organising institution's system, communication platforms such as WhatsApp or Discord, or not implementing the LMS at all.

In terms of communication and information dissemination, most modules used Zoom or MS Teams as the main platform. Occasionally, the leading partner's LMS or Discord was used instead. In accordance with the videoconferencing tools used by each university (see 2.3), the hybrid/digital modules were conducted via Zoom, MS Teams, Discord and Google Meets, with the amount of use indicated for each. Additional didactic and teaching tools varied across courses, with no clear preference: Google Colab, Jamboard, Wooclap, Kahoot, Mentimeter, Miro Board, Canvas or Quizlet.
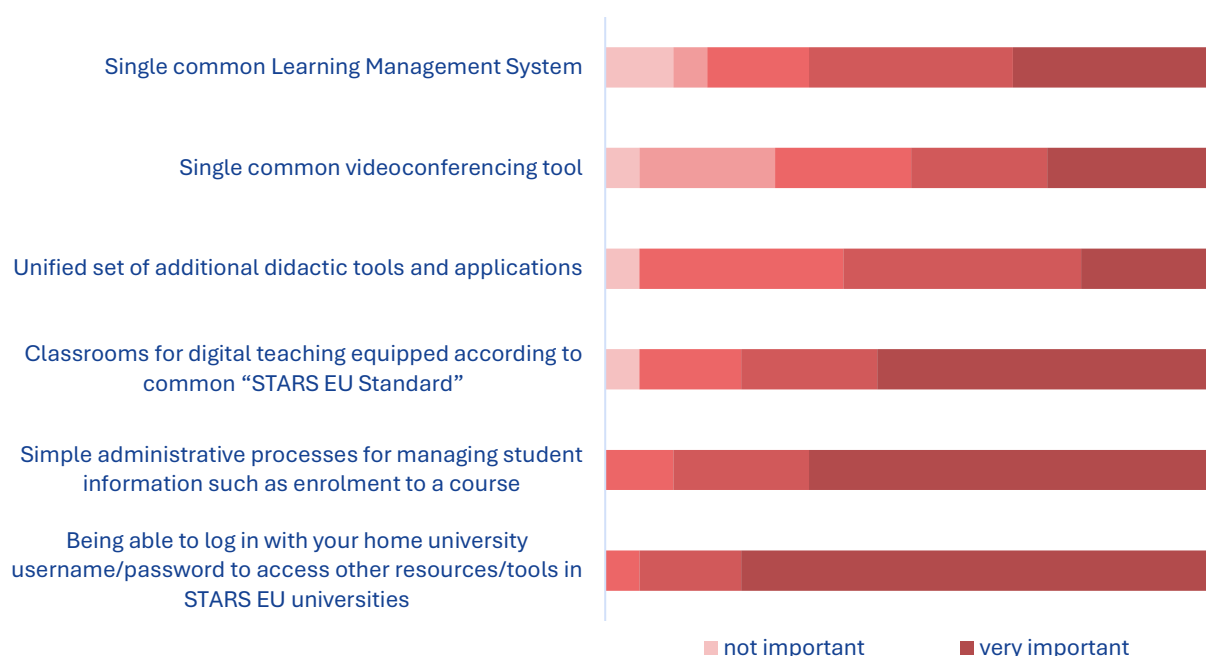
When asked for their views on how to technically enhance the digital teaching experience, teachers made several suggestions. They recommended hybrid models that combine digital and physical elements, especially for international students. Interactive tools like polls and quizzes were suggested to increase engagement, while technical improvements such as better streaming quality, internet connections and equipment were highlighted. Issues with microphones and acoustics were identified as problematic. Teachers also advocated more asynchronous content, like podcasts, and praised adaptable platforms like Discord for managing digital classrooms. Institutions were encouraged to upgrade equipment to better support digital teaching.

Teachers also shared their didactic approaches and how digital teaching could enhance them. They emphasised the use of interactive platforms including Discord, Vevox and Kahoot to engage students and facilitate collaboration. Challenges include maintaining interaction in remote classes, especially when students don't use cameras. To keep students engaged, teachers use teamwork, feedback and small assignments. Hybrid models that combine digital and physical learning were valued for deeper discussion, and gamification and active learning methods were seen as motivating. Other suggestions include polls, breakout rooms, and the creation of both formal and informal digital spaces for student interaction.

Focusing on the benefits of features, the survey responses highlight several advantages of hybrid/digital teaching, although opinions vary. Key benefits include removing geographical barriers, enabling participation from different countries and promoting diversity and international collaboration. It's cost-effective and time-saving, allowing more students to apply from different locations. However, many respondents prefer face-to-face teaching, citing that digital methods are less efficient and less engaging. Physical presence is seen as crucial for deeper interaction, although digital tools facilitate broader, faster communication and can promote IT skills. Overall, hybrid formats are useful for international connections, but can't fully replace face-to-face learning.
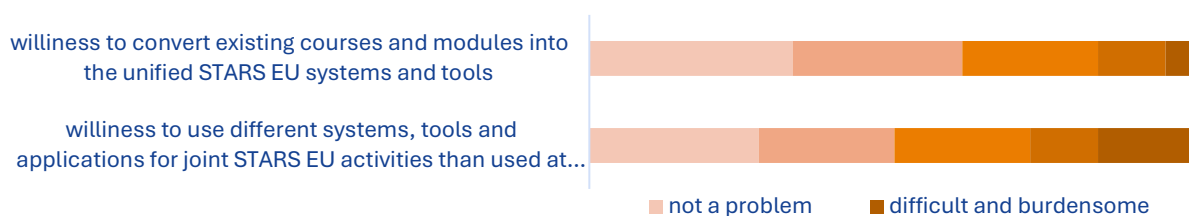
Another section of the survey was dedicated to various features of the STARS EU Digital Campus. For specific areas, participants rated the relevance of selected elements and the feedback obtained is depicted in Figure 1.

Figure 1: Importance of selected features of the STARS EU digital campus (teachers)

In addition, when asked about other key elements of the STARS EU Digital Campus, respondents highlighted several important features. Key points include the need for a single, user-friendly platform that is easy to navigate and flexible for different teaching needs. Many expressed a preference for avoiding frequent changes in digital tools, with some highlighting the value of existing platforms such as MS Teams. Suggestions included clear communication and guidance on how to use the tools, encouraging interdisciplinary research, open science and accessibility. Other responses emphasised collaborative workspaces, maintaining a consistent identity, and providing comprehensive information on different aspects of the campus, such as mobility and study materials. Lastly, teachers were asked about the potential flexibility for future development of hybrid/digital modules. The answers are summarized in Figure 2.

Figure 2: Adaptability in developing the STARS EU digital campus (teachers)
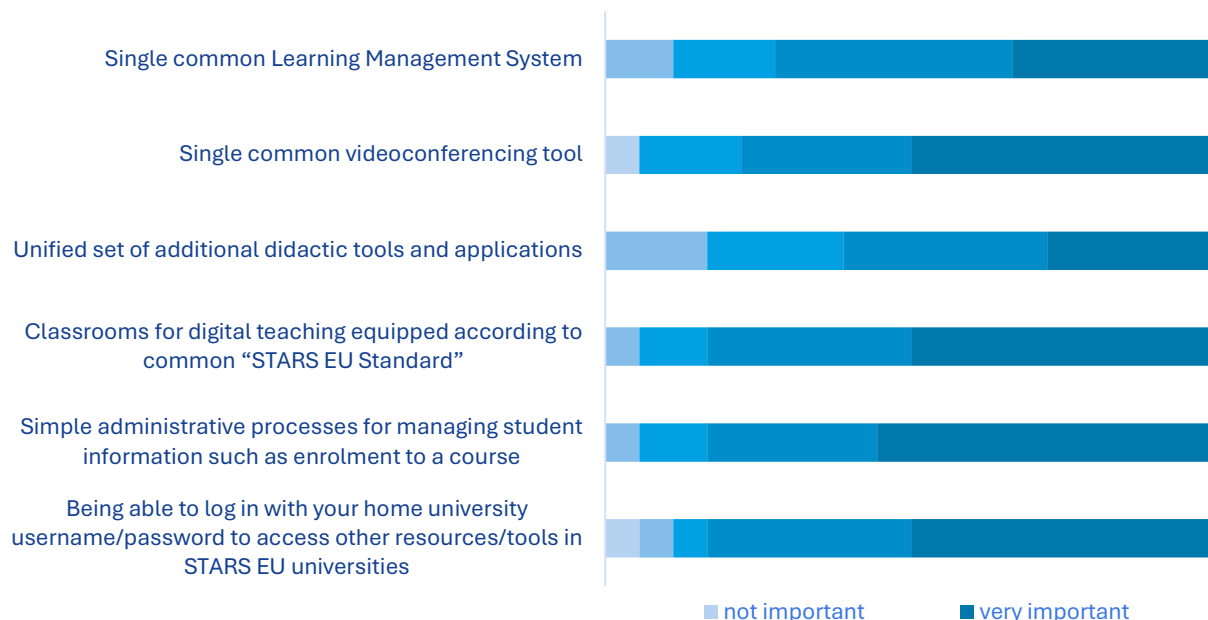

2.4.2 Students' experience

As indicated above, the student survey contained almost identical questions to the teacher survey, but the focus was more on their point of view. Both communication platforms and videoconferencing tools are in line with the information given by the tutors.

The students' perspective offered a further opinion on the technical improvement of the modules. Participants suggested several ways to technically improve the digital teaching experience. Common issues included microphone and acoustic problems, as well as occasional lost connections. Some respondents emphasised the need to involve students more with questions and exercises to keep them engaged. Others highlighted the need for better access to computers, clearer instructions on how to use the platforms, and the use of a single, standardised platform for all classes. Overall, many found the experience well organised, with some minor improvements suggested, particularly in relation to sound quality and platform use.

In terms of the benefits of hybrid/digital teaching, respondents highlighted flexibility, time savings and the ability to participate from anywhere. Many appreciated the ability to combine study with work and other responsibilities. Students valued learning new software, improving teamwork and fostering rapid communication within teams. The format also facilitated international links, allowing easy participation and opportunities to interact with teachers and students from different parts of the world. Some saw it as a useful introduction before attending physical classes, while others noted the importance of practising English skills.

Similarly to tutors, students were asked to rate the importance of certain features of the STARS EU Digital Campus. The responses are graphically presented in Figure 3.

Figure 3: Importance of selected features of the STARS EU digital campus (students)

Participants highlighted several important elements for the STARS EU Digital Campus. Many stressed the need for consistency, requesting a single, user-friendly platform like MS Teams, avoiding constant changes to tools. Flexibility and adaptability of tools were also emphasized, allowing customization for specific student needs. Participants called for better user guidance, clarity in online communication, and easy access to collaborative spaces such as forums. Open science, interdisciplinary research, and accessible design were seen as key. Some also mentioned the importance of maintaining a unified approach and encouraging participation in international exchanges, with English proficiency as a priority. In accord with the teachers, the students were also lastly asked about their potential flexibility for future enhancement of the hybrid/digital modules (Figure 4).

Figure 4: Adaptability in developing the STARS EU digital campus (students)

2.4.3 Comparison of the perspectives

LMS, communication platform and videoconferencing tools

Both the teacher and student surveys, where the questionnaire explored the organisational and technical aspects of the hybrid/digital modules, were consistent on this point. Given the different Learning Management Systems (LMS) used by the partner universities, course organisation varied - some relied on the host institution's LMS, others used communication platforms like WhatsApp or Discord, while in some cases no LMS was implemented at all. For communication and information sharing, Zoom and MS Teams were the main platforms used, with occasional use of Discord or the leading partner's LMS. Modules were delivered using a variety of videoconferencing tools, including Zoom, MS Teams, Discord and Google Meets, depending on the university. Additional teaching tools varied widely between courses, including platforms such as Google Colab, Jamboard, Wooclap, Kahoot, Mentimeter, Miro Board, Canvas and Quizlet, with no clear preference for any single tool.

Technical enhancement

The comparison of teachers' and students' views on improving digital teaching reveals both common concerns and different priorities. Both groups identified problems with microphones, acoustics and technical issues such as connection stability. They also agreed on the need to improve student engagement, with teachers suggesting interactive tools and students favouring more questions and exercises.

Differences included teachers' preference for hybrid models and asynchronous content such as podcasts, while students prioritised a single, easy-to-use platform with clearer instructions. Teachers emphasised institutional support and equipment updates, while students focused on personal access to technology and guidance on how to use it.

Benefits of hybrid/digital teaching

Both teachers and students agree on several advantages of hybrid/digital teaching, such as flexibility, time savings and the ability to connect internationally. However, they differ in their preferences and areas of focus. Teachers favour traditional face-to-face teaching for its engagement and effectiveness, while students prefer digital formats for their convenience and the ability to juggle different commitments. Students also value specific learning opportunities, such as mastering new software and improving teamwork and English skills, which teachers see through the lens of broader communication and IT skills development. Ultimately, while both groups recognise the benefits of hybrid/digital teaching, teachers emphasise face-to-face interaction, while students emphasise the practical benefits of the digital format.

Key elements of the STARS EU Digital Campus

Both teachers and students identified several important features for the STARS EU Digital Campus. A strong consensus emerged around the need for a single, user-friendly platform, such as MS Teams, that is easy to navigate and adaptable to different teaching

needs. Both groups expressed a desire to avoid frequent changes in digital tools and emphasised the importance of clear communication and guidance on how to use these platforms effectively.

Collaboration was also a priority, with respondents highlighting the need for accessible spaces for teamwork and interaction, such as forums. In addition, both teachers and students emphasised the importance of open science, interdisciplinary research and accessible design in improving the digital campus experience. Maintaining a unified identity and encouraging international exchange, together with a focus on improving English language skills, were also identified as key elements for success. Overall, there is a shared vision for a consistent and flexible digital environment that promotes effective collaboration and learning.

Features of the STARS EU Digital Campus

The findings revealed a number of common points. Both groups emphasised the need for a single common Learning Management System and a single common videoconferencing tool and expressed strong support for these features. They also valued a common set of additional didactic tools and classrooms equipped according to the common "STARS EU Standard". There was also strong agreement on the importance of simple administrative processes for managing student information and access with home university credentials. Overall, both teachers and students showed a strong preference for features that enhance usability, accessibility and standardisation within the STARS EU Digital Campus, indicating strong support for common systems and tools to improve the digital teaching experience across partner universities.

Adaptability to different systems, tools and applications for joint STARS EU activities

Teachers expressed a range of reactions to the use of different systems. Many expressed an openness to using new tools, but some indicated that they found the transition to different platforms challenging.
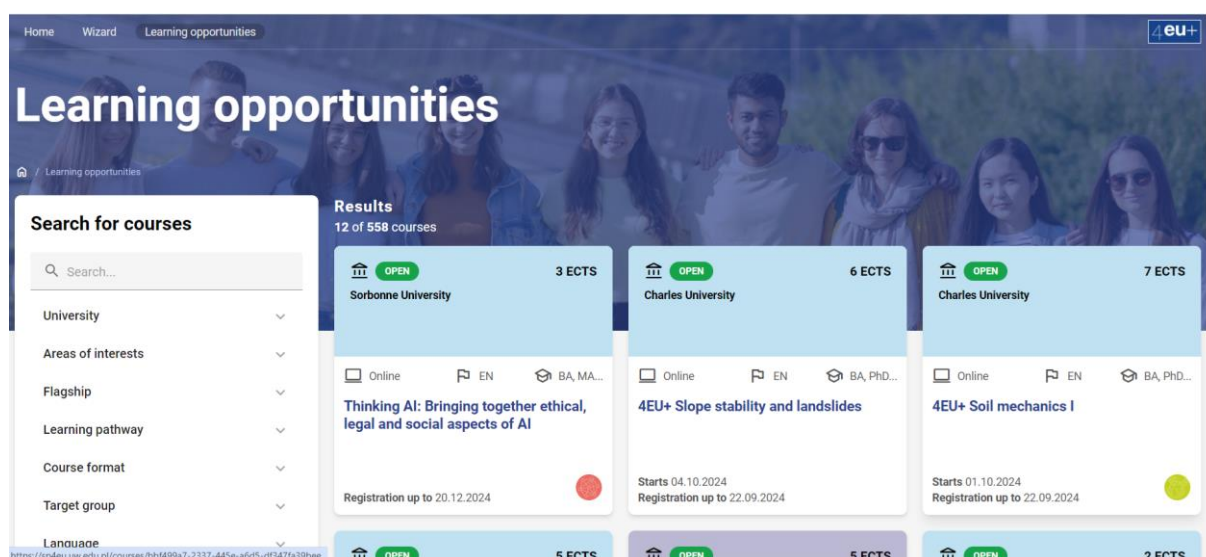
Students, on the other hand, were generally more positive about adopting new systems. The majority indicated that they were comfortable using different applications, with no participants expressing significant concerns about the difficulties associated with this transition.

3 Lessons learned from other EUAs

Inspiration and valuable experience in building and developing a digital campus can be gained from European universities that have been around for a long time. In the form of guided interviews, we discussed these issues with representatives of two European universities, namely 4EU+ and INGENIUM. Both alliances are similar to STARS EU in terms of the number of member universities and include universities from most of the countries involved in STARS EU. While the INGENIUM alliance was selected in the 2022 call for European universities, the 4EU+ university already received funding in the 2019 call. Each European university is therefore at a different stage in the creation of its digital campus, which provides us with valuable insights.

3.1 4EU+

The 4EU+ Digital Campus is integrated into the Alliance website (https://4euplus.eu/4EU-631.html?), where it is located in the Campus section. Entitled Student Portal, the section provides an up-to-date overview of the 4EU+ Alliance's portfolio of education, training and development opportunities. Future plans include extending the functionality of the Digital Campus to give users access to the **Traineeship and Course Catalogue**, which would include courses to deepen intercultural competence and other soft skills, the **Learning Tools & Skills Inventory** and the Mobility Toolbox, which will focus on general guidelines for Alliance mobility activities.

In the context of building a digital campus, two common tools have so far been chosen for collaboration across the Alliance. Moodle has been selected as the appropriate learning management system for educational activities and is used by most of the partner universities with the aim of creating an "umbrella Moodle" to integrate each university's environment. However, Moodle is not connected to the Student Portal and therefore the Student Portal portfolio does not include the student materials. The second tool,

Microsoft Teams, is used for video conferencing and document sharing and runs under the licence of Charles University (Czech Republic).

The current state of the digital campus falls short of expectations and original plans. The creation of the current digital campus took about 3 years. The main obstacles in the development of the digital campus were the limited compatibility and interoperability of the partner universities' information systems, the difficulty in identifying and implementing a suitable common technical solution, the complexity of the "single sign-on" issue, and significant national differences in the interpretation of the GDPR. Reaching consensus on the content and functionalities of the digital campus was also a very time-consuming process.

Apart from the Student Portal, which focuses on the Alliance's portfolio offerings, Moodle and MS Teams, which serve as a repository for student materials and a meeting platform respectively, the Alliance's current collaboration platform, which focuses on science and other data storage, is SharePoint.

3.2 INGENIUM

The Alliance's Digital Campus will be part of its website, with basic information currently available in the Students/Digital Ingenium section. As Ingenium has received funding in 2022, the development of the Digital Campus is still in its early stages. The Digital Education Platform and the Virtual Student Register are currently being developed. The Digital Education Platform (https://elearn.ingenium-university.eu/?lang=en) will host all e-courses created by the Ingenium partners, including resources of various types and activities to improve student engagement. The Virtual Student Registry will provide student administration and registration for courses, curriculum management, exam administration and grading. Other elements of the digital campus are planned, in particular the Collaboration Platform to support inter-institutional research and projects and the Proposal. Submission Platform for the submission of research proposals, project ideas and other collaborative initiatives.

Moodle has been chosen as the learning management platform and is currently in the demo phase. Moodle will facilitate course management, student engagement and academic collaboration across the universities. In addition, the Ingenium email system has been implemented to streamline email communication within the Alliance and to overcome any issues with university-specific email systems. A common file repository has been established for work package members to share and collaborate on documents. An open data repository for academic research is being developed and will be available soon to support data sharing and transparency. Ingenium has typically used available open-source solutions for these purposes. Several video conferencing services are used within the Alliance, in particular Zoom, Big Blue Button and Webinar.

The development of the digital campus is slightly behind schedule due to several factors. The discussion on a standardised protocol and terminology was very important. Differences in terminology and protocols between member universities were identified as potential barriers to seamless integration and collaboration. Guidelines were also developed on how data should be formatted, shared and stored to ensure compatibility and security across platforms. Interoperability standards also needed to be defined for the common digital campus to function effectively, i.e. technical standards to ensure that systems used by different universities can work together seamlessly, facilitating the exchange of information and resources.

Conclusion and recommendations

The physical campuses of the partner universities share several common characteristics, yet each retains distinct regional, historical, and architectural traits. All campuses are dedicated to supporting academic and student life through various facilities such as libraries, housing, sports facilities, and dining options. They emphasize the integration of research and education, with advanced laboratories, lecture halls, and spaces for student interaction.

However, the differences among them are significant, particularly in scale and specialization. For instance, while Hanze emphasizes public-private partnerships on its Zernike Campus and focuses heavily on energy, chemistry, and life sciences, the ULL is deeply rooted in regional culture with multiple campuses spread across Tenerife, serving a wide variety of disciplines. Similarly, the SUO has campuses in various cities, each hosting specialized faculties, and the IPB demonstrates a strong connection to regional development through its applied research facilities. These variations reflect not only regional priorities but also the evolution of each institution's educational model.

The digital campus's hybrid teaching approach represents the core of the STARS EU alliance's vision for future educational collaboration. Hybrid teaching enables simultaneous participation from both physical classrooms and remote locations, breaking down geographical barriers and fostering a more inclusive learning environment across partner institutions. This flexibility makes joint educational programs possible even when students and faculty are spread across Europe. The integration of hybrid teaching tools such as video conferencing platforms, digital whiteboards, and collaboration spaces allows students from diverse regions to interact, which is critical for fostering cross-cultural academic exchange.

The survey results among teachers and students further underscore the importance of hybrid teaching. Both groups appreciate its flexibility and capacity for international collaboration, although challenges related to engagement and technical infrastructure remain. These challenges emphasize the need for ongoing investment in technology and pedagogical training to fully capitalize on the potential of the hybrid model.

The technical infrastructure and systems used across the partner universities show both similarities and differences. Common tools like Microsoft Teams and Zoom are widely adopted for video conferencing, enabling effective communication between institutions. However, the LMS in use differ significantly - ranging from Moodle to Blackboard, with some universities relying on institution-specific platforms.

In terms of technical equipment, some universities are better equipped to support hybrid teaching than others. For instance, universities like Hanze and UW have more advanced audio-visual setups for hybrid classrooms, while others report challenges with audio quality and real-time engagement tools. Overall, the survey shows that there is room for improvement in achieving consistent standards for technical equipment and support across the alliance.

Drawing on insights from the experiences of 4EU+ and INGENIUM alliances, STARS EU can enhance its digital campus development by adopting a phased approach. Both alliances emphasise the importance of building a common digital infrastructure which ensures interoperability of digital tools across member institutions to promote seamless collaboration. A key lesson from other alliances is the successful integration of their digital campus within the alliance's main website, positioning the website as the central hub for individual services. This allows smooth access to essential tools, resources, and collaboration platforms, fostering a cohesive and user-friendly experience.

Based on the analysis and feedback from students and staff, the following recommendations are proposed for the continued development of the STARS EU alliance's physical and digital campuses:

Harmonization of Digital Tools: The adoption of a single, user-friendly platform for Learning Management Systems and video conferencing across the alliance is critical. This would reduce technical barriers and streamline the hybrid teaching experience for both students and faculty.

Standardization of Technical Infrastructure: To support effective hybrid teaching, universities should aim to standardize the equipment used in classrooms across the alliance. This includes ensuring high-quality audio-visual systems, reliable internet connections, and consistent technical support.

Enhancing Teacher and Staff Training: The success of hybrid teaching relies not only on technology but also on teachers' ability to effectively manage both in-person and remote participants. Offering ongoing professional development and training in digital pedagogy will help ensure that faculty members are equipped to use hybrid tools effectively.

Investment in Physical Campuses: While the digital campus is central to STARS EU's future, physical campuses must also continue to evolve in alignment with the alliance's goals. Partner universities should consider their membership in STARS EU when planning new buildings or renovations. This includes implementing a unified signage system that reflects the alliance's identity, as well as creating designated STARS EU classrooms or labs equipped with state-of-the-art technology to support collaborative research and hybrid learning. These physical investments will reinforce the shared vision of the STARS EU campus across all partner institutions.

Encouraging Interdisciplinary Collaboration: Digital campuses provide a unique opportunity to foster interdisciplinary and international collaboration. Encouraging joint research projects, blended courses, and student exchanges will further strengthen the academic ties between partner institutions.

Table of Illustrations