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Widening Access within Neurotech^{EU}

Summary of best practices

February 2021

Widening Access within Neurotech^{EU}: summary of best practices

Evidence-based report on existing practices that target widening participation and access to and within universities

Authors

This report was developed by faculty and administrative staff from the founding universities of Neurotech^{EU}- the European University of Brain and Technology, an initiative that aims to build a trans-European network of excellence in brain research and technologies to increase the competitiveness of European education, research, economy, and society. Neurotech^{EU} Alliance partners are listed below in the order of their assignment to project work packages:

- Radboud Universiteit (The Netherlands)
- Universidad Miguel Hernández (Spain)
- Karolinska Institutet (Sweden)
- Rheinische Friedrich-Wilhelms-Universität Bonn (Germany)
- Boğaziçi Üniversitesi (Turkey)
- University of Oxford (The United Kingdom)
- Universitatea de Medicină și Farmacie din Cluj-Napoca (Romania)
- Debreceni Egyetem (Hungary)

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Executive Summary

This paper offers readers a glance into the concept of NeurotechEU, as well as its importance in developing a common European identity. NeurotechEU aims at creating a multidisciplinary, international, and intersectoral way of learning in the context of a multicultural and multilingual environment. The joint vision is one of creating life-long learning programs, along with overcoming inequities in the process of pursuing higher education. The report also investigates the prospective impact on universities and modalities of developing a shared vision for students and faculty staff alike.

The central goal of this report is to pinpoint existing examples of good practices related to widening access in the context of Higher Education, describing them briefly and highlighting their applicability at the level of our consortium.

Physical, economic, social, cultural, and psychological factors all play a significant role in developing future members of society. We reviewed existing literature regarding means of employing creativity, open resources, and innovative technologies into solving the issues of access and inequity to education.

In the second part of the document, Alliance partners were encouraged to draft a short case study on the example of good practices most representative for them. By describing examples of positive action already implemented by universities partaking in the project, in the form of case studies, we seek to develop a personalized approach to education to create and strengthen connections between all stakeholders involved.

Finally, we suggest ways in which the NeurotechEU consortium may thrive, including the institution-specific context in the interpretation, translation, and enactment of learning processes, target groups for widening access, and evidence-based interventions on a variety of topics including admission, teaching, professional development, staff development and more.

Key findings
- Existing and novel virtual and blended learning are emerging as primary educational delivery paradigms, promising many opportunities for students and teachers alike by providing access and higher curriculum flexibility despite economic, geographical limitations, and, more recently, epidemiological crises.
- To avoid overestimating the effectiveness of widening participation interventions, it is crucial to develop more causal and robust evidence for most of the identified interventions, such as increasing aspirations and awareness in pursuit of higher enrollment rates in particular target groups, black box interventions, summer schools, and others.
- There is not enough research focused on vulnerable but overlooked groups, such as older students, carers, ethnic minority students and vocational students, disabled students, and LGBTQAI students.

Recommendations
- NeurotechEU must deploy efforts to define vulnerable populations, map issues of access to education, and research capacity must be prioritized to support the development of a progressive strategy of implementation of all feasible and desired best practices for widening access, as to promote effective use of available time and resources in the consortium.
- Universities must identify monitoring mechanisms for issues related to widening access and participation to education, following students early (i.e., starting at high-school level) and longitudinally across their educational and career tracks. This step is essential to allow evaluation of interventions in this broad field, opening universities to evidence-based decision-making rather than anecdotal reports or subjective input from students and staff.

Introduction, aims and objectives

The domain of higher education is crucial for the social and economic development of any country. Moreover, in the context of a pandemic and rapidly changing socioeconomic conditions, the need to safeguard access to education is crucial for the continued pursuit of technological innovation and the prosperity of society at large.

The material aims to provide an overview of best practices available at the eight founding universities of NeurotechEU to address the current situation regarding diversity and social inclusion within the European Higher Education Area and analyze possible avenues for integrating such practices within the NeurotechEU Alliance and similar endeavors.
Specific objectives of the report include:
1. Describing the NeurotechEU initiative
2. Showcasing the importance of widening access and participation to education in general
3. Defining key terms related to widening access (e.g., social inclusion)
4. Exploring a wide array of best practices from across the globe
5. Highlighting success stories implemented across NeurotechEU founding universities
6. Formulating recommendations for the NeurotechEU consortium.

As a baseline for the start of our journey, we seek to consolidate and uncover the translational value of scientific research for policymaking and policy implementation within the European Universities Initiative. The present report will be followed up by a policy and action plan that will provide recommendations at the university, consortium, and European Higher Arena levels.

About NeurotechEU

Our vision for the future

From health and healthcare to learning and education, Neuroscience plays a crucial role in addressing some of the most pressing societal challenges that we face in Europe today. Moreover, neuroscience shows excellent promise to become an applied science, to provide brain-centred or brain-inspired solutions that could benefit society and kindle a new economy in Europe. NeurotechEU aims to be the backbone of this new vision by removing the borders between institutions throughout Europe and creating an ecosystem to support education, research, innovation, and foster (societal) impact.

Based on 3500+ feedbacks we received from our students, we designed NeurotechEU programs to cross disciplinary borders across our universities, creating a unique organization not constrained by faculty, institutional and geographical boundaries. NeurotechEU students across the three cycles (Bachelor, Master, and Doctoral) will receive comprehensive multidisciplinary, international and intersectoral training designed to develop a common European identity with training and research opportunities in a multicultural, multilingual setting throughout the continent. In addition, NeurotechEU will actively promote lifelong learning via structured yet flexible, scalable, and personalized programs to remove obstacles to access to education, bridge inequalities in employment, and maximize human potential in an atmosphere where inclusion and diversity are celebrated.

At NeurotechEU, the next-generation multidisciplinary scientists and engineers will have access to cutting-edge infrastructure for fundamental, translational, and applied research in a large variety of disciplines as we help them become the transformative future leaders of society, industry, and academy. Beyond its educational mission, NeurotechEU research will facilitate technological and societal innovation by bringing together 250+ partnering organizations to create an innovation ecosystem and help Europe become the global leader in brain research and technologies.

NeurotechEU Key Deliverables

- **NeurotechEU Campus+** will create the crucial shared virtual space, an extension of the partnering organizations, where students, teachers, and administrators work together without administrative, cultural, and societal obstacles to provide physical, digital, and blended education.
- **NeurotechEU Graduate School** will provide co-tutelage education at the master's and doctoral levels to train top-flight researchers in a multidisciplinary and intersectoral setting. It will promote innovation and an entrepreneurial mindset. Each student will work on a Neurochallenge, i.e., a societal challenge that can be met by neuroscientific and neurotechnological knowledge and solutions.
- **NeurotechEU Life-long Learning Centre** will support the continued training of its graduates and society at large. It will provide the necessary knowledge, skill sets, and competencies for individuals to adapt to the changing personal, civic, societal and employment-related needs and provide them opportunities in brain research and technologies.
- **NeurotechEU Spaces** will be the virtual collaboration platform. Based on a suite of open-source software, the Spaces will provide the necessary tools to communicate, create, share and store information safely. It will address users' needs from any background, from a scholar studying the philosophy of mind to students jointly working on robotic control algorithms.
- **NeurotechEU Ecosystem.** Modern universities need to be integrated into the society and economy. This integration will help universities focus on their education, talent development, and innovation efforts based on the current and future needs of the world. It will also ensure that their graduates are embedded in an ecosystem, boosting their employability and promoting entrepreneurship. NeurotechEU will form its ecosystem by synergizing stakeholders in society, education, research, and innovation sectors across the continent.

How will NeurotechEU transform our universities?

Outstanding universities of the future will be more than institutions of education and research. By acting as the backbone of the Knowledge Triangle, higher education, research, and business will coalesce together in the Universities of the Future to define cutting-edge technology and push the boundaries of knowledge and scholarship. NeurotechEU will form a closely-knit network university of the future by "putting equity" into internationalization and cross-continental innovation.

NeurotechEU is an Alliance where students and staff jointly develop integrated and open study programs to combine study periods in different countries and settings across sectors. Mobility, physical and virtual, will be in all programs that are shared within the Alliance. In this way, NeurotechEU will contribute to the emergence of European degrees.

By pooling our educational and training capacity, utilizing next-generation virtual exchange and mobility platforms, and by increasing the cooperation between students and researchers, the rate of mobility will increase dramatically. Furthermore, information and communication technologies will enable a new interactive, virtual mobility platform to increase accessibility and inclusivity while providing a scalable, economical and modular alternative to physical mobility.

Finding ways for automatic recognition of learning periods, internships, and diplomas between the partners is a practical necessity. The increased cooperation between staff will support the trust and transparency required for automatic transparency. In addition, a comprehensive quality assurance system in compliance with the principles agreed within the Bologna process will give the Alliance a sound basis for implementing an automatic recognition system.

Training in intercultural settings fosters civic and language competencies through immersion into different contexts and will promote a sense of European belonging and improve creative thinking and

transversal solutions. In the end, our students will benefit from a Europe-wide alumni network, which will deliver its benefits in terms of internships, networking opportunities, and jobs across Europe.

Why do we need to Widen Access in NeurotechEU?

Although various stakeholders have strived to make academia more and more accessible during the last centuries, disparities remain well into the 21st century. Higher education now becomes a more and more accessible option across the globe from a small elite sector. European universities have experienced sustained changes related to policies, structure, organization, training, student population, and even their purpose. However, some students still face difficulties while entering academia, while for others, it might not even be an option. Some contributing factors can be of economic, social, political, or even physical nature. Education is the primary concern of our Alliance, as it represents a critical factor in the development of human potential and societal progress.

Examples of major disparities still present in education and research

Gender inequality in research and education

Firstly, only a fraction of female students select Science, Technology, Engineering, and Mathematics (STEM) related fields in higher education. International female enrollment is particularly low in specific fields. For example, around 3% of students joining information and communication technology (ICT) courses across the globe are women, while for mathematics and statistics courses, the percent settles around 5%, increasing to 8% for engineering, manufacturing, and construction courses. Women are more attracted to STEM courses in some regions of the world than others, but the global situation remains characterized by gender imbalances.

Secondly, women account for a minority of the world's researchers. Thus, despite the growing demand for cross-nationally comparable statistics on women in science, national data and their use in developing policies to address this vital issue often remain limited.
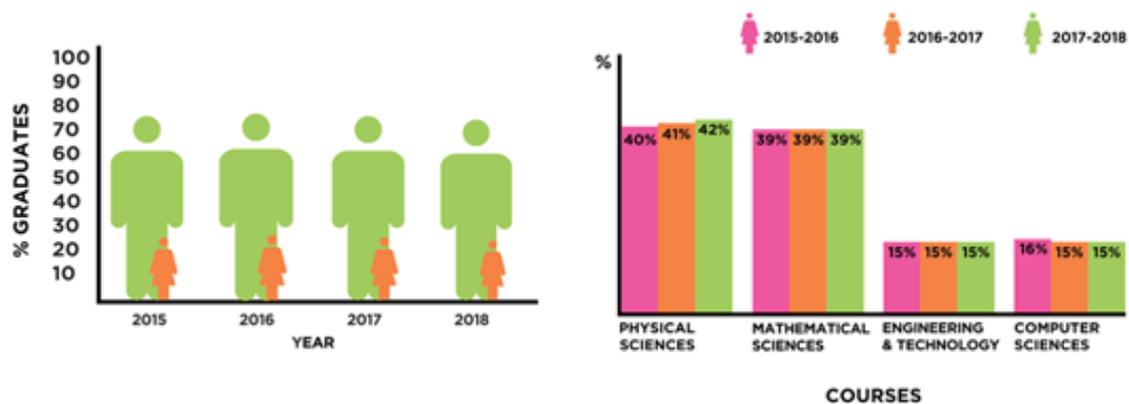
Figure 1. *Yearly trends in the breakdown of the proportion of female graduates in the United Kingdom across STEM fields. Source: Gender inequality statistics from the UCAS/HESA*
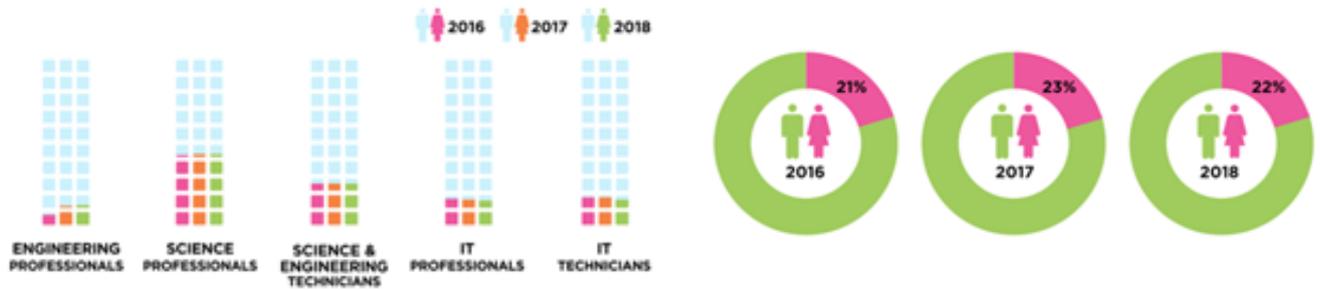
Figure 2. *Yearly trends in the breakdown of the proportion of female workforce in the United Kingdom across STEM fields. Source: Gender inequality statistics from the UCAS/HESA*

In addition to gender equality being the 5th Sustainable Development Goal, reducing the gender gap in Science, Technology, Engineering and Mathematics (STEM) education areas could help reduce the skills gap, increase women's employment and productivity, and reduce occupational segregation. Ultimately this would foster economic growth via both higher productivity and increased labor market activity.

According to the European Institute for Gender Equality, increasing women's participation in STEM subjects will have a powerful positive GDP impact at the EU level. Closing the gender gap in STEM would increase EU GDP per capita by 2.2 to 3.0% in 2050. In monetary terms, closing the STEM gap leads to an improvement in GDP by €610 - €820 billion in 2050 (Figure 3).
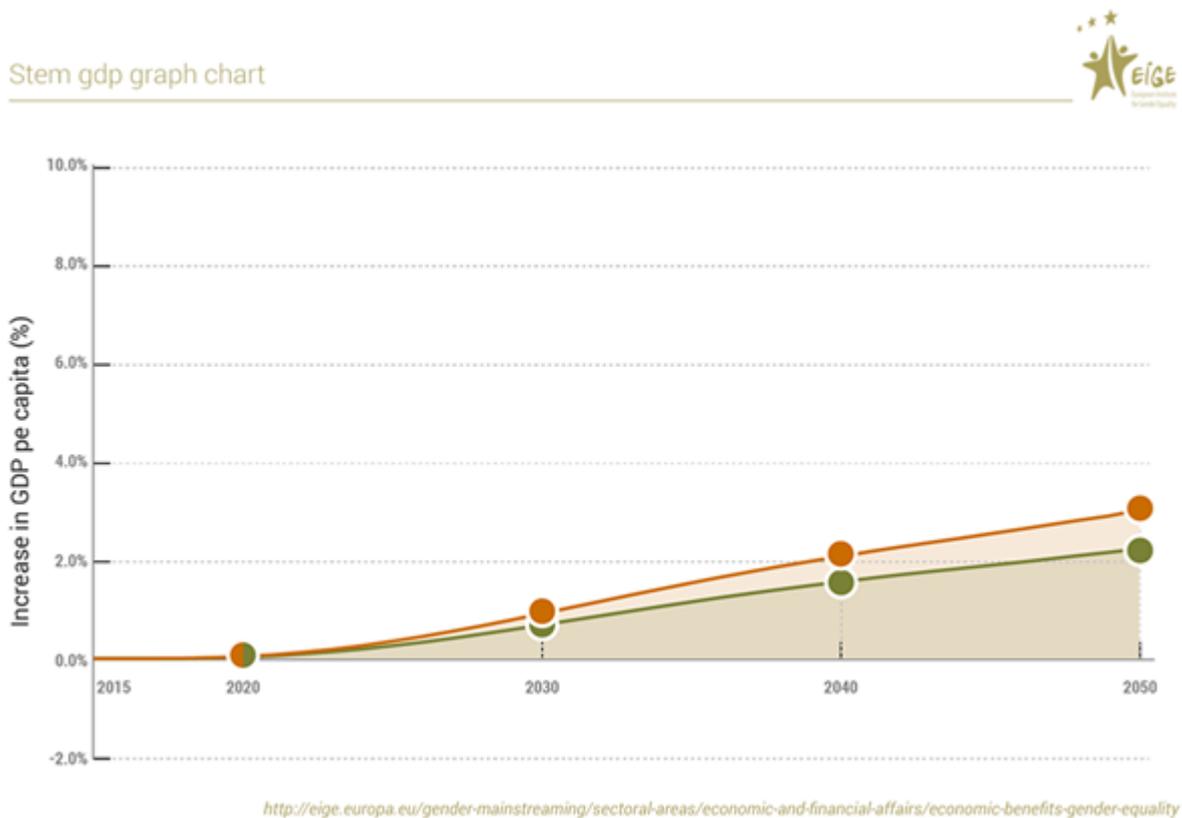
Figure 3. *GDP Impact of closing gender gaps in STEM Education*

Socioeconomic inequality

Income inequality represents another issue in access to education, with individuals from lower socioeconomic backgrounds facing discrimination in many aspects of their life, including higher education. A growing social concern is represented by the vast disparities in college attendance and completion. Socioeconomic inequality in higher education access is of similar magnitude throughout the globe, with young people of disadvantaged backgrounds struggling to pursue their educational goals, particularly in high-status institutions. These high-status institutions have the advantage of conferring substantial labor market rewards, creating a cycle of disadvantage in the future pursuits of socioeconomically vulnerable individuals. Although prior achievements play a significant role in access to elite institutions, this entry path does not account for the limitations experienced by students from poorer backgrounds, creating an indirect negative impact of socioeconomics on access to Higher Education. Some direct factors with the potential to restrict access include financial resources, information, knowledge of the application process, and family connections. The literature provides substantial evidence that, even when controlled for the indirect effect of high school achievements, substantial differences remain for people of different socioeconomic backgrounds. This comes as proof that simply bridging the academic achievement gap is not enough to eliminate differences in the transition to Higher Education.

In England, between 2004 and 2005, young people from the wealthiest fifth of families were over four times more likely to attend university at age 18-19 than people of the same age from the poorest fifth of families. In the case of "high-status" institutions, the gap is even wider, with those from the wealthiest fifth of families being ten times more likely to attend said institutions than their peers from the poorest fifth **(3).**

Both direct strategies, such as financial support and quality guidance, as well as regulatory measures for university admission that control for the direct effect of socioeconomic impact on access (such as the consideration of life experiences and other non-traditional paths of entry into academia), have the potential to offer a better access for people of lower socioeconomic status who wish to pursue higher education).

The 2030 Agenda for Sustainable Development regards equity as a central pillar for sustainable development and aims to ensure that no vulnerable population, such as those of lower socioeconomic background, is denied the right to fulfil their potential and lead rewarding lives.

Sustainable development goal (SDG) 10 specifically mentions an interest in „promoting social, economic and political inclusion for all" (United Nations, 2015).
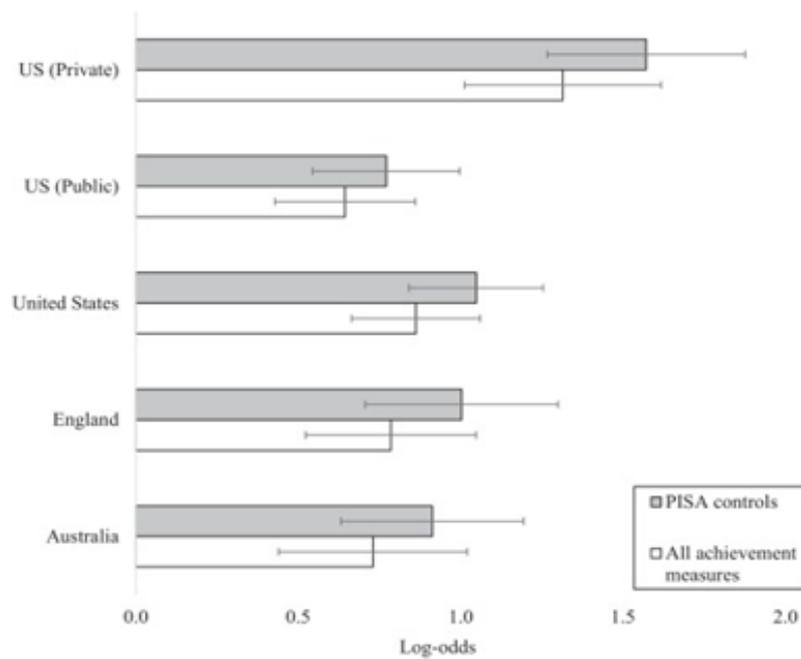
Figure 4. *The direct effect of family background on attending a high-status university: a comparison of results when controlling for different measures of academic achievement.*

As shown in Figure 5, participation rates have been steadily increasing over time, more rapidly for those of deprived backgrounds. The proportion of university-age school students has risen from 29.7% in 2004–05 to 34.4% in 2009–10. However, this increase should be further supported by active and sustained changes.
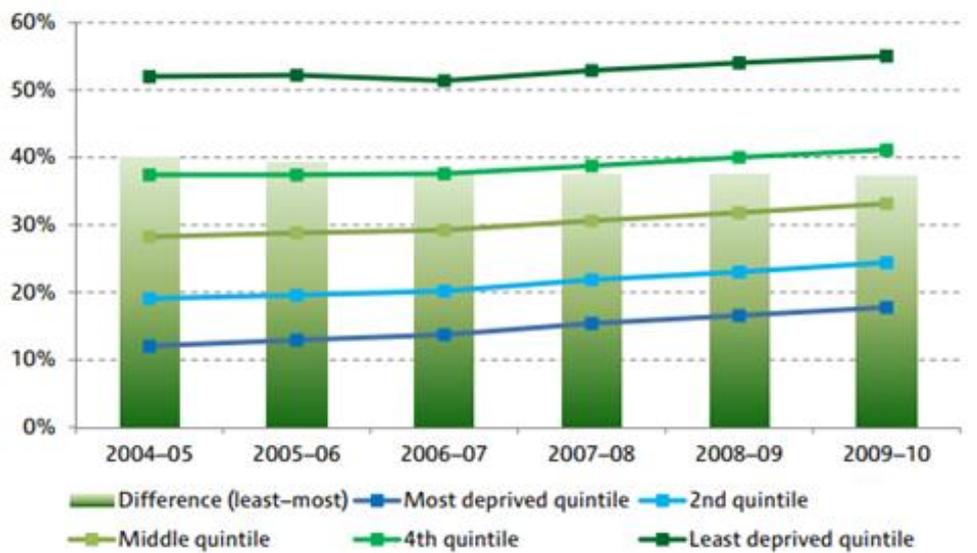
Figure 5. *HE participation at age 18-19 amongst state school students by deprivation quintile*

Universal access for individuals living with disability

Another concern is the exclusion or limitations disabled people face in the educational sector. People with disabilities face injustice and discrimination across the world. The global agenda encompassed Education for All (EFA) initiatives, recognizing the importance of addressing the 600 million disabled people worldwide. According to World Bank estimates, people with disabilities may account for one in five of the world's poorest. Through poverty and lack of education, disabled people are more likely to

experience a chronic circle of discrimination, with exclusion from education representing a factor for poor health, low self-esteem, poverty, higher risk for illness, injury, and impairment (Yeo 2001, p.11).

The definition of disability includes various limitations, such as sight, learning, brain injuries, hearing, attention deficit disorders, medical disabilities, psychiatric disabilities, and speech and language disabilities.

The literature highlights that the prevalence of disability for people with elementary education is 20% higher than in individuals with tertiary education, suggesting that those who have a disability have issues accessing higher education. Although part of the difference, up to 56%, could be attributed to the impact of chronic diseases, some of it might be caused by limitations in the accessibility of higher education.

The Europe 2020 strategy aimed to reduce, by the year 2020, the proportion of people between 18 and 24 of age who leave education and training with lower secondary education to less than 10%. In 2011, one in four people in the EU with a basic activity difficulty (sight, hearing, walking, communicating) faced this situation, compared to less than 13% of those without difficulties. The prevalence of basic activity difficulties at the country level rates from 11% in Sweden to over 60% in Turkey or Bulgaria. When accounting for health problems in the definition of disability, the EU rates of school abandonment raise to up to 31.5%. Romania marks the highest discrepancy, with 71% of those reporting a work limitation caused by disability being early school leavers, compared to only 17% of those without work limitations. In 2011, 30.7% of people between the ages of 15 and 35 with a basic activity difficulty were neither in education or training nor employment in the EU-28, with a 15% higher rate than those without basic activity difficulty. When also considering the people with a long-standing health problem, the prevalence rises to 40.4%.

At the EU-28 level, only 15.5% of disabled persons achieved tertiary education compared to 25% of those without a disability. The countries with the most considerable difference were Belgium, Ireland, and Cyprus.

When it comes to lifelong training, less than 10% of disabled people aged 15-64 participated in education and training compared to about 20% of non-disabled people, with Denmark, Finland, Iceland, Sweden, and Switzerland reporting the highest proportion. Among countries with the lowest participation rates in education and training are Greece, Hungary, Poland, Romania, Slovakia, and Turkey, registering values of around 4% or lower.
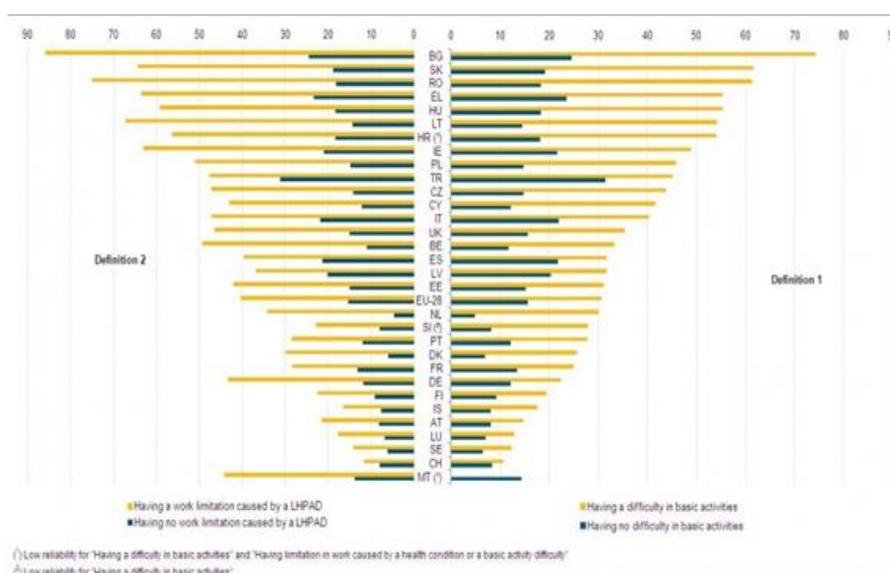
Figure 6. Young people (aged 15-64) not in employment and not in any education, by country and disability status in 2011
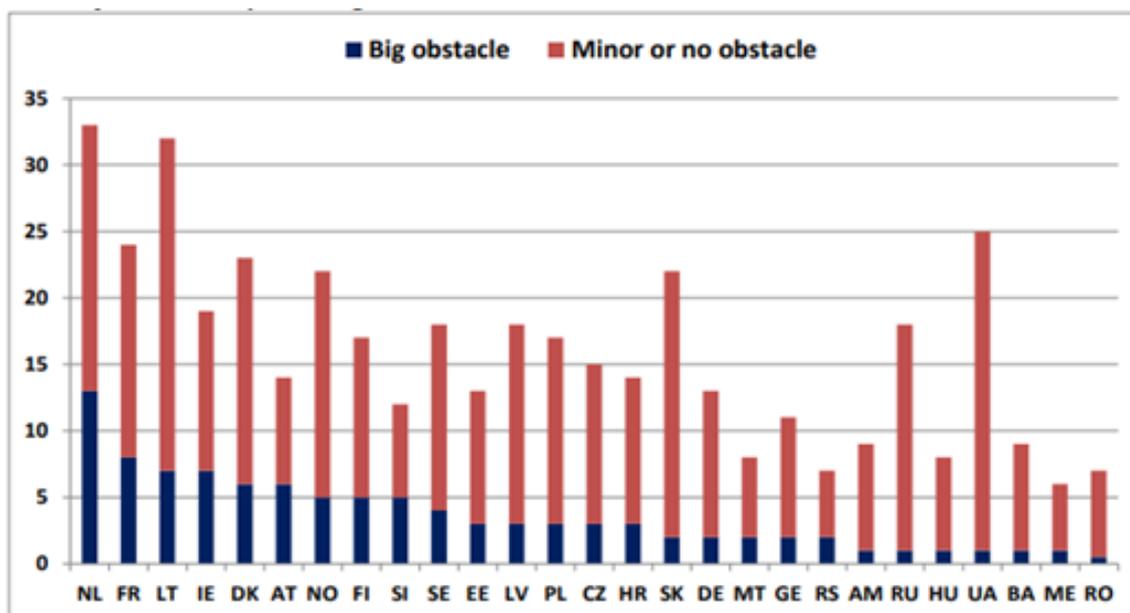
Figure 7. *Students with impairments by self-assessed severity of impairment; Source: DZHW 2015 EUROSTUDENT V A.10, A.13*

Despite these striking differences, disabled students who achieve university education share a success rate in the labor market similar to the rest of the graduate population, according to the Association of Graduate Careers Advisory Services (AGCAS). Overall, tertiary education qualification encompasses an advantage in the labor market, both for disabled and non-disabled people. However, disabled people who lack higher-level qualifications face much worse outcomes in the labor market than non-disabled people with even fewer qualifications. Thus, tertiary education proves to be the most efficient gap-bridger for labor market success for people with disabilities. As a result, there is a strong rhetoric of inclusion at the EU level.

However, many countries fall short in the collection of data, making it difficult to compare progress. The issues faced with The Euro student Survey developed and employed across the European Higher Education Area concern different understandings of disability. Because of this, caution should be considered in data interpretation. However, even considering this limitation, patterns emerge regarding access to higher education, with countries with more robust welfare regimes and less selective education systems succeeding best in the inclusion of disabled students in higher education. There is no one perfect approach. Sweden and the UK are successful examples of countries that have strived to consider inclusion in Higher Education, yet the systems are quite different. The UK also shows good practices in gathering and analyzing data in an intersectoral approach to identify policy interventions.
The main point of these analyses is that one of the fundamental approaches for the disabled population is gathering and processing quality data better, to understand specific and diverse needs and design fitting policies.

Carers

People with caring responsibilities represent one under-discussed minority in higher education. The transition through higher education for this subpopulation can be highly challenging. Caring responsibilities often prevent young people from entering and completing higher education and adding additional academic life struggles. From the Carers Trust, one agreed definition for carers is young people aged 14-25 who care, unpaid, for a friend or family member who could not cope without their support. Some challenges experienced in the inclusion of carers into Higher Education are (1) lack of data on the number of carers, as not all disclose their carer status, (2) carers of young people are often a hidden population, harder to reach, (3) young adults might be deterred from accessing higher education due to their responsibilities, (4) issues with lateness or absence, due to balancing caring

responsibilities with academic commitment, (5) a higher prevalence of self-reported mental health issues. The COVID-19 pandemic context has been especially challenging on the carers' situation, preventing many of them from reaching their full potential.

Most young adult carers struggle to balance studying and caring responsibilities. Support is not always accessible for this population (Carers Trust, 2014). In some cases, carers see a negative impact of their responsibilities on their academic performance, which often translates into consideration for leaving the course. Financial concerns are one big challenge for the population, making access and knowledge about funds and additional support the primary need.

One study highlighted that even though three-quarters of carers explained their caring roles to the universities, 45% of them reported no support from higher education institutions. Young adult carers' opportunities often are restricted, their education often disrupted, and their accessibility to higher education is lower due to the high practical and emotional demands of their caring activities. In the UK alone, over 375,000 young adult carers aged 14-25 provide support and assistance for their families and friends. Over 50% of carers reported a mental health problem due to the effect their responsibilities hold over their health, social life, and self-confidence. Around 29% of carers enrolled in university dropped out due to their role (four times the national average).

A report by the Audit Commission found the likelihood of young adult carers having a NEET (Not in Education, Employment or Training) status for six months or more was twice that of their peers (Audit Commission, 2010). Many of them struggle with the decision of attending university and leaving behind the person they care for, with guilt prevailing in this subpopulation. Some of them might continue to care at a distance or return home regularly to offer help, which might impact their overall experience of university life. Research also highlighted a significant concern for dropping out of college due to finding university life difficult (Becker, F and Becker, S, 2008). The dropout rates are four times greater for carers (Sempik, J and Becker, S, 2014), with only 36% of student carers feeling that they can manage their commitments, compared to 53% of students without caring responsibilities (NUS, 2013). Early interventions are needed for this group, with support being essential throughout the student life cycle, from participation, admission, education and transition to employment.

First-generation students

Increasing attention has been paid during recent years to the "first-generation" university students. Although there are varying definitions, first-generation students are generally described as those for whom "neither parent has had access to university education and completed a degree" (Thomas & Quinn, 2006, p. 50). As the proximal social circle holds significant influence in shaping young adults' perceptions of who might be considering higher education, this issue warrants great consideration.

This pursuit's paramount importance is also the influence the first-generation students can hold within the family, through promoting a culture of learning and encouraging educational aspirations in others, through a "slipstream effect" on their siblings and, in some instances, their parents.

Due to young adults' knowledge being deeply ingrained with familial context, many potential first-generation students might be discouraged by higher education, considering universities "privileged spaces". Although the introduction of university identities might prove a challenging process, it could significantly influence. Even though first-generation students might be considered "at risk of attrition", the evidence provides a counterargument to this, highlighting their role in widening participation and support among under-represented groups. For this to impact, the student needs to become an active mentor to help other family members navigate HE (Spengen, 2013). The downward intergenerational transmission of educational aspiration and social mobility is an essential consideration for developing widening-access practices and an argument for offering targeted and complete support to this subpopulation (Wainwright & Watts, 2021).

Defining key terms

Widening access

Widening access or participation in higher education is a common goal among the 56 countries in the European Higher Education Area. However, a common understanding of this concept has yet to emerge, as it refers both to the number and nature of people participating in Higher Education (HE) and their prospective gains through engaging in higher education. The term "widening participation" or "widening access" represents, however, a central pillar for the higher education agenda, calling for a diversification of the student body.

Increasing participation does not always result in widening participation, despite the phenomenon of HE expansion. Nevertheless, through widening access, patterns of underrepresentation in higher education are addressed. Furthermore, the concept encompasses activities and interventions to create an inclusive HE system that supports people discouraged by social, economic, or institutional barriers who otherwise might not consider learning as an option.

Widening participation is regarded as "removing the barriers to higher education", including financial barriers experimented by the students from lower economic and other under-represented backgrounds (Apampa, Kubacki, Ojha, & Xiang, 2019). There are various interpretations of the concept, and several alternative terms are sometimes used, including "diversity," "inclusion," "equality," and "equity." While some terms, such as diversity, can be used interchangeably, they all encompass different aspects of widening access, including facilitation of entry or equality in legislation. However, the meanings remain context-dependent, with the definitions targeting either economics or cultural capital and shaping policies and interventions to improve access to HE. Since there is no exact way of addressing under-representation, the interpretations of the term can become quite divergent.

Widening participation considers all different stages of the student lifecycle pre-entry, transition, curriculum, student support, and employability. Widening access, inclusion, and participation are critical factors of success in higher education, making significant contributions to the society at large, as well as to the economy, supporting social justice, social mobility, and economic upskilling. Widening participation targets the increase in educational skills while creating opportunities and pathways to higher education.

In NeurotechEU, our focus on widening access has emerged naturally from ongoing struggles for the right to higher education, stemming from liberal concerns of societal fairness, equality, opportunity, and inclusivity (Burke, 2002). Higher education expansion, which has been a great effort over the last decades, shapes the principles of inclusivity and widening of access. With growing diversity, there is an emerging need for personalized educational experiences. Widening access refers not only to equality of access but to the improvement of participation, progress, and employment outcomes. Evidence remains a crucial factor in assessing impact and should be used to inform access plans and outreach projects.

Social Inclusion

Social inclusion at large refers to the "process of improving the terms on which individuals and groups take part in society" (World Bank, n.d). Extending beyond widening participation in higher education, social inclusion can be achieved by improving the opportunities, abilities, and dignities of disadvantaged individuals based on their identity. Every country presents barriers in some groups, limiting their ability to participate to the full potential in political, economic, and social life. The discrimination can be systematic and perpetuated through discriminatory or stigmatizing attitudes, beliefs, or perceptions. Social identity is often an underlying factor for disadvantage, and it can be derived from various aspects, such as "gender, age, location, occupation, race, ethnicity, religion, citizenship status, disability, and sexual orientation and gender identity "(World Bank, n.d.).

Exclusion from society robs individuals of dignity, security, and the opportunity to lead a better life, while the exclusion from education can affect people's economic growth and social equity (2). Unless the root causes of structural exclusion and discrimination are addressed, it will be difficult to support sustainable and inclusive growth.

Social inclusion in higher education is often called "the social dimension of higher education" and refers to the increase in access and degree completion for vulnerable populations and under-represented groups (European Commission, 2019). In addition, it has a positive impact on human capital, innovation capacities, and increasing labor market opportunities. Social inclusion has been discussed since 2001 in the implementation of The Bologna declaration of 19 June 1999 (European Commission, 2019).

The importance of this concept becomes highlighted by the likelihood of under-represented social groups in Higher Education to be lacking necessary skills (literacy, numeracy and digital competence), the experience of independent learning, and clarity about the purpose of higher education. Another argument for inclusion is represented by the unlikelihood of citizens of disadvantaged socioeconomic backgrounds to enter and complete higher education, as well as the issue of gender segregation by study field (European Commission, 2018).

To the youth, social inclusion represents the ability to accomplish self-realization within a society, to achieve recognition of one's potential, acceptance, and integration in the community (Council of Europe, n.d). In addition, social inclusion leads to societal participation through enhancing access to resources, opportunities, self-expression, and respect for rights (United Nations, 2016). However, challenges arise in measuring social inclusion due to its multidimensional nature and lack of standardized data across countries.

Vulnerable populations

In a broad sense, the term "vulnerable" is often attributed to disadvantaged individuals, groups, or communities in our society, who – as a consequence of factors outside their control – might experience limited freedom and capability to self-protect from infringement of fundamental human rights such as education, as well as other inherent risks such as disease or poverty (National Collaborating Center for Determinants of Health, n.d.; Shivayogi, 2013).

Education attainment affects peoples' lives multidimensionally, being directly related to higher income levels and equality. However, as previously described, higher education shows significant gender disparities, with girls and women lagging in many countries, especially in traditionally male-dominated fields, such as STEM education (UNESCO, n.d).

Not only do women face barriers in accessing and finalizing education - a wealth of contexts in which individuals have been seen to be at a disproportionately high risk for limited access to education, issues with participating and finalizing studies, employability, as well as abuse and discrimination of many types. While this is by far not an exhaustive list, the following groups may be considered when devising strategies to address equality and diversity in education and research:
- individuals from lower socio-economic groups, backgrounds, or locations where access and participation to higher education is scarce
- individuals living with disability, mental health issues, or learning difficulties
- international students and staff, as well as individuals with literacy or comprehension difficulties
- ethnic groups or sub-groups
- sexual orientation or gender identities
- older and part-time learners
- residents of rural areas
- care leavers and carers
- traveller community members

- refugees
- first-generation students and people who attend schools and colleges where performance is below the national average
- individuals estranged from their families.

Findings

Methodological note

We conducted a review of both grey and white literature sources such as the European Commission, Eurostat, PubMed, Google Scholar using key search terms like „widening access," „widening participation," „inequities," „higher education." The initial draft of the report was discussed in terms of structure and content and reviewed with participating members from all involved universities during meetings, and feedback was incorporated. This word is a living document to be updated in later stages of consortium development.

Positive action measures

Opportunity access for students (without formal eligibility)

Widening of access to Higher Education could be achieved through the recognition of vocational or professional qualifications or life experiences. Preparatory courses for those without formal eligibility could make for a way of bridging access, as well as improving skills and confidence of prospective students. The approach has been implemented moderately in Europe (Ex: Trinity College Ireland), with about half of the countries partaking (~10% of students access Higher Education via this route). The main focus of Opportunity Oxford is the bridging programme to support students from under-represented backgrounds to make the transition to Oxford through program exploration, the development of high-level academic skills, and insight into life at Oxford (University of Oxford, n.d). Another example would be the Central European University in Hungary, which, until 2017, had a program for Roma students, the "Roma Access Program," targeted at graduate students, with the aim to increase international mobility and support students in continuing with a Master or Ph.D. program, training students' academic competencies in the area of social sciences and humanities and English proficiency (European Commission, 2019). Other countries prefer the approach of entrance exams, which could also level the field for people whose previous academic achievements have been affected by socioeconomic status or other vulnerabilities and could lead to a fairer process, aiding those who were unable to complete formal qualifications, yet possess the skills and desire for higher education, achieve their educational objectives. Furthermore, the recognition of prior experiences could be equivalent to some courses, an approach that had seen success in plenty of countries.

Funding policies: merit-based grants and need-based grants

Grants are one of the most widely applied policies across Europe and show a positive influence on retention and the decision to follow higher education (European Commission, 2019). It is one of the most used and evaluated forms of positive action across Europe, with several evaluation mechanisms in place (BaFoeG, Eurostat). Moreover, grants for those who excel outside of academia would make for a further incentive for those trying to decide if they should pursue higher education and bridge socioeconomic inequities for vulnerable populations.

Organizational policies

These are policies to help students from disadvantaged backgrounds increase academic competencies when entering higher education. The help can come either through the implementation of bridging courses for those who just entered HE or through the introduction of courses in secondary education aimed at future students (mathematics, academic writing), implemented before starting the academic program. In some cases, they became more oriented toward the needs of specific groups (ex: refugees).

For example, in Germany, there are bridging years for refugees (ex: the Technical University of Braunschweig with the project bridge4refugees). In addition, there is a need for individual support structures for 1st-year refugees to increase academic competencies through language training and internships (ex: The University of Applied Science in Frankfurt).

"Refugee Buddies"

The concept refers to volunteers who support refugees in the day-to-day life in higher education. Activities and workshops have been implemented to ease anxiety about studying in a different educational system and academic culture than that from the country of origin. This kind of support group can also be developed and tailored for other disadvantaged populations who might benefit from further integration and support. An implementation of "refugee buddies" can be seen in Denmark since 2016 in collaboration with The Red Cross, reaching 57 out of 98 Danish municipalities (Red Cross EU, n.d).

Provision of consulting services to (prospective) students

Most countries use preparatory courses, but these are rarely aimed at disadvantaged students only. Using networks of volunteers for the provision of consulting services for vulnerable students (especially first-generation students) addresses the gap in support for those who might be most anxious about boarding higher education. In Germany, there is a platform addressing the issue-Arbeiterkind.de-. These initiatives show some impact but cannot guarantee retention or completion, with social integration remaining crucial (European Commission, 2019).

Differentiation and introduction of shorter study programs

One strategy would be an organizational intervention focusing on lowering entrance thresholds for specific groups of students. Shorter study programs would address the risk-averseness of investing energy and resources for a longer duration, especially for working-class students. Furthermore, some of the students might like to test whether they would be successful at HE rather than failing a long program, and for this, shorter and hybrid study programs might be a reasonable opportunity (European Commission, 2019).

Information policies

Information policies are used in some countries (Denmark, Estonia, Germany, Ireland, Italy, England), yet some students might not be familiar with HE and might be risk-averse when considering this pathway. The main areas of informational support would be regarding competencies, opportunities, practices in higher education, and funding opportunities (for students from disadvantaged groups). This represents a valuable approach, especially for first-generation students who might have increased insecurities about the academic experience. An example of implementation is in Ireland, with the 'National Plan for Equity of Access to Higher Education 2015-2019'. Another path for implementation would be through mentors or role models (e.g., Arbeiterkind.de). Mentoring can be done by graduates or students with a similar background who share their experiences and can help with the inclusion of students from disadvantaged backgrounds, offering an opportunity for addressing specific questions, learning more about their strengths and opportunities, as well as improving information on funding and other opportunities (European Commission, 2019). The information could be customized for various groups (e.g., first-generation students, refugees) and delivered in a plenitude of ways (e.g., brochures, website subsections, e-mail newsletters).

One-year stability measure

Stability measures could be used to protect students from significant volatility in the admissions process and ensure the retention of admission places in the context of crises (e.g., COVID-19 pandemic).This can be achieved through employing targeted support for re-skilling in part-time and flexible learning, including shorter credit-bearing courses, as well as through the provision of bridging loans to support students through times of hardship. For the universities, changes in lending terms to support partner

institutions experiencing significant income losses and provide temporary support until a recovery in student numbers could help ease the burden for universities and students alike, by maintaining the main focus on the educational process, even during crises.

Mitigation of gender disparities

There is a noticeable gender gap in the STEM field of higher education, not explained by gender underperformance in respective subjects in lower education (e.g., mathematics, science). A visible gender gap tends to appear in later years of secondary education. One possible issue for this could be the under-representation of female scientists in the media. Furthermore, a report from Harvard Business Review gives valuable insight into the experiences of women in academia, showing that female academics often have their successes discounted and expertise questioned compared to their male peers. Moreover, the "tightrope" effect, where women feel increased pressure to behave in a masculine way as proof of their competency while maintaining their feminine qualities in order to be "likable," exerts higher stress and pressure on the feminine gender. The magnitude of the issue reflects in statistics, with 34.1% of female scientists in one survey reporting a perceived pressure to play a traditionally feminine role, while 53.0% reported backlash for displaying stereotypically masculine behaviors (e.g., speaking their minds, being decisive) (Williams,2015). Moreover, maternity bias represents another limitation, with two-thirds of mothers in academia having their commitment and competencies questioned. These inequities foster frustration, anxiety, and unhealthy competition, with women reporting that they "compete with their female colleagues for the 'woman's spot'". The issue is deeply rooted in societal gender norms and expectations, and approaches for mitigation should be integrated at all levels of education and continues well into the working life.

The "Closing the Gender Gap Accelerator" by the World Forum shares an interesting approach through strategies including the enhancement of social safety nets (e.g., provision of childcare support), as well as encouraging women into management and leadership positions. Some good practices, in the form of financial or social support, include Scientista (campus communities, conferences, online content), Cordis Project (gather, exchange, develop and disseminate ideas of good practices), Girls Who Code (free summer programs and after-school clubs for teen girls), Girl Geek dinners (social support and community), Golden seeds (financial support), and Million Women Mentors.

LGBTQIA+

Many European countries embrace LGBT people, coming at the top of global rankings for LGBT rights, policies, attitudes, with most universities and colleges in Europe having LGBT student societies for support, social events, off-campus socializing (including Pride festivals). IGLYO (International Lesbian, Gay, Bisexual, Transgender, Queer and Intersex Youth and Student Organisation) is a network of over 95 LGBTQI youth and student organisations across Europe. They organise various events and activities (study sessions, training seminars, workshops, conferences), work on developing the skills and knowledge of students, and advocate for LGBTQ rights, producing resources, toolkits, and research. Another positive example is the EMA LGBT Network for students and alumni of Erasmus Mundus Master and Doctoral Programmes oriented towards promoting human rights, tackling discrimination through various activities (e.g., organising events to promote networking and discussions, providing a discussion platform for LGBT Erasmus Mundus students and alumni as well as for heterosexual supporters, mentoring, and networking with other LGBT groups around the globe) (European Commission, 2020). IGLYO created the first LGBTQI Inclusive Education Index and Report as a follow-up to the UNESCO international meeting to provide qualitative data concerning laws, policies, teacher training, and inclusive curricula. Through reviewing progress towards the implementation of inclusive and equitable education for all learners, identifying good practices and planned future actions, and the release of a joint publication of UNESCO with the Council of Europe on education sector response to violence. According to the „Out in the Open" report by UNESCO released in 2016, students who are perceived not to conform to prevailing sexual and gender norms, including LGBTI students, are more vulnerable to being victims of violence (UNESCO, 2018). Research on trans-inclusive education

highlights possible approach mechanisms for inclusion, such as the creation of champion networks or groups for further developing and implementing inclusion work (Mckendry & Lawrence, 2020).

Extension of reach

Online innovation competitions

A good example would be the pan-European hackathon called EuvsVirus. The innovation competition included participants from 40 countries, matched into multidisciplinary teams over the course of a weekend to work together to solve the dire needs of society. The project concluded with 120 projects and 2235 new partnerships all over Europe. This approach could be used to address any topics related to academic life or academic pursuit, from improving the campus and resources to bridging the relationship of students with the work market, as well as tools for evaluation for specific courses. Platforms such as "Slack" can be used for communication, and the prizes could also include internships or collaboration contracts with the stakeholders.

Innovation Bootcamp

The MIT- Harvard Medical School Healthcare Innovation Bootcamp (M.I.T, n.d) is a ten weeks online program based on entrepreneurial activity, problem-solving, healthcare innovation, and leadership. Similar to innovation competition, the boot camps would provide the attendees with more resources and guidelines and shape or improve valuable qualities in students, including creativity, innovation, efficiency, and collaboration, in an exciting and engaging way. The two strategies could be integrated, with a Bootcamp followed by innovation competitions, or taken separately. Some limitations can include attendance fees and coordination, yet, through sponsorships and volunteer help, innovation bootcamps could easily be made more accessible.

Innovation in education

Establishment of a "Nudge Unit"

The Cambridge dictionary defines *nudges* as a way "to encourage or persuade someone to do something in a way that is gentle rather than forceful or direct." In their book "Nudge: Improving Decisions about Health, Wealth, and Happiness", Thaler and Sunstein state that nudges are needed for decisions "that are difficult and rare, for which they do not get prompt feedback, and when they have trouble translating aspects of the situation in terms that they can easily understand" (Thaler & Sunstein, 2008). The history of nudging starts with a Behavioral Insights Team or "Nudge Unit" developed in the UK, intending to develop policies based on behavioral psychology that are cost-effective and bring on high societal impact with a low intrusion. This approach does not try to adapt humans to the policies but instead adopts policies to the natural behaviors of humans. After the unit's success, organizations and governments around the globe have established "Nudge Units", approaching issues related to self-control (trade-off between immediate costs and future benefits), adverse reaction of having too many alternatives, societal norms, and loss aversion, among others (Halpern & Service, 2019). The academic world seems to embrace this approach by adopting policies that would "predictably alter people's behaviours without forbidding any options or significantly changing their economic incentives" (Damgaard & Nielsen, 2018). The nudges can take the form of e-mail, texts, or alerts aiming at encouraging students to complete tasks (e.g., completing enrollment or attending office hours). An example of implementation of nudging would be the MineduLAB in Peru, a "nudge unit" within the Ministry of Education. As far as the implementation in the context of NeurotechEU, establishing a "Nudge Unit", or at least the act of incorporating the concept of nudging to improve the educational or management process, could prove to be a low-cost and high-reward decision. Some aspects in which NeurotechEU would highly benefit from this concept, especially in its' early steps, would be enrollment, student retention, and ease of communication.

University dropout prediction models through neural networks & educational data mining, multilayer perceptron algorithms (96.3% prediction rate), and radial basis function (96.8% p.r) approaches can be

methods of predicting student dropout at the universities, indicating the reliability of neural network models in identifying students at risk of dropping out. This approach uses demographic and student behavior data, information on education methodologies of the universities, academic data, and socioeconomic variables (Alban, & Mauricio, 2019). Two data mining models using two classification techniques (naïve Bayes and a decision tree classifier) showed high efficacy in predicting decisions and low academic performance under different scenarios. This approach uses admission data, as well as academic information, and is supported by literature (Lopez Guarin, Guzman & Gonzalez, 2015).

The impact of the covid-19 pandemic on widening participation in higher education

Platforms for Massive Online courses

The platforms for Massive Online Courses could make for a vital resource in the context of online learning and can offer greater recognition for e-learning in higher institutions. India provides access to Massive Open Online Courses (MOOCs) through the "*Study Webs of Active Learning for Young Aspiring Minds* (SWAYAM)" platform. Students can transfer up to 20% of credits from relevant online courses completed on the platform, proving to be a successful initiative, with e-content for 933 Courses for Undergraduates in 67 Subjects and 77 Post Graduate subjects (Kanjilal & Kaul, 2016). In the context of Neurotech[EU], credit transfer could be an efficient tool, as it would encourage students to follow their interests and preferred mode of learning, ensure more flexibility, and personalize the learning experience.

Chat-bots

Chatbots are helping students receive essential information in an accessible way without having to repeat their needs to the staff, proving to be reliable "temperature-takers", while also aiding in increasing efficacy (e.g., it can reveal that the school website's language is not clear and needs updating). One need is to address privacy issues early. A proper procedure is to deliver HE chatbots in applications already used by students (ex: WhatsApp) to ease access. However, technology should be built to promote human interactions rather than being a substitute for them. It should be promoted as a first resort and continuously evaluated through mixed methods. This could be useful for delivering information about grants, schedules, faculty news, and reminders to all students (UNESCO, 2020; Sjöström, Aghaee, Dahlin, & Ågerfalk, 2018).

Conversational intelligent tutoring system (CITS)

One study proposes a generic methodology and architecture for developing a CITS named Oscar that is able to lead a tutoring conversation and to dynamically predict and adapt to a student's learning style. It mimics a human tutor by modelling the learning style while tutoring and "personalizing the tutorial to boost confidence and improve the effectiveness of the learning experience". Students can discuss topics in natural language for a more comfortable and approachable experience. Studies on real-life students validate the predictions of learning styles, with all learning styles in the ILS models being predicted successfully from a natural language tutoring conversation, at an accuracy of 61-100%, providing a 13% average learning gain for participants (Latham, et al., 2012). In the context of Neurotech[EU], these tutoring systems could help students facing language barriers, learning difficulties, or even social anxieties overcome shortcomings and provide personalized learning experiences. An investment in CITS could help bridge economic concerns and bridge inequities in higher education.

Teaching through social media

A systematic analysis on the use of Twitter for educational purposes (especially in American and European higher education) shows Twitter to be a useful tool for communication due to its' high

accessibility, novelty, and real-time format. Use of Twitter for educational purposes has been shown to enhance students' learning capabilities, improve motivation and engagement, and ease collaboration with the teaching staff. One study incorporated Twitter and blogs into two undergraduate courses in Malawi. Data were collected through an analysis of blog and Twitter posts by students and a questionnaire on student perception. The authors of the study communicated lecture notes, feedback, and class cancellations. The results were positive, as Twitter and blogs promoted a learner-centered approach to teaching and eased communication. The tweets were mainly used for communication and content sharing. In the final questionnaire, the students either agreed or strongly agreed that they benefitted from Twitter "through interactive learning, instant communication and independent learning" (Chawinga, 2017). Possible limitations that should be addressed early on include inappropriate usage, overexposure, information overload, and privacy issues, internet costs, poor connection, or insufficient computers (Malik, Heyman-Schrum & Johri, 2019). The benefit of blogs includes reflection on learning material and learning experience. Twitter and other social platforms could be used in the context of NeurotechEU, both for promotion and advertising and for interaction with students. More than that, it could create a more relaxed environment, allow students to participate more in educational activities, and create a community.

Game-based learning

A study on the use of game-based learning (GBL) in undergraduate settings, with an extensive data set (n=440), showed that games increased reported enjoyment levels, especially in students who were most anxious about learning, and further showed the increase in enjoyment to be correlated with improvements in deep learning and higher-order thinking (Crocco, Offenholley, & Hernandez, 2016). Furthermore, revenue from GBL is projected at around $24 billion by 2024 (eCampus news, 2019), showing a growing interest in this educational aid. As far as implementation goes, the American University Washington DC holds the "American University Game Lab", which is "a hub for experiential education, persuasive play, research, and innovative production in the fields of games for change and purposeful play" (University of Michigan Library, n.d), providing a positive example of good practice. Other examples of implementation include The Centre for Learning through Games and Simulations at Central Michigan University, and the Game-based Education and Advanced Research Studies (GEARS) Lab in Florida. It is, without doubt, a direction worth consideration, especially in a domain as complex and engaging as neurosciences. It could be used as a strategy for teaching, but also a learning path (master, short program) could be developed. In this context, the technology works with educational sciences, psychology, and design to create a wholesome personalized experience for students from the most "tech-savvy" generations. Although it might be encountered with some skepticism, as it could be seen as not professional, this might be the true future of the educational process. Furthermore, game-based learning can provide valuable training in a wide range of skills, provide flexibility, and bridge inequities in the learning experience, as it can be modelled and adapted for students with particular needs.

Gamification in Higher Education

Gamification could be implemented through a wide array of tools (quizzes, discussion boards, jeopardy, classroom response system, scavengers hunt, bingo, mixed company, immediate feedback assessment technique, Kahoot). This approach would help the diversification and natural retention of information and could also prove to be a valuable aid, in the context of e-learning, for the mental health of students and staff. Mental stimulation might be less than in the context of face-to-face interactions for many students and staff. For this, gamification might bring a sense of better social interaction and connection. In addition, other tools such as Duolingo, Minecraft, SecondLife, Coursera, gamescape might come as aids for students trying to learn new skills in a more immersive way. Coursera even offers gamification courses, and so does LinkedIn Learning, which could become helpful aids for teachers. Moreover, an excellent resource would be The Gamification Toolkit offered by Wharton. Some examples of implementation include the University of Lüneburg's Gamification Lab (Germany) and the University of Rome's GamificationLab Sapienza (Italy). A study looking into the implementation of gamification as an

educational tool, both in an online and offline context (Sanmugam et al., 2015), revealed several successes in offline gamification. However, online gamification faced some issues with disengagement and an improper reward system. Despite the many benefits of gamification, it can only work through proper implementation, and it will face a lot of trial and error to figure out the best approach, as it is a relatively new concept. In Neurotech[EU], gamification could be an exciting element for new students, and it could increase motivation and excitement about programs and create a sense of community.

Assessment in times of COVID-19

University assessment remains a big issue in times of pandemics. Firstly, exams are moved online, which in itself can be troublesome. Secondly, we should consider tweaking and adapting assessments for those most impacted by the circumstances. The most commonly employed strategy in times of crisis so far, including during the COVID-19 pandemic, regarding examination, is to postpone or reschedule exams. High-stake exams should be replaced with formative assessments in order to promote learning and educational progress during the crisis. Furthermore, this approach is promising in controlling for teacher bias, as the grading focuses on evidence of student achievement over time rather than performance during the test (UNESCO,2020). This could be a helpful strategy in the context of the pandemic, but, even outside of this context, it could ease the stress from high-stake exams and make for a more fair assessment of the students, as high-stake exams might not reflect students' actual capabilities, as much as their ability to work under stress. St George's University of London shares some suggestions on improving the evaluation process. Removing some assessments and replacing exams with coursework or online assessment represents the first point on the list. Secondly, removing rigid time constraints is a point that should be accounted for as an extension of registration periods. Formative continuous assessment can be used for gauging ongoing progress by identifying students' strengths and weaknesses. Moreover, assessment of the COVID-19 impact on grades is critical. This can be done through comparison with previous years. Finally, a revised mitigating circumstances policy should be put in place and followed, as the needs of the students vary. The principles for alternative assessment of the University should revolve around accessibility, transparency, consistency, and the ability to be manageable for staff. Holding a framework for online education and embedding a roadmap to implementation into the website could be added approaches. Setford, a network for legal advising, informs students on mitigating, extenuated, and exceptional circumstances under the equality Act 2010. Access to this kind of information should be readily available for students, as blanket solutions such as adjusting the pass mark might not be the panacea we expect. Universities should work to assess, to their best ability, a case-by-case scenario. Increasing all the grades or changing the marks for everyone might be discriminatory to some students facing debilitating circumstances (anxiety disorder, those who contracted the disease, students with dependent children).

University recruitment in time of a pandemic

The European Association for International Students reveals, in a poll, that 77% of audience members expected international student enrollment numbers to be 'somewhat lower' or 'significantly lower' than in 2019, while 83% of the international education professionals expect international student numbers to decrease in 2020. The main concerns were the closing of the borders and the overwhelming of visa offices. However, the issues were expected to be resolved by 2021, supported by a shift towards online resources and innovation, including digital recruitment, counseling, and communication. A successful practice in the digital world would be tracking and optimizing conversion rates in prospective students. Times Higher Education (THE) comes up with a handful of strategies supporting student recruitment in times of pandemic. The first one mentioned in the tweaking of communication strategies to foster community spirit and reduce fears. The main idea would be that many potential students might be anxious about continuing their studies and could start considering options closer to home. THE also suggests keeping communication with students at all stages of the recruitment pipeline and creating a sense of community. Moreover, sharing and promotion of these strategies make for a vital step. Furthermore, enhancing the online presence of the University becomes of great importance as social distancing becomes the norm. Some steps into this process would be shifting the budget towards

increasing online promotion, a promotional boost for new programs or those reliant on international students, enhancing social media activity and updates, and, finally, focusing on promoting online flexible degrees. This online switch is vital for the recruitment of the "digitally natives" generations. When looking at international admissions, one crucial step is to consider the countries with already successfully recruitment. Subsequently, there is a need for considering cultural differences in designing, wording and tailoring the message in the context of the global crisis, underlining opportunities, and considering the needs of prospective students. Social media is of great importance for new students, with Instagram representing an excellent place for universities to engage with prospective students, share alumni stories and provide tips. An example of good practices is represented by the University of Queensland, which, through its' Instagram account, shares study-from-home tips, empathizing with the students. Another good example is represented by Indiana University, which is re-sharing videos from its students' time at home. This ensures connection with students and prospective students in an authentic manner.

Universal access

Mental health strategies for students

Mental health is one main issue that arises in uncommon situations, such as that of the pandemic. Research on the pandemic mental health implication has shown an increasing prevalence of mental health problems such as depression and anxiety among the general public (Knolle, Ronan, & Murray, 2020). College students are at increased risk as they already face higher levels of psychological distress outside the pandemic context (Yang, Chen, & Chen, 2021). Increasing academic stress in a population with heightened pre-existing stress levels and a potentially reduced ability to rely on typical coping strategies (e.g., family who themselves may be experiencing heightened distress) (43). A study on the impact of COVID-19 on student education and well-being revealed anxiety symptoms in 25% of their sample (Schwartz, 2020). Surveys, including one by YoungMinds, reported a worsening of pre-existing mental health conditions, under pandemic circumstances, in 83% of young respondents. The reasons were mainly related to school closures, restricted social connections, and loss of routine.

The University of Colombia shows one example of best practices through the Centre for Students Wellness. The Centre offers plenty of Mental Health Services (MHS). Among these facile telephone appointments to a physician through their health portal, extensive referral network that consults students and links them with providers in the community (clinicians of color, queer-identified clinicians, clinicians trained in various modalities). Students can also connect with the Centre by e-mail, or by phone, for urgent medical or mental health concerns. Furthermore, they hold MHS virtual groups and workshops, with themes varying from overcoming depression, healthy relationships with food to overcoming loss. Moreover, they present virtual gathering spaces for minorities (Asian identified students, black identified students, LGBTQ, and international students), where facilitators will link students to treatment providers at MHS or in the community. They further developed a mental health guide, which assesses different types of stress responses and provides strategies and various tips on day-structuring, social media, and social connection, as well as valuable resources and connections to mental health services. Another example of good practices would be from the California Department for Education, which links students to different crisis lines, including LGBT line and a text crisis line. This might be vital for students who may live with abusive families or partners or who are not comfortable with phone calls.

Educators should follow courses to be able to recognize mental health warning signs in students. They should have clear referral mechanisms set up linking students to teachers, mental health professionals, and social workers and enable them to easily access crisis support. Furthermore, promoting social and emotional competencies among students through various online courses can prove a valuable approach. Online platforms such as GritX (50)-which provide mental health care and a space to connect and share stories- should be promoted for students and staff while also providing support for students who cannot afford specialized mental health services.

Revolution in studying medicine

Although this section mainly refers to medical students, plenty of other specializations are under threat in exclusive e-learning. Some specializations are easier to be held exclusively online, while others face significant concerns. Medical, technical, and other students require constant practical training, vital for their future job. It would be detrimental both to the students and society for them to go out in the work market without the needed skills. Therefore, there is a need to adapt beyond the emergency response and restructure the educational process safely and effectively. One consideration that should be made is related to students' safety and well-being. Medical students report anxiety and uncertainty about personal safety and the continuation of the learning experience (Alsoufi, 2020). In addition, specific issues such as graduation timeline, housing, and financial insecurity plague the students, having unfortunate consequences. In order to handle these stressors, student advising services should be emphasized more than ever and enhanced as a primary concern in the educational process.

One example of good practices would be the UBC Faculty of Medicine in Canada, which set up two rapid-response teams at the outset (COVID-19 advisory working group and the undergraduate medical education COVID-19 task force). The former was responsible for making recommendations for educational adaptations, while the latter worked on implementation. The task force was comprised of the undergraduate associate dean and a regional associate dean, student representatives from all years and campuses, and multidisciplinary faculty members and administrative staff. The reasoning behind this approach was to empower the students who can take an active role in handling the situation and re-establishing the feeling of control. The coordination was supported by multimodal communication through e-mail, YouTube video messages, and website postings. Another main point of their approach was the early engagement of internal (university administration) and external (health authorities) stakeholders.

In the pandemic situation, the medical curriculum should be flexible, as should be that of any other specialities. Flexibility should come both in delivery and administration, and implementing innovation should be a primary concern. However, all measures should be considered for ensuring compliance with accreditation standards. Close contact with other universities for the exchange of best practices, support and innovation is crucial.

One faculty transitioned all in-person classes online in a few days and expanded their video delivery platform already in place for their provincially distributed medical education program. Video conferencing was used for case-based learning, YouTube teaching videos, mobile apps, and previously recorded didactic sessions. Another faculty replaced clinical clerkship for year three students with flexible learning experience projects (e.g., replaced two weeks of electives with a public health module or research projects for year four students). Furthermore, they work with the BC COVID-19 Medical Student Response Team on non-contact public health activities (contact tracing, staffing telephone hotlines and call centres, performing background literature research for public health). As far as evaluation goes, they have switched portfolio sessions to online delivery, and multiple-choice examinations are now delivered online. They also delivered the first online objective structured clinical examination (OSCE) to the final year students and deferred it for students in the remaining years. As the British Columbia Medical Journal highlights in an article on Lessons from the Pandemic, it is essential to see things in the long term. Although rapid adaptations, such as online instructions, are of great importance, we should plan for the long term to support medical education. Another impact of this pandemic should be the introduction of pandemic preparedness in the medical curriculum. Telemedicine technologies should be taken into account. One example would be the use of tablet computers (cleaned between patients) used at sites with high risk for transmission of COVID-19. In this approach, patients are given tablets and isolated in exam rooms, after which students and physicians can safely communicate without risking exposure or wasting protective equipment, with a learning aim (Mian, & Khan, 2020). In this way, students get access to clinical learning and, at the same time, aid the medical system by reducing the burden of the disease by triage. The idea would be to make telemedicine mainstream in the following

years. A mixed-methods review has found the telemedicine interaction of undergraduate medical students to be a source of improvement for core competencies such as medical knowledge and patient care (Waseh & Dicker, 2019).

Another look into best practices happens at the Imperial College London, where students gained access to an online repository of patient interview recordings and cases. Imperial clinicians deliver tele-teaching through computers on hospital sites. This approach has seen excellent attendance and interaction. Finally, we should consider virtual laboratories as an alternative to in-person ones, both in the context of the pandemic but not exclusively. However, virtual laboratories should not, at least not for now, come as a replacement for live-tissue ones. Some studies show that, despite all innovation, live patient interaction is more effective than only problem-based learning or e-module. Nevertheless, studies conducted at Emroy University on case-based genetics virtual laboratory sessions for first-year medical students allowed students to apply fundamental knowledge in diagnostic settings. The success was outstanding, with 92% of the students agreeing or strongly agreeing with the session's educational value. Another study showed that simulation-based learning improves students' learning, intrinsic motivation, and self-efficacy, as well as the perceived relevance of medical, educational activities). An excellent example of innovative simulation would be a 360° "simulation of the cytoplasmic space for a bacterium and 3D visualization of its components from the perspective of an internal observer" (Bidaki, 2018). Virtual labs could have a significant impact if they were formally integrated into the first-year curriculum. Results of studies generally point towards a combination of natural experimentation and virtual experimentation to increase the students' understanding, proving to be more efficient than virtual experimentation alone (Zacharia, 2007). There could be spaces where students can virtually prepare for laboratories or experiments and then perform them on living tissues faster, more smoothly, and while using fewer materials (Wang, Liu, Ma, 2018).

Disability in higher education

According to the European disability forum, over 100 million persons are living with disabilities in the European Union. The UN Convention states that: "people with disabilities include those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others" (European Disability Forum, n.d). In Member States of the WHO European Region, 6 to 10 out of every 100 people live with a disability. However, it is estimated that only 8-14% of all students in post-secondary education institutes in the US and Great Britain are students with disabilities. In comparison, in these countries, over 18% of working-age people are disabled (Americans with Disabilities: 2002 report). For this vulnerable population, studies revealed low enrollment and high first-year dropout (Mpofu & Wilson, 2004), which could be the result of inadequate accessibility, lack of support, adverse social attitudes and social isolation, and low financial capacity.

Some initiatives on the matter include ZeroProject, a platform that gathers the most effective and innovative solutions for people living with disabilities, and TechMatrix, a website presenting a wide array of assistive and educational technology tools and resources tailored for the learning needs of students with a disability, as well as their classmates. Furthermore, the European Disability Forum designed, among others, some basic guidelines for web accessibility, as well as guidelines for accessibility for a physical meeting. They developed recommendations for the EU and its institutions.

Learning and language	Physical
Snap&Read (e.g., Donjohnston)	Adaptative seating
Graphic organizers (e.g., Inspiration)	Speech recognition software (e.g., MathTalk)
Pentop Computers	Mobile apps (e.g., Say Hi! AAC, TalkBoard)
Math drills (e.g., MathTrek 1,2,3)	Softwares (e.g., Grid 3, Co: Writer, Dwell Clicker 2)
Mobile apps (e.g., Ghotit)	
Text to speech (e.g., Kurzweil 3000)	

Speech to text (e.g., Dragon Naturally Speaking) Word prediction (e.g., WordQ) Pronunciation Dictionary (e.g., Howjsay) Audiobooks (e.g., Learning Ally) Spelling aids (e.g., Easy Spelling aid) Softwares (e.g., Livescribe, Ghotit Real Writer, Mindreading, JobInterview Training) Gamification (e.g., Habit RPG)	
Visual Screen readers (e.g., Jaws, Voice Brief) Mobile apps (e.g., Ariadne GPS) Refreshable Braille Display Optical Character Recognition (OCR) Systems Video Magnifiers (e.g., ZoomText) Closed-Circuit Televisions Softwares (e.g., VoiceOver)	**Hearing** Frequency Modulation (FM) Systems Sip-And-Puff Systems Classroom sound-field system Record & Transcribe (e.g., Dragon Dictation) Softwares (e.g., Purple, Dragon)

Staff training is a vital part of implementing strategies for disabled students. Specialized training programs, as well as constant support, should be available for all teaching staff, in addition to the Online Staff Performance Management System. As a first step into expanding educators' knowledge and capabilities in working with students with a disability, online training modules could be of great importance (e.g., Iriscenter overview of assistive technology (AT) for teacher training). Consequently, a shifting focus toward greater flexibility, with the possibility of extending deadlines, might be needed. Providing more time for them would potentially decrease drop-out rates and ensure loyalty. "Virtual Visitas", supported by Harvard, is a good alternative for large events uniting recently admitted students. Campus tours, webinars, and information sessions are another great tool for bridging inequities widening access, allowing students to develop a sense of community without physical presence. Video content, e-mail marketing, and the use of education "freebies", such as college checklists, are excellent ways of engaging with the target group. Organizational aspects shall be carefully planned to implement sustainable good practices while respecting legislation and policies. The lack of familiarity with certain technologies documented in the good practices might lead to logistical issues for staff, while the logistics of continuous evaluation can represent another limitation. Feasibility should be considered firstly, as the implementation of practices can be vastly different, depending on the environment. Lastly, the context of the pandemic and possible future crises affects, to a smaller or greater degree, the availability of resources and the possibility of implementation.

Best practice examples from NeurotechEU partners

Preparatory study program for refugee students
Radboud Universiteit (The Netherlands)

Background

The NeurotechEU consortium strives to offer an inclusive and safe environment to a diverse staff and student population. Radboud University is eager to contribute to that aim as it aligns with our origin and mission statement: Radboud University contributes to a healthy, free world with equal opportunities for all. Radboud University is a broad, internationally oriented research university in Nijmegen, the Netherlands, that performs research and provides education across nearly all scientific disciplines. It is connected to the Radboud University Medical Centre. The university employs around 5,600 FTE and provides education for around 24,000 students.

The university owes its origins to the Catholic emancipation movement of the early twentieth century. In keeping with this tradition, staff and students feel a commitment to one another, to society, and the world. Our focus is on caring for each other and the world around us. We remain committed to the empowerment of social and cultural minorities. We want to have an impact, and in this, we are guided by academic questions and societal challenges.

Traditionally an emancipatory university, until today, Radboud University receives many 1st generation students, larger than the national average. We aim to make all education (and all buildings) accessible to all students and all staff and provide an inclusive campus, e.g., by striving for a bilingual campus. Special support is available to students with special needs: the university offers possibilities for 'flexible studying' for students with a disability, chronic illness, or students who must take care of relatives, and a preparatory program for refugee students. An active gender policy is in place, and a Diversity, Equity, and Inclusion (DEI) strategist supports the processes of widening access to study and work at Radboud University.

Here are two examples of the action lines initiated at Radboud University to further enhance equal opportunities for all:

Gender diversity policy: enhancing the number of female professors at Radboud University

In the Dutch discussions on science policy in recent years, the main issue has been the uneven distribution of male and female scientific staff, particularly in the higher scientific positions. For instance, the 2025 Vision for Science argues, "Dutch science is failing to make full use of female talent, particularly in more senior positions."[1] This report acknowledges that, in this respect, the Netherlands is "lagging behind most other European member states"[2]

Radboud University has long been one of the pioneers in the domain of gender equality in Dutch academia. This can in part be traced back to its original mission and identity as an 'emancipation university.' In recent decades, this notion of emancipation has been extended, inter alia, to include the emancipation of women. Furthermore, Radboud University has been a prominent university in the field of gender studies in the Netherlands.

Radboud University emphasizes (gender) diversity as an important spearhead; it has been implemented in the HR agenda, and to encourage gender and international diversity, there is an extensive diversity policy in place: the Christine Mohrmann program. This program is named after Prof. Christine

Mohrmann, who was the first female professor at Radboud University and contributed greatly to equal rights and women's liberation within the academic world.

The Christine Mohrmann Program is intended to promote gender equality at all levels among the university's academic and support staff. Other aspects and types of diversity (such as age, cultural background, and sexual orientation) will follow. The program is based on the following pillars:
- The recruitment, selection, and professional development of staff members
- Raising awareness and the role of supervisors
- Support and connection through facilities and employment schemes that allow for a balanced personal and professional life
- Diversity networks
- International staff members

The first pillar stimulates gender equity and international diversity through extra attention to recruitment. The pillar is supported by a special fund – the Christine Mohrmann Fund. It finances targeted activities related to the recruitment of female professors as well as the selection, development, and mentoring of young talent, e.g., special fellowships in the form of tenure tracks or career tracks, various mentoring programs for talented (male and female) academic staff, as well as the special Mohrmann stipends for female PhDs; yearly ten grants are handed out to encourage female Ph.D. candidates.

Furthermore, Radboud University pays attention to professionalizing the recruitment and selection process so that talented employees can be recruited and selected regardless of gender.
This includes revising recruitment checklists and protocols, which specify a good spread of the candidates to be invited and the composition of committees, as well as training, aimed at raising awareness of unconscious (biased) assessment processes during recruitment and selection. Vacancy texts are also made attractive to the widest possible target group by means of a uniform and neutral recruitment text and attention to the diversity policy.

The second pillar generates awareness to create a culture of diversity, where everybody feels welcome, has room for personal development, and feels part of the university. The supervisory staff plays a key role in this. As such, to stimulate their awareness, present and future supervisory staff undergo training, which for instance, at the Donders Institute led to a Gender Policy and Action Plan with concrete actions, deadlines, and division of tasks. In addition, the university is currently screening all information and communication for gender-biased framings and word use. Similarly, all new buildings on campus have been named after female scholars and academics.

The third pillar supports working conditions that allow for a healthy combination of family life and an academic career. Measures include support for parental leave and career breaks, increased level of childcare facilities, and replacements in the case of pregnancy leave. In addition, the university pays attention to dual-career issues and assists partners of recruited (international) professors in finding jobs, as well as helping the family find housing, childcare, etc.

The fourth pillar supports the visibility and development of various networks on campus in support of gender and diversity. These include the Ph.D. network Promovendi Overleg Nijmegen, the network for temporary academic personnel, the Radboud Network of Women Full Professors, the Halkes Women Faculty Network Nijmegen (for female academics and scientists from Ph.D. to senior lecturers), the Secretaries Network and the Platform Jonge Honden (for all young employees). Meetings and activities are supported through the initiative.

Last but not least, the **fifth pillar** gives attention to intercultural communication and a bilingual campus in order to ensure positive introduction and support of (new) international staff members. There is a

central meeting place at the campus where international staff can come with questions: the Global Lounge and the International Staff Information Desk. In addition, other programs are in place to stimulate international staff to come and work at Radboud University, such as the Radboud Excellence Initiative.

Benefits with the practice

Radboud University's active policy has led to the following result: the gender imbalance at the university has shifted significantly during the lifetime of the Christine Mohrmann program. Overall, the university has gone from 17,2 per cent female professors in 2009 to 29,6% female professors in 2019[3]. Thus, Radboud University is doing better than the Dutch average (24,2%) and ranks 3rd among the Dutch universities. Meantime Radboud University has achieved its goal of 30% female professors in 2020. Therefore recently, a new target of 36% female professors in 2025 has been set.

Sustaining the practice

The many networks established and their ongoing activities help make the program visible. In addition, the program was developed through a mobilizing and consultation process with internal and external stakeholders. Other elements stand out as sustaining the practice:

a. Effectively leveraging national concerns, programs and discourse on the gender issue
b. Gender issues and the program is a strategic priority, supported by the board and top management
c. Measures in the program are based on scientific research, including in-house research
d. Financial support for measures through the Christine Mohrmann fund
e. A well-developed package of many practices all geared to achieve gender equality, as well as diversity
f. Distributed organization, where central HR is in charge but linked clearly to relevant units at the faculty level
g. Well-developed routines to curb bias in supervision and in recruitment
h. Faculties agree on target quota for women researchers

The organisation, the development and transferability of the practice

The organizational home of the Christine Morhmann program is central HR, where an HR expert oversees the daily operations of the program. Other than that, the program is integrated into the routines of the organization, and departments draw resources from central HR in case of, e.g., recruitments. Additionally, the program relies on the many networks tied to it.

The program was initiated in 2013, responding to national discussions of the marked gender imbalance in Dutch academia in the early 2010s. It took around a year to mobilize adherents at the faculty level throughout the university and to develop the core measures and initiatives in the program. To this end, the Radboud University research group on gender played an important role, as the measures used are based on scientific research. During this phase, the team also consulted with other universities, and networks were developed. Contact was made with, e.g., the Dutch Network of Women Professors (LNVH).[4] These networks were consulted during the program development, as were expat organizations and experts in the university's HR department.

While the program is encompassing, the core of the program was set up in only one year. The success of the program hinges upon top management support and appears to match the organizational culture of Radboud University well. The program also has support from accomplished researchers in gender and diversity at the university, but in principle, no element of the program appears idiosyncratic to the organization. Hence, with a dedicated team, who can mobilize adherents and clear top management support, the program should be transferable to other research organizations.

Diversity policy: preparatory study program for refugee students at Radboud University

For students with a refugee background, taking the step to higher education in the Netherlands is often difficult. This is because they are accustomed to a different education system or because their previous education does not match the admission requirements. Reasons may be multifold: some fled their country of origin during their studies and did not have the necessary diplomas. Others cannot access their official documents or lost necessary certificates on their often-turbulent way to a safe haven. Alternatively, in other cases, their diplomas do not give direct access to Dutch universities.

To bridge this gap between previous education and the entrance level of the university, in September 2019, Radboud University started a pilot preparatory study program for refugees. An intensive, individualized course enables highly skilled and talented refugees to prepare effectively for a university degree program at Radboud University or another Dutch university.

This initiative fits in with Radboud's identity as an 'emancipation university.' Or as Daniël Wigboldus, President of the Executive Board of Radboud University, put it: "Highly educated and talented refugees deserve the opportunity to retrain and continue their education so that they can acquire a role in Dutch society that does justice to their capabilities and motivation. Radboud University wants to contribute to a healthy, free world with equal opportunities for everyone. From our academic background, we pay special attention to students and staff who are forced to seek refuge in our region."

The intensive study program focuses on Dutch and English language skills, specific subject content (often statistics), and academic study skills intended to enable refugees to make a smooth start to their studies. In addition to the individualized preparatory course, personal guidance is possible, and all participants are linked to a 'buddy' – a student from Radboud University who is preferably enrolled in the same degree program that the refugee students are aiming for. Both students, the refugee and the buddy receive training from UAF so they can both get the most out of this experience. Furthermore, Radboud Universities offers them a special card that gives access to all sports and cultural courses for students at the university. This should encourage and support the refugee students to enlarge their network.

The organisation, the development and transferability of the practice

The program was developed in close consultation with UAF, Foundation for Refugee Students in the Netherlands, and other Dutch higher education institutions that offer similar courses. Because this preparatory education is not covered by the national student finance scheme, UAF finances part of the tuition fees, material costs, and travel expenses for the participating students.

The program is centrally managed by an officer within the Student Affairs department. Based on identified needs, it could be reproduced by other organizations, after mapping the demands in their environment and while considering features of the relevant education system and financing schemes.

The program started recently, and it will take time before any results manifest. The group of refugees for whom this program is suitable is limited. Mainly because candidates must be able to gain within one or maximum two years of preparation the necessary knowledge and skills to start and successfully complete an academic study program. Therefore, the selection procedure is very strict, considering preliminary education, motivation, ability to reflect on study choices and the study process, as well as some test results (English, Dutch, mathematics).

Fortunately, several trajectories are available in the Netherlands for refugees at different levels. If a student does not qualify for an academic study program at Radboud University, he or she receives tailored advice for other possible options. The responsible officer has good contacts with other educational institutes and, if appropriate, can redirect the students to other, more suitable for the programs.

Relevance and recommendations for NeurotechEU

- To develop a clear policy identifying different stages and accompanying (measurable) targets
- To seek input and support from both internal and external stakeholders
- To create awareness and support both at the supervisory level and in the whole university
- To appoint someone (HR officer, student advisor) to organize, facilitate and monitor the process
- To allocate a budget to support the agreed line of action
- For the HR project: To revise recruitment protocols and revise all communication.

Financial Incentives for Students with Disabilities and Specific Educational Needs
Universidad Miguel Hernández (Spain)

Context

The UMH develops active policies to promote the inclusion of students at risk of exclusion (Figure 8), as stated in the 1st Strategic Plan for Equity, Diversity, and Inclusion. Within this framework, the university offers the Grants Program for Students with Disabilities and Specific Educational Needs. With an annual budget of 30.000€ (Figure 9), the program provides financial support that compensates for extra expenditures that disadvantaged students usually invest in concepts such as transport, human resources, or educative resources. Every application is studied individually, and those granted are surveilled to ensure transparent and responsible management of the funds. This kind of support is not common in the higher education system in Spain, and it is completely missing in the grant schemes of the other public universities of Valencian County.
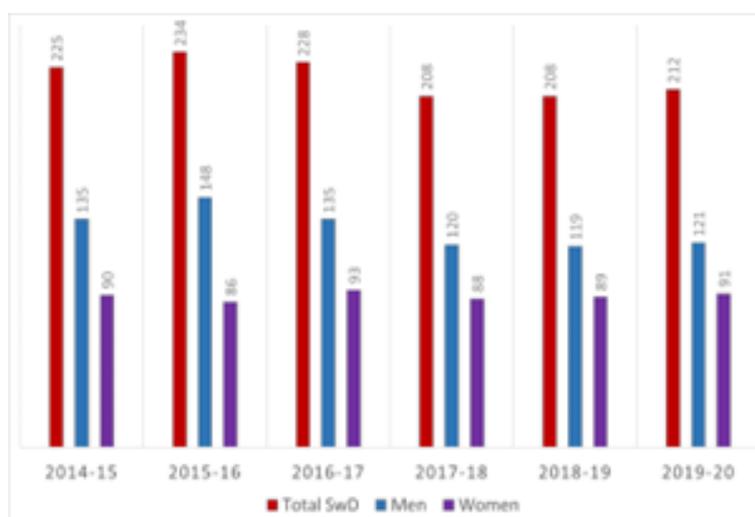
Figure 8. *Total number of students with disabilities (SwD) at the UMH in the last six academic years and their distribution by gender.*
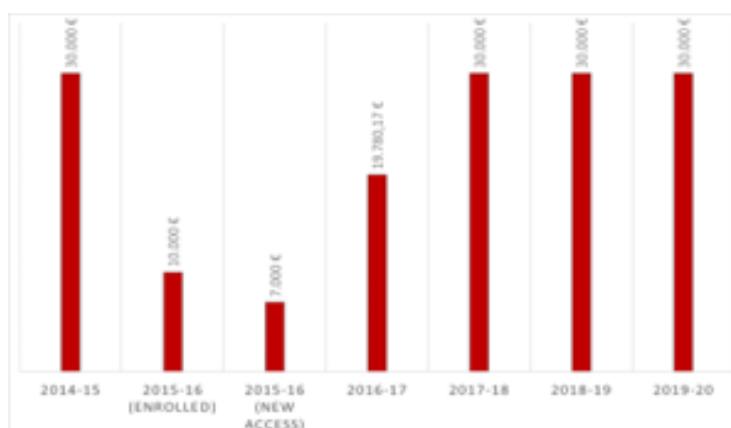
Figure 9. *Right - Budget (in €) invested since 2014-15 in the grant program.*

While the total number of scholarships directly depends on the total number of applications (shown in Table 2), their distribution relies on various criteria. Of particular interest are the cases of new entries to

the university system and those that require human resources (e.g., sign language, personal assistance). Scholarships are allotted as follows:

- Maximum 40% to fresh students.
- Minimum 20% to undergraduate students.
- Maximum 20% to master or Ph.D. students.
- 20% to special actions, such as sign language aid or personal assistance.

Students are eligible for funding if they meet the following requirements:

1. Candidates must be admitted to the UMH.
2. Candidates must not have working or administrative relationships with public or private organizations.
3. Except for new entries, candidates must have obtained a minimum percentage of credits that varies depending on the knowledge area:
a. 65% for Engineering and Architecture.
b. 80% for Health Sciences.
c. 90% for Arts and Humanities, and Social and Legal Sciences. Validated, adapted, or recognized credits do not count.
4. Candidates must declare a family income below the threshold established by the General Scholarship Call from the Ministry responsible for Education.
5. Candidates must possess a disability rating higher than 33%.
6. Candidates must not hold any other grant offered by the UMH.
7. If candidates held this grant previously, all reports must have been submitted.
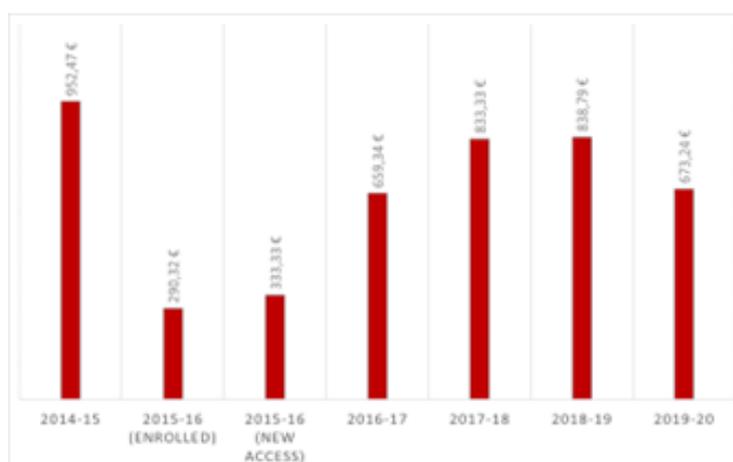
Figure 10. *Mean amount (in €) per grant over the last six academic years.*

The mean amount for each grant is depicted in Figure 10. However, the program offers personalized support that generates, within the same call, grants of variable amounts. The total amount for an individual grant is calculated using the criteria stated in Table 1. The formula comprises fix and variable components. While a fixed 40% of the budget is distributed among all the applications according to the documented disability rating of the students, the other 60% goes to a variable amount that is calculated depending on students' socioeconomic level, family background, and personal situation.

% Budget		Criterion	Operations	Remarks
40% (12000€)	A	% documented disability rating	(12.000€ / ΣN disability points) * Ni disability points	N = total number of applications Ni = individual disability points E.g.: 33% of disability = 33 points
60% (18000€)	B.1	Family income per capita	Range:**0.5 - 2 points**	Up to 1682.83€ /year: 2 points. Up to 3005.06€ /year: 1.5 points.

				Up to 4507.59€ /year: 1 point. Between 4507.59 and 6010.11€ /year: 0.75 points. More than 6010.12€ /year: 0.50 points.
	B.2	Special purposes	Students must justify their needs and explain the costs. **Max: 2 points**	Items: special transport, personal assistance, special learning resources, need of a collaborator student to assist her/him.
	B.3	Previous scholarships	**Max:1 point**	The committee will take into account if the candidate has been previously awarded or if it is a new entry.

Table1. Criteria to calculate personalized grant amounts.

Relevance

The program provides support to an increasing percentage of the population of disadvantaged students at the UMH, reaching almost 20% in the last call (*Table 2*). Importantly, applications reveal clear gender-balanced access (one of the objectives of the Plan for Equality, *Figure 11*), a proportional representation across the different degree levels (*Table 3*), and a wide spectrum of types of impairments (*Table 4*). These statistics are useful to shape a program that tackles issues usually overlooked by the support initiative from the higher education institutions. For instance, using these funds, the UMH engages non-disabled students as collaborators and also hires sign language interpreters that aid deaf students during lectures and practical lessons.

	2014-15	2015-16 (enrolled)	2015-16 (new access)	2016-17	2017-18	2018-19	2019-20
Total applications	20	33	19	40	34	29	41
Admissions	19	31	19	28	29	29	37
Exclusions	1	2	0	12	5	0	4
Supporting students	5	7	2	3	7	4	4
Total grants	24	38	21	31	36	33	41
% Total SwD at UMH	10.7	16.2	--	13.6	17.3	15.9	19.3

Table 2. Number of applications, admissions, exclusions, and supporting students since 2014-15

	2014-15	2015-16 (enrolled)	2015-16 (new access)	2016-17	2017-18	2018-19	2019-20
Bachelor	16	25	10	25	25	23	24
Master	3	5	9	2	4	6	12
PhD	0	1	0	1	0	0	1

Table 3. Distribution of grants throughout the different degree levels.

	2014-15	2015-16 (enrolled)	2015-16 (new access)	2016-17	2017-18	2018-19	2019-20
Physical	12	23	13	18	18	12	17
Hearing	1	1	1	3	4	6	6
Visual	2	0	1	1	1	1	3
Mental health	3	4	1	3	3	3	6
Physiological	1	2	3	2	3	6	3
Autism	0	1	0	1	0	1	2

Table 4. Distribution of grants according to types of impairment and level of the university studies.
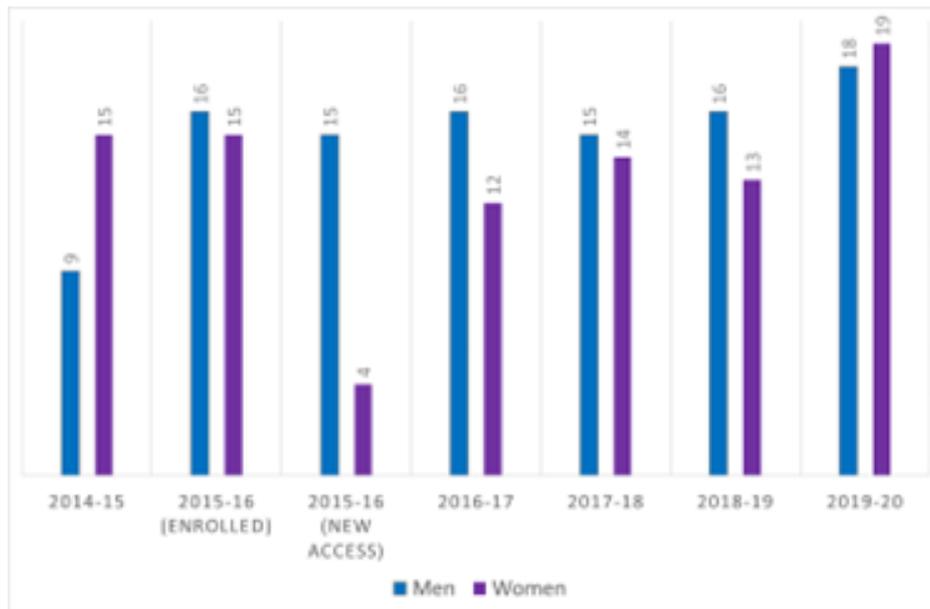
Figure 11. *Number of grants according to gender.*

Relevance and recommendations for NeurotechEU

- To establish protocols aimed at promoting the support and inclusion of disabled students.
- To ensure fair learning opportunities for the students with a disability or specific educational needs.
- To generate a memorandum that states the basic resources needed to grant an inclusive education.
- To create a repository of strategies and resources to be shared by the members of the consortium.
- To allocate a budget for those students that need special support or resources.

Equal opportunities in higher education
Karolinska Institutet (Sweden)

Context

Karolinska Institutet, KI, is one of the world's leading medical universities, with a vision to advance knowledge about life and strive towards better health for all and with a mission to conduct research, educate and collaborate with society at large. Karolinska Institutet offers an experience characterized by openness, creativity, and curiosity, focusing on student and employee development. By working with equal opportunities, gender equality, work and study environments, KI focuses on creating the right conditions for all involved in the educational, research, and support domains. Factors such as gender, transgender identities, gender expression, ethnicity, religion or other belief, disability, sexual orientation, age, and social background cannot stand in the way of completing education.

In its strategic plan, Strategy 2030, KI focuses on equal opportunities for all and a sound work environment focusing on good physical, organizational, and social study and work environment free from discrimination, offensive behavior, and harassment. Wide access and participation, equal opportunities, and fair and equal treatment are well established in the university. KI promotes continuous, high-quality competence development in broad-based recruitment, leadership, work environment, equality, diversity, and sustainable development. The main focus is to secure equal conditions and career paths for all employees, regardless of background, and ensure that the educational programs provide knowledge, skills, and attitudes regarding gender, power, and equality, fundamental to healthcare equity. Karolinska Institutet aims to be a workplace and an educational environment free from sexual harassment, bullying, victimization, and all types of discrimination.

Widening access

KI conducts structured work on widening access and participation concerning prospective students' recruitment and broadening participation. Several outreach activities are aiming at connecting with new student groups. For example, KI offers the opportunity to "shadow a student" for half a day if you are interested in knowing more about studies at KI and life as a student at the university. However, during 2020 this "shadow a student" activity has been offered digitally through video and email conversations due to the pandemic. Current students of KI are engaged in outreach activities by sharing their experiences with prospective students on student blogs and social media platforms such as Instagram, Facebook, and YouTube. The digital ambassadors write about life in Sweden, along with insight on the educational experience in Sweden and at KI, in blogs, pods, and vlogs. Strategies to reach out to, e.g., first-generation students, students from different social backgrounds, and students with disabilities have been included in the new action plan for widening access. Researchers from KI also discuss their research when visiting schools and at events directed to upper secondary school students.

KI is an active member of the network Include, a national network for broadened recruitment that includes more than thirty Swedish higher education institutions. The network encompasses arranged conferences, network meetings and contributes to national policy within this field.

Academic Writing Support at the Karolinska Institutet University Library (KIB) aids students to improve their academic writing, reading, and oral presentation skills in Swedish and English. It offers appointments and workshops at the undergraduate or graduate level, either as stand-alone workshops or a series of workshops integrated into a course or program. Academic Writing Support also offers workshops intended to support KI faculty in student writing teaching and tutoring.

Equal opportunities at KI

Karolinska Institutet's focus on equal opportunities means that no one should be discriminated against or harassed because of gender, transgender identity or expression, ethnicity, religion or other belief, disability, sexual orientation, or age. Furthermore, KI works to create inclusive work and study environments where everyone is treated with respect and where the conditions encourage the development of human potential. Following this initiative, KI offers resources, including guidelines and online courses, on unconscious bias, discrimination and equal opportunities, harassment, and employee victimization. Moreover, KI supports the LGBTQIA community by honoring the International Day Against Homophobia, Transphobia and Biphobia with a seminar on LGBTQIA and health and by participating in the annual Stockholm Pride Parade in Stockholm. KI also focuses on mitigating sexual harassment within academia through research and cooperation programs and encouraging good reporting practices within the institution. Furthermore, KI has put forward guidelines concerning discrimination, harassment, and victimization.

Widening access and participation?

In 2019/2020, about 42% and 39% of first-year university students in Sweden have parents who have completed at least three years of higher education. Therefore, if the university's recruitment were to correspond to the population's distribution, just over 25% of the beginners would have parents who completed higher education, and almost every third would have parents who did not. The Swedish Higher Education Authority (UKÄ) writes that "the difference between the university distribution and that in the population can be seen as a rough estimate of the social bias in recruitment to the university" (Statistics Sweden/Swedish Higher Education Authority Statistiska meddelanden, UF 20 SM 2002).

KI focuses on widening access to prospective students. Some examples of actions for reaching new student groups include the "Shadow a student" initiative, collaborations with different schools, and visits of KI's student ambassadors at schools. As part of the broad participation initiative, KI holds language workshops in Swedish and English. KI is one of the universities that took the initiative to form a national network for widening access that arranges conferences and network meetings and contributes to national policy.

Gender mainstreaming

Karolinska Institutet's work with gender mainstreaming follows the directive of the Swedish Government. The use of gender mainstreaming to reach the Swedish gender equality policy goals dates back to 1994. According to the strategy – and the newly adopted action plan for gender mainstreaming at Karolinska Institutet 2021-2022– gender equality work must be integrated into the regular operations and not be dealt with separately. Therefore, for achieving the national gender equality goals, the organization is systematically highlighting and analyzing the impacts of various proposals and decisions, targeting areas such as:

- Leadership and leadership development
- Career development, recruitment, and retention
- Equal opportunities for all and a sound work and study environment
- Assessment and allocation of funds and resource
- Gender perspective in educational development and pedagogy

Relevance and recommendations for NeurotechEU

Karolinska Institutet actively supports integrating a more extensive array of student populations, ensuring their success in and beyond higher education. Furthermore, by emulating KI best practices such as gender mainstreaming strategies, integrating gender equality work, and fair admission practices, the NeurotechEU Alliance has the opportunity to deliver the promise of inclusion, non-discrimination, equity, and diversity in all educational programs and related activities across individual partner universities, associate partners, and the consortium as a whole.

Program „MitSprache – Integration via language coaching for new immigrants"
Rheinische Friedrich Wilhelms Universität Bonn (Germany)

Context

MitSprache is a program of the University of Bonn, carried out by the Department for Intercultural Communication and Multilingualism in cooperation with the Caritas Association Bonn. The beginning of the cross-institute initiative, embedded in the curriculum, goes back to Autumn 2015, when the first module, Engaged for Refugees, was designed.

The concept sees language as the key to integrating new immigrants, enabling educational opportunities and societal "co-speak" (Mit-Sprache), i.e., participation. The program's focus is on the integration and inclusion of young people of international origin who have recently moved to Germany and are interested in studying or vocational training. MitSprache aims to qualify students of the Faculty of Philosophy as language coaches who support and accompany newcomers on their way to university. In the seminar, students acquire knowledge of language didactics, as well as methodological and socio-cultural skills. After the seminar, they conduct community service to support and accompany immigrants during their integration in Germany.

To ensure exchange between students and new immigrants, the latter is directly involved in the seminar and participates in several module sections. The newcomers learn with and from already successful fellow students to effectively initiate and master situations - not only in terms of language. Therefore, a three-part module based on language interaction and cooperation between students and new immigrants interested in studying was designed and carried out in this fully developed setting since February 2018.

Importance of the program

Institutional anchoring of diversity is a task for the entire University community. The overarching goal is to provide systematic support to all persons to reach their full potential, promote educational justice and excellence, initiate changes to structural frameworks, and achieve equal opportunity.
The University of Bonn acknowledges its obligation to engage in sufficient measures to promote diversity within the University of Bonn community and implement suitable structures and adequate framework conditions. The ultimate goal is to dismantle barriers and prejudices and to identify, nurture and strengthen untapped potential.

MitSpracheis one of the established and evaluated offers which show how the University of Bonn, as a learning organization, provides access for those (potential) students for whom studies generally present barriers.

Widening access is accompanied by an appropriate and systematic concept and by modules that assist the newcomers to orientate better, integrate and achieve their professional goals. On the other hand, the language coaches develop awareness for diversity issues. Overall, culturally sensitive social interactions are promoted, which leads to broadened horizons.

Furthermore, MitSprache is a best practice example for the opening of the university towards society in order to support inclusion and equal opportunity in cooperation with regional stakeholders. Besides the official partner, the Caritas Association Bonn, several players – such as the Association AsA or the Municipal Integration Centre Rhein-Sieg, or the student university group Start Study - support the program by being directly involved in the modules.

The Innovation Campus Bonn (ICB) of the University of Bonn is engaged to establish Service Learning, a form of teaching and learning that combines academic learning with community service. The learning component (the theoretical knowledge for a topic is academically prepared and taught in seminars) and the service component (students apply what they have learned from the theoretical seminars in practical projects at community partners) are essential parts of the curriculum and are well balanced. MitSprache is one of the first successful Service Learning offerings of the University of Bonn.

From 2021, the university's Equal Opportunity and Diversity unit will provide financial and advisory support for the program MitSprache and the program will be extended to all university faculties in the course of this enhancement. The University of Bonn is thus promoting widening access and inclusion. Furthermore, acknowledging students' engagement responds to a real need for a diverse society and the wish of many students to become involved with newcomers according to their abilities.

Scalability & Challenges

MitSprache is an evaluated and established modular program which is part of the curriculum. These are good conditions if a similar project is planned at a different location. Since MitSprache has a service component, cooperation with regional society actors is essential.

MitSprache was involved in the network Stark durchDiversität (Strong through Diversity), which emerged from the working group Handlungsfähigkeitim System Schule (Ability to act in the School System). Based on its professional handling of migration, multilingualism, and heterogeneity of young immigrants, MitSprache was selected as a best practice example of promoting intercultural competencies in teacher training within the framework of a Stifterverband publication.

Relevance and recommendations for NeurotechEU

- Qualify students as language coaches who support and accompany newcomers on their way to university.
- Involve new immigrants in seminars and modules on how to effectively initiate and master situations - not only in terms of language.
- Establish Service Learning, combining academic learning with community service.

Mechanisms for widening access in Turkey
Boğaziçi Üniversitesi (Turkey)

Context

Boğaziçi University aims to create a university community within the university campuses, easily accessible for everyone, including individuals with disabilities, which encourages maximum participation. The university makes necessary arrangements to quickly enable students with disabilities to access all programs and activities available on the campuses. It is conducting studies to strengthen their active participation in all events that will support their social development. There is a Unit for Students with Disabilities, and Assistive Technology and Education Laboratory for Individuals with Visual Disabilities (GETEM), directly attached to the Rector's Office.

Unit for Students with Disabilities

Students with Disabilities Unit is the service unit that aims to enable all undergraduate and graduate students enrolled at Boğaziçi University to benefit fully, freely, and equally from all academic, social, and physical opportunities and services. It aims to easily access all such events and activities. The committee determines students' needs, examines the obstacles they might face during their studies, offers suggestions to eliminate the challenges, and makes the necessary adjustments.

- Below are the duties of the Unit:
- To cooperate with faculty members, departments, and faculties for necessary adjustments to the students' course and exam programs.
- To determine the needs of students regarding dormitories, scholarships, and health services and develop ways to resolve them.
- To prepare individual 'adaptation letters' about students' academic needs (collecting information about arrangements in the educational environment and methods in line with students' needs and their particular disability) in coordination with the student and the faculty member teaching the course.
- To research and determine the equipment needed and procurement of necessary materials.

The studies carried out by Boğaziçi University and the Disability Unit in 2019 were again deemed worthy of an award called Barrier-Free University Flags, offered by the Higher Education Institution of Turkey started to be given in 2018. The Faculty of Engineering received three awards which are the highest out of three levels: "Flag for Access in Space (Orange Flag)", "Flag for Accessibility in Education (Green Flag)", and "Flag for Accessibility in Socio-Cultural Activities (Blue Flag)".

Assistive Technology and Education Laboratory for Individuals with Visual Impairments (GETEM)

GETEM as an Internet Library

GETEM has provided free assistive technology services for our university students with disabilities and free online digital library services for individuals with visual disabilities in Turkey since 2006. The digital library project aims to reach nearly 500,000 individuals with visual disabilities and other disabilities, including individuals with cerebral palsy and individuals with reading disabilities in Turkey. In addition, the municipalities, NGOs, and universities in Turkey use digital library services.

The Internet library project designed by GETEM is aimed at visually impaired students access to information resources. The publications in the library are mainly in Turkish and English. It includes textbooks (books, articles, lecture notes) and records of some courses and conferences, scientific

papers and books, and texts such as stories, novels, and poetry. In addition to these, many different contents such as radio theatres, mp3 versions of films with Audio Description, Audio computer, and smart device narrations have taken place in the GETEM catalogue.

GETEM digital library includes Turkish and English materials, stories, novels, poems, and teaching materials, including books, articles, class notes, lessons, and digital conference records. Those materials (totalling 7,500 audiobooks) are either in human voice or in a computer voice. Those materials can be listened to by special programs or read by refreshable Braille displays that turn the electronic text on the computer screen into Braille simultaneously.

For the purpose mentioned above, the internet library offers users electronic text, human voice, and computer voice formats. The works within GETEM are produced by volunteer readers and cooperate with other libraries serving the visually impaired. People who cannot control the computer and the internet can benefit from some of the works via telephone. GETEM has significantly succeeded in socializing the book reading process and share and create public opinion with thousands of volunteer readers' efforts. Volunteers who want to vocalize books for the library can come to the recording booths or sing in their environment after sending a 5-minute trial recording.

GETEM as Technology and Education Laboratory

In addition to its internet library service, GETEM provides consultancy to all individuals and organizations that develop applications, design accessible products, make their websites accessible, and support new opportunities and outcomes.

GETEM, notably Boğaziçi University, is a complete education and experience centre for visually impaired students with its computer laboratory and various assistive technologies. For example, Boğaziçi University students who come to GETEM can convert their textbooks into a computer environment via Scanner, take Braille printouts. In addition, they benefit from the computer lab with screen readers, Braille display, and screen magnification systems and obtain tactile embossed versions of visual graphics in their hands.

Apart from these, GETEM acts as the Boğaziçi University students with disabilities office secretariat. It continues its activities to ensure that students with disabilities can benefit from all academic, social, and cultural facilities equally. These activities include finding assistant students to work with, converting textbooks into accessible formats, advising academics to provide students with a more accessible course environment, providing training to students who wish to use assistive technologies more efficiently, and more.

As a result, in line with the mission of GETEM, all printed resources in particular and all visual products and materials to be accessible to the visually impaired. With the infrastructure and support of Boğaziçi University, our academicians and university staff's encouragement, our team's efforts, and our volunteers' sincere walk, a more barrier-free and more accessible world are possible. GETEM is an accessibility centre that keeps its belief and hope alive.

One of the important achievements in 2019 regarding service to the community was to help visually impaired people in Turkey vote alone and on a secret ballot. We can consider these studies as the adaptation of the system we have been implementing in Student Representative elections for years to the Presidential and Parliamentary elections held on the 24th of June 2018. After the application of the non-profit Barrier-Free Access Association to the Supreme Election Authority, which resulted in the permission of the visually impaired to vote with the help of the ballot template, Boğaziçi University and the Accessible Access Association made a collaboration. Visually impaired People who wanted a template were determined, the desired number of templates was printed, and then they were sent to nearly 3,000 visually impaired people located in different parts of Turkey. At the end of the study, it was

understood that visually impaired people could use the templates without any problems. A similar process was followed for the Istanbul Metropolitan Municipality election, repeated on the 23rd of June 2019. More definite cooperation was made with the Istanbul Provincial Election Board, and a full-size template was produced by seeing the compass in place. With this template, unimpeded and intimate voting was successfully achieved.

As a result of these successful studies in the elections, which enabled people who are blind to cast their vote without assistance, thus ensuring their confidentiality, GETEM and Barrier-Free Access Association received an award from the Zero Project headquartered in Austria. The details can be seen on https://zeroproject.org/practice/pra191354tur-factsheet/. The mission of the Zero Project is to work for a world with zero barriers. Worldwide, the Zero Project finds and shares models that improve the daily lives and legal rights of all persons with disabilities.

Relevance and recommendations for NeurotechEU
- Assessment of students' needs and obstacles
- Free assistive technology services for our university students with disabilities and free online digital library services for individuals with visual disabilities
- Consultancy to individuals and organizations developing applications, accessible products, or making their websites accessible
- Education and experience centre for visually impaired students with a computer laboratory and assistive technologies.
- The Internet library project designed for impaired students

The Equality and Diversity Unit at OXF
University of Oxford (United Kingdom)

Context

The University of Oxford (OU) has over 15,000 staff and more than 24,000 students and is committed to fostering an inclusive culture that promotes equality, values diversity, and maintains a working, learning, and social environment in which the rights and dignity of all its staff and students are respected.

The University offers various resources for students and staff that promote equality and diversity, including online courses, workshops, training, and mentoring on a variety of topics (race bias, race awareness, LGBT+, bullying, and harassment in the workplace, the impact of micro-behaviours in the workplace, creating an inclusive culture).

In this section, we describe mechanisms already in place at OU to ensure the aforementioned goals to identify valid start-up interventions for widening access and participation for all in the NeurotechEU initiative.

Diversity

The University of Oxford aims to attract people of high potential to study and work here, regardless of background. The University's commitment to fostering an inclusive culture means recognizing people's diversity and their needs.

For students and staff living with a disability, the University supports tailored 'reasonable adjustments, as required by UK law. In addition, the specialist student Disability Service and Staff Disability Advisor support individuals and their departments to put in place the support they require, offer general advice on good practice, and promote awareness of disability issues.

The University also supports the LGBT+ community by working on initiatives for developing a more inclusive workplace and culture. The University is proud to be a member of the Stonewall Diversity Champions Programme and participates in the Stonewall Workplace Equality Index to assess the institution's progress on LGBT+ equality and planning future actions. In addition, the University has an active LGBT+ Staff Network, providing social and work-related networking opportunities and growing LGBT+ Role Models and Allies networks.

Oxford University is unequivocal in its opposition to racism and discrimination, committing to addressing systemic racism within the community and race and ethnicity practices and beliefs. The University carries out an array of activities aimed at tackling racism, many of which are outlined in its comprehensive action plan, developed for its application to the Race Equality Charter in 2018. Through its Race EqualityTask Force, the University is developing a strategy to address racial inequality within the institution, ensure anti-racist action at all levels and accelerate progress toward racial equality. The Task Force will be active throughout the 2020/2021 academic year, with several streams of activity reflecting staff and students' needs. Among these, there will be a program of engagement with all stakeholders through workshops and forum events, a strategic mapping of gaps and weaknesses, the development of a framework for future activities and a comprehensive report and strategy, and a business plan for change that will be presented to the Council in September 2021. These outputs will

feed into the University's next Race Equality Charter submission, which is due in 2022. The University's participation in the Race Equality Charter provides a framework for analysis and results in a comprehensive action plan to promote race equality. In addition, the University has an active BME staff network that organizes social and career development activities.

Gender equality is another significant concern at the University of Oxford. The year 2020 marks the centenary of women being admitted as full members of the University, and there is a dedicated website to mark the occasion. To support the development of a comprehensive action plan for gender equality, the University participates in the Athena SWAN Charter, focusing on increasing the proportion of women in senior academic roles and achieving strong representation in decision-making at all levels. Athena SWAN also offers a valuable framework for introducing cultural changes that create a better working environment for both men and women.

Diversity Fund and Returning Carers Fund

The Diversity Fund is a £70,000 annual fund that provides small grants to initiatives to further this commitment and deliver a lasting change in the University's culture. The fund targets applications that show innovative and sustainable strategies for contributing to the institution's equality and diversity priorities while demonstrating the breadth of impact, a clear strategy for widening the implementations of good practices, or clearing plans for external influences.

The Returning Carers Fund is a flexible fund to support those who have taken a break from caring responsibilities to re-establish their research careers. It offers grants up to £5k, or in exceptional circumstances, up to an absolute maximum of £10k, which can be used in whatever way (attending conferences and training sessions, funding research collaborators' travel to Oxford, employing short-term research or administrative assistance and funding teaching buy-outs) to support the applicants' return to research and the development of their career. The scheme is open to all academic and research staff employed by the University who have either taken a single break of at least six months for caring responsibilities in the two years before the closing date for applications or taken two or more breaks of at least six months each in the five years before the closing date for applications.

University policies

The University has agreed to a suite of objectives reflecting Oxford's strategic priorities in relation to recruitment, progression, and equality of opportunity, as set out in the Strategic Plan, aiming to:
- Increase the proportion of women in senior roles;
- Improve the recruitment and retention of BME (Black and Minority Ethnic) staff;
- Promote the visibility and inclusion of LGBT+ staff and students; and
- Widen undergraduate access and admissions.

In its Annual Equality Report, the University sets out key equality data and summarises the main equality-related activity during the preceding academic year. The Report contributes to the University's evidence-based policymaking and highlights the key areas for improvement, informing the setting of targets and indicators for the existing equality objectives, pinpoints additional objectives to be identified.

Relevance and recommendations for NeurotechEU

As one of the world's leading higher education institutions, the University of Oxford provides an abundance of best practices one could envision for the present and future of NeurotechEU.
Nevertheless, given stark differences between partner countries in funding and structure of the educational systems, the importance of mutual benefit from the initiative, and, more recently, the withdrawal of the United Kingdom (UK) from the European Union (EU), concerns related to feasibility and prioritization of widening access strategies emerge in the piloting phase of our European Universities initiative.

Heterogeneity of approaches for widening participation for students and staff across NeurotechEU partner universities and countries adds an important layer of complexity to the already nontrivial task of securing equality and diversity by design in the project.

Alliance leaders must therefore identify pragmatic solutions to extract appropriate working interventions from individual universities, match these to corresponding gaps in the dynamic and expansive consortium environment and deliver culturally versatile iterations as early as possible in the entire process. Innovative pathways to transfer best practices and disrupt barriers and discrimination must emerge as NeurotechEU looks forward to serving as a pacemaker for academic and societal development in the following decades.

Strategies to promote internationalization within NeurotechEU

Iuliu Hațieganu University of Medicine and Pharmacy (Romania)

Context

There has been a steady increase in the interest of international students in choosing to pursue their higher education in Romania. Iuliu Hațieganu University of Medicine and Pharmacy (UMFIH) prides itself on the number of international students enrolled within the English and French study programs every year. As a result, the number of available places for international students has doubled over the years, both for the English and French lines, considering the infrastructure and human resources needed in the faculty.

There are 1816 students in foreign language programs, accounting for 45 53% of the students from the faculty of Medicine. The financial contribution for the University by the schooling of international students is approximately ten million Euros per year. Under these conditions, the Faculty of Medicine from UMF Cluj is the faculty with the highest number of international students in Romania. This is positively appreciated at the national level by various ministers of education, local authorities, and the president.

International approach

The admission of international students at the Faculty of Medicine is carried out following an analysis of the folder after a specific methodology and specific and quantifiable criteria elaborated by the Council Bureau of the Faculty, announced beforehand to the candidates, and published on the university website. The selection of files is out with maximum rigor during July. The competition for 2019 was high: in the English line of study, there were approximately 2,6 candidates per place; respectively, 2,3 candidates/place for the French line of study. UMFIH has actively sought to expand the target group through certification and accreditation efforts to achieve this result.

Affiliations to promote internationalization

- Agence universitaire de la Francophonie (AUF) and its institutional networks:
- Conférence Internationale des Doyens des Facultés de Médecine, Pharmacie, et Chirurgie Gentaired' Expression Française (CIDMEF, CIDPHARMEF, CID-CDF)
- Société Internationale Francophone pour Education Médicale (SIFEM)
- Organization for PhD Education in Biomedicine and Health Sciences in the European System (ORPHEUS)
- L'Agence Universitaire de la Francophonie (AUF)
- European University Association (EUA)
- European Association of Faculties of Pharmacy (EAFP)
- Heads of University Management & Administration Network in Europe (HUMANE)
- Organisation for PhD Education in Biomedicine and Health Sciences in the European System (ORPHEUS)
- The Worldwide Innovative Networking Consortium (WIN)

InfoUtil UMF Cluj Mobile Application

For the duration of the 2015-2019 mandate, the efforts of the FM management in the scope of Romanian and foreign student integration in academic life were a constant preoccupation. Plenty of actions and activities have been carried out with the mentioned aim. One of the actions regarded the development of the mobile application "Info Util UMF Cluj" for mobile phones/tablets dedicated to students. In this

way, the students can benefit from helpful information related to their stay in Cluj and the advertisements that the faculty is implementing in real-time. This app is the first of this kind in the country, and it is of great use, especially for 1st-year students.

The app contains information related to the everyday life of the medical student. With an intuitive design, the app offers information on the didactical matters, exams, campus, schedule, but also relevant information on Cluj-Napoca (transportation, monetary exchange, medical insurance, cultural life, and student organizations). The "Campus" section allows students to identify the central locations of the faculty, including addresses, pictures, and map locations. In contrast, the "Schedule" section allows students to visualize the program of the courses and the place where they are carried, with the picture of the building, GPS location, and the time to get to the destination. The app can be downloaded from GooglePlay and Apple Store.

International student guide

Another element to the aid of beginning students is "the International Student Guide", available in French and English. It encompasses valuable information on admission, regulations, courses, exams, credits, facilities, mobilities, scholarships, and student organizations. It also provides insight into life in Cluj, including arrival, accommodation, weather, daily life, and costs. The guide is handy for international students in their 1st year of study, who can find support for more comfortable accommodation to live in a foreign country, with practical, organized, and precise information. The development of the guide was financed through a project named FDI2016, Domain2: Internationalization of higher education in Romania, MEDSTUD – Medical students in Cluj-Napoca, guided by the faculty dean. The guide is offered for free to all students, usually during the integration workshops for international students, organized before the beginning of the academic year. In 2016 the guide was distributed for the first time during the International Student Week (28-30 September 2016) to 636 people, of which 433 students, 161 parents, 32 didactical personnel. The guides were also offered to students during 2017-2019.

Both the mobile app and the "International student guide" were made possible by the project won by the faculty in 2016, MEDSTUD-Medical studies in Cluj-Napoca, in the context of the competitions launched and financed by the National Council for Financing Higher Education, on the domain of Internationalization of Higher Education in Romania. The financing was 174.000RON. The project aimed to achieve an increase in the level of internationalization in the university by increasing the attractiveness of the study programs and supporting the integration of international students into the university life of Cluj. Another project's output was represented by a contest of clinical cases (the winners, five international students, received a two-month research scholarship). Furthermore, a section on the university website was developed dedicated to foreign student admission, translated into five international languages. The most relevant result of the project has been the mobile app.

Prérentrée –Welcoming days

The University of Medicine and Pharmacy "Iuliu Hatieganu" from Cluj-Napoca in partnership with student organizations EMSA (English Medical Student Association) and CMC (CorpoMédicaleCluj), along with the French Embassy in Romania and the French Institute of Cluj-Napoca, has organized, for the past four years, successive editions of the "Seminar for the integration of international students from the English and French study lines". The activities took place in parallel under the names Pre-rentrée, respectively Welcoming Days, and they addressed students from the 1st year from the foreign language departments of Medicine, Dental Medicine, and Pharmacy faculties. The seminar aimed to help the newcomers from over 45 countries to discover a friendly, multicultural, and modern Cluj and feel at home for the duration of their university studies.

Annually, a Romanian cultural evening takes place, including folkloric shows and shows by the medical student orchestra, culminating in an intercultural dinner on the 28th of September. In addition, the students receive the "Guide of the international student", which encompasses the necessary information

for accommodation to academic life and are made familiar with the "InfoUtil UMF Cluj" mobile application, aimed at providing essential information for the day-to-day life of students in Cluj-Napoca.

Relevance and recommendations for NeurotechEU

This initiative provides support for the integration of international students, encouragement of international study, and the development of tools for students and staff alike. This is an important step in the development of the NeurotechEU and a valuable opportunity for all universities engaged in the consortium. The funds could be used for developing technology that would aid the integration of students and creating tools and opportunities, especially for 1st-year students.

The triangle of Education, Cooperation and Innovation
Debreceni Egyetem (Hungary)

Context

NeurotechEU is an Alliance where besides the mutual collaboration of the involved Universities, the strong connection and interaction of the Universities with the business sector representatives, local government, and other institutions have outstanding importance.

The University of Debrecen (UD) is more than four hundred and fifty years old, it is Hungary's oldest higher education institution operated continuously in the same city, and as one of the largest educational centres in the country, it is a central player in Hungarian higher education. It has outstanding educational, research, cooperation, and innovation capacities in international comparison as well. Moreover, as a leading university, it is known in Hungary as an intellectual centre providing the broadest spectrum of educational programs while also closely cooperating with the private sector, the business sphere, and the local government.

Besides the performance of its essential functions and duties at the highest standard and quality, the UD is dedicated to playing an active role in the development of the economy in the Northern Great Plain Region of Hungary and acting as a service provider for innovation by companies of the region, primarily in the health industry, biotechnology, agriculture, and technology.

University of Debrecen approach
Education

As one of the country's most popular institutions of higher education outside the capital, more than 1,700 faculty members perform educational, research, and development activities in 8 campuses, 14 faculties, and 24 doctoral schools to provide students with a competitive diploma when they enter the world of work as new professionals. The university offers bachelor's, master's, and one-tier (combined bachelor's and master's) programs whereby elements of knowledge are built on one another, guaranteeing continuous development in the given discipline. Doctoral schools, colleges for advanced studies, scholarly student circles, and talent-management programs support academic performance and fulfilment. In the dual training programs, students acquire practical skills and competencies in cooperation with business partners.

UD offers the widest range of educational programs in Hungary: Students may choose from close to 30,000 courses offered, with an average of 519,600-course registrations every semester. Among the institutions of higher education in Hungary, the University of Debrecen has one of the largest student populations, with 30,194 people studying at the university.

Collaborations

The university aims to play a central role in the economic and social development of the region in the field of innovation. This requires close cooperation and collaboration between the university, businesses, and the Municipality of Debrecen.

The University of Debrecen has established strategic partnerships with numerous companies for innovation and collaboration in various projects. These include, among others, the "Rusatom – International Network" for the development of the international, regional network for the nuclear energy industrial complex, GE Hungary, Richter Gedeon, TEVA, BMW, Tungsram, Krones, ThyssenKrupp, Continental, IT-Services Hungary, National Instruments Hungary, GANZ Engineering. In the strategic agreements concluded with the companies, objectives include collaboration in teaching and research

tailored to the needs of the businesses and making the practical training of students more effective. Thus, the faculties of the UD work together with numerous companies and businesses involved in research, innovation, production, and sales to improve students' practical training.

The University of Debrecen is a pioneer in the Hungarian cluster organization and one of those universities among higher education institutions that plays the most prominent role in establishing and operating clusters. The institution's objective is to make technology transfer more effective which, in turn, can contribute to economic development in the region.

In the last ten years, five clusters were organized around the University of Debrecen, all of which are accredited clusters, two with international accreditation. The clusters operate in the pharmaceutical industry, thermal know-how and tourism, food industry, sports, informatics, and instrument development (Pharmapolis Innovative Pharmaceutical Cluster; Hungarian Sports and Lifestyle Development Cluster; Northern Great Plain Regional Thermal Cluster; Pharmapolis Innovative Food Industry Cluster; Silicon Field Cluster).

It is an exceptionally progressive feature of the clusters around the University of Debrecen that they created a network of national significance from key sectors. In this respect, they are unique among Hungarian clusters as they integrate the industry development efforts of financially medium-sized solid and large enterprises, innovative university "spin-off' and "start-up" companies, chambers, local governments, and universities.

University Industrial Park – base for Innovation

Building on the university's knowledge base, new centres were established by Hungarian and international companies in Debrecen, using university infrastructure on the one hand and the industrial park of the city on the other.

The Industrial Park of the University of Debrecen is currently the only university industrial park in the country where besides research and development, consultancy, and service activities, the practical side of teaching can also be presented; moreover, it provides an opportunity for the establishment of an innovation platform of international significance.

The UD is devoted to developing active links and partnerships between higher education and the business sector; thus, it strives to implement such solutions in the Industrial Park of the University of Debrecen that could provide a model and a solution for the challenges of innovation and management as well as local economic development.

The objective of the University of Debrecen is to implement such development projects in the Industrial Park, which could support its innovation efforts and technology transfer, traditional business incubation, and the personal incubation of students (providing a solution for the practical employment of practice-intensive higher education programs).

Innovation Centre of the UD

As an active participant in the innovation chain/cooperation/knowledge triangle, the University of Debrecen is devoted to creating original, novel results in basic research that stimulate research and development and thus may create new opportunities for cooperation.

With the foundation of the Innovation Centre, the goal of the UD is to establish a bridge and system between the teaching and research site and the business sphere, which could help the collaborations flourish, the testing of RDI ideas, the investigation of the practical applicability of new research findings, and the introduction of young scholars into the practical aspects of their work.

The innovation centre established at the University of Debrecen based on the methodology of MIT, the leading technology university in the world, will be a crucial facility for all of Europe.

The University of Debrecen operates the most extensive healthcare system in Hungary, which provides an ideal background for clinical trials of research and development results in a real-life environment. The innovation program will begin with the health industry, but later on, its research will be extended to climate and energy, autonomous vehicles, and laser physics. Launching the MIT Catalyst was enabled by the EIT Health European Health Industry Innovation Network.

The goal of the Innovation Centre is to facilitate the University of Debrecen research and development along with innovation activities, support businesses building on university knowledge, and assist in implementing the region's economic development plans. The innovation plaza is a vertically organized, university-entered innovation system unique in Hungary.

Innovation and technology transfer

The technology transfer office of the University of Debrecen is the Centre for Technology Transfer and Research Commercialization (TTO). The primary role of the Centre is to support the university researchers in commercializing their research results. Therefore, it is advised that the researchers keep in contact with the TTO during the research projects to get relevant information about the business potential behind their research results.

TTO staff can provide support in IP protection, commercialization, collaboration with industrial partners, the establishment of spin-off companies, university IP regulations, and other innovation-related questions. The TTO provides wide-range innovation services for the researchers, students, and partners of the university. In addition, the TTO provides business services via virtual incubation to the spin-off companies of the university. The missions of the TTO are to commercialize the research results created at the university and provide assistance to the researchers in managing their collaborations with third parties.

Relevance and recommendations for NeurotechEU

The University of Debrecen's mission is to contribute to the interdisciplinary education of future generations in cooperation with Hungarian and international partners, with high-quality, interdisciplinary programs, innovation, and research built on versatile and practical experience.
Collaboration between the private sector, the business sphere, the local and state government in regional and cross-border educational, research and development programs allow the UD to act as a research university and play a pivotal role in economic development.

The practice of the University of Debrecen, based on the strong connection of education, cooperation, and innovation, can provide the NeurotechEU Alliance with the experience of the successful existence and development of such vital sectors within one symbiosis.

Key recommendations

Target Groups for Widening Access

The leading target group in widening access is represented by students belonging to the aforementioned vulnerable populations, along with the students and prospective students from the universities embarked on the program. Whether we are referring to students from lower socioeconomic backgrounds, from areas of low HE participation, ethnic students, mature or part-time learners, carers, refugees, students with mental health issues, physical or learning disabilities, or 1st generation students, widening participation aids the vulnerable students to find their path in the academic life and pursue personal and professional development. For some of these groups, the pursuit of traditional Higher Education might prove to be difficult at best. Through actions of widening access, we are ensuring fair chances for all prospective students.

Evidence-Based Interventions

ADMISSIONS

Opportunity access policies carried out through recognition of vocational, professional qualifications, or life experience ensure that students without formal eligibility have the opportunity to access Higher Education. These programs, supported by preparatory courses, would represent a tactic for bridging the gap in access to academia. The preparatory courses could be explicitly directed at disadvantaged students to bridge the gap in support. With the successful implementation in the context of Europe, it would come as a primary approach to bridging access. Along with this, opportunity programs offer increased access for disadvantaged students. Furthermore, employing stability measures for students impacted by COVID-19 and other crises would ensure a more fair admission and prevent volatility in the process, protecting the students. Targeted support is needed for certain students. Bridging loans and other forms of financial support along with offering personalized information for applicants regarding academic life would ease the transition process towards academia. Ensuring fair and transparent admissions is a general concern. Contextualized admissions, in the context of opportunity access policies, are another suggestion, highlighting the need for digital recruitment, counselling and communication, the tracking and optimization of conversion rates in prospective students, and improving communication strategies by keeping communication with students at all stages of the recruitment pipeline for creating a sense of community. Enhancing online presence, especially in social media, and communicating with students through social media would help better fill lacks in communication. Subsequently, considering cultural differences in designing and wording and tailoring the message in the context of the global crisis, underlining opportunities and considering prospective students' needs, as well as providing campus tours and employing tools such as student diaries, would create a wholesome approach to widening access.

LEARNING AND TEACHING

The process of learning and teaching is a focal point of this paper. The main concern is ensuring a fair and enjoyable learning experience, tailored and adapted to the various needs of the students, which not only builds knowledge and abilities into the targeted domain by providing a multidimensional approach but also prepares the student for the future job market and develops fundamental life-skills while focusing on developing their full human potential. The learning and teaching approach should focus on flexibility, having a personalized approach, and involving the student as much as the teacher. Various tools could be employed towards making the learning process more adapted for future generations. For example, innovation competition could be used to develop valuable skills such as time and team management, teamwork, problem-solving and creative thinking while also bridging the connection with the job market. Similarly, innovation boot camps could represent another way of learning and developing creative and structured thinking that would be of great use in personal and professional development. Employing nudging or behavioral approaches could improve the educational process while having a low-cost and high-reward prospect. These concepts could be used starting with the early steps in various

aspects of academic life, such as enrollment, student retention, communication. Various strategies, from game-based learning to the recognition of Massive Online Courses and even gamification as a part of upgrading the educational process, all have outstanding abilities to build a multisectoral, trans-disciplinary teaching and learning environment and developing the next generation to achieve their full potential. By encouraging students to concentrate on their interests and allowing them to choose their preferred mode of learning, we create a nurturing environment and allow non-traditional students and students coming from all paths of life to become the next leaders, innovators, and creative thinkers.

EXAMINATIONS

The use of continuous formative assessment could be the path of action most favorable in the context of NeurotechEU. Identifying students' strengths and weaknesses in the learning process is the first step to ensuring fair and equitable examinations. By replacing the high-stake exam with a formative assessment, it is easier to control teacher bias and offer the chance to assess the students' entire array of achievements rather than their performance on tests. Other strategies, such as open-book examinations, might be carefully assessed and employed in certain situations or certain parts of the curricula as a way of encouraging problem-solving rather than the ability to remember information. Submission of assignments through academic platforms would make for a way of better storage and management and a more straightforward process.

HR STRATEGIES & STAFF DEVELOPMENT

Staff development and employment of documented HR strategies are the primary aid in ensuring the quality of the educational process. The use of various tools to ease the staff's burden and carry out specific managerial issues, such as chat-bots, is essential. Their use as temperature takers and in the delivery of automated messages ease the university staff's burden, allowing the teachers to spend more time developing other skills. This could help deliver information about grants, schedules, faculty news, and reminders to all students in a more engaging way. In addition, using other technological tools such as conversational intelligent tutoring systems (CITS) for tutoring students who might require extra help could be one step toward ensuring needed support without overburdening faculty staff while also boosting confidence and improving the learning experience. Attention should be given to familiarizing staff with technological advances and with technological tools employed by the university. Organizational aspects should be carefully planned and discussed among all personnel. New practices shall be discussed and approved by staff, and a plan should be put in place to avoid burnout. The process shall be evaluated continuously.

POLICY ENACTMENT

Centralized policy based on stakeholder coordination is the needed approach for achieving NeurotechEU objectives. Policy enactment should focus on the core principles of equity, inclusiveness, fairness, and respect and should include a component of continuous evaluation for assessing the gaps and opportunities along the way. Due to the nature of NeurotechEU, formative evaluation and coordination of policy represent core elements in the process of designing and applying policies, and input from members, students, staff, and EU organizations is of uttermost importance for evolving and adapting to societal changes. Maintaining rigor and flexibility in the process make for key elements of achieving successful outcomes. One valuable element for increasing confidence in the process is represented by transparency in decision-making and enactment, as well as assuming responsibility and correcting possible gaps as new knowledge arises.

BARRIERS AND MOTIVATIONS ASSOCIATED WITH PROGRESSION TO HIGHER EDUCATION

The mission of NeurotechEU is directed toward reducing barriers in the process of education and increasing motivation to progress towards academic and personal development. Firstly, the main barriers should be assessed and defined, employing both literature research and open discussion with stakeholders, especially those most affected. Students, prospective students, and teaching staff should openly discuss their main concerns, the limitations that they have previously encountered or expect to

encounter, and suggest solutions and approaches to the most common problems. As defined previously in the paper, most of the barriers are of socio-economic concern in vulnerable populations. Solutions for these should be clearly stated, from financial support to approaching language barriers through language courses for international students, support groups for ease of integration into the academic life, and employment of more flexible academic programs. Organizational policies would help students coming from disadvantaged backgrounds to gain more academic competencies when entering higher education through bridging courses, the introduction of optional courses in secondary education (e.g., academic writing), and even courses specifically designed for specific groups (e.g., integration courses for refugees, courses to improve competencies in students with learning disabilities).

ALTERNATIVE PATHWAYS THROUGH HIGHER EDUCATION

Alternative pathways should be a focal point, as they succumb to the principles of flexibility and diversity supported by the program. Besides the traditional approach (Bachelor, Master, Ph.D.), shorter study programs, dual degrees, flexible study programs, or hybrid programs could be developed to fulfil various students' needs and reduce drop-out. Traditional pathways remain an option for many students, yet some vulnerable groups might not be able to attend or complete them. Frequently, these students give up an academic pursuit in normal circumstances. By creating flexibility among and inside the study programs, the chances of approaching and following through with higher education increase. Furthermore, said pathways could be a great alternative even for traditional students looking into a more challenging or personalized approach to education or for those who might find more personal or professional benefits from following a non-traditional pathway.

CURRICULUM DEVELOPMENT

One first step of curriculum development involves having multiple stakeholders in the process and drafting their roles and possible contributions. Another primary concern would be for the curriculum to be in line with EU requirements and to follow the principles mentioned in our paper. The curriculum would be developed and continuously improved by incorporating feedback from students, faculty staff, and other important stakeholders. Adaptation of the curriculum should be made concerning the educational pathway (traditional approach, short study programs, dual degrees, flexible study programs, hybrid programs), and it should be kept flexible enough to accommodate various groups of students' needs. The curriculum's primary function would be to ensure the development of skills and encourage creativity, problem-solving, innovation, research abilities, and multidimensional thinking. Courses should be developed following the specifics of the programs and the needs of the professional market, as well as consider students' interests and be in tune with new developments and innovations in education. All information sources should be verified and adhere to high academic standards.

REFERRAL MECHANISMS

Referral mechanisms are one way of ensuring proper steps for providing protection and assistance to a particular target group. Referral mechanisms should be put in place in the form of a document of guidance on referral mechanisms, mentioning all stakeholders' steps. Their development would be carried out after developing a committee, assessing the needs and objectives, and setting up a memorandum of understanding. Funding, coordination, and oversight will be determined, and outreach and data collection mechanisms will be put into place. Feedback mechanisms, both quantitative and qualitative, as well as a strategy for monitoring, evaluation, and reporting, represent former steps into the development and employment of an efficient referral system.

PERFORMANCE INDICATORS AND STUDENT SUCCESS

Performance indicators should be personalized and adapted to the various needs of the students. Besides grades, achievements of all sorts could be included in the evaluation process and set as performance indicators when considering student ranking or application for scholarships. Student success is not limited to exam performance and should be viewed in a more integrative way. Participation and performance in various competitions highlight valuable qualities that could translate

into academic or professional success. Furthermore, involvement with NGOs and student communities, creative pursuits, innovations are all-important insights into the students' potential and can aid in developing valuable personal and professional skills, including creativity, flexibility, community spirit. Academic progress and improvement throughout the program could also be set as an indicator of performance.

TOOLKITS AVAILABLE FOR STUDENTS' INDIVIDUAL NEEDS

Developing a repository of toolkits readily available to students and faculty staff would ensure a more wholesome approach while involving students in their development. Toolkits could be available for a wide array of issues, from admission and managing diverse higher education aspects to specific toolkits for various concerns (e.g., Mental Health Toolkit, Gender disparity mitigation toolkit, Toolkit for students with learning disabilities). The toolkits would ease researching specific information and could be adapted from materials already in use. They could be made available for free on the university website.

PROFESSIONAL DEVELOPMENT AND GATEWAYS TO THE PROFESSIONS

Professional development is another fundamental principle of our pursuit. NeurotechEU is looking forward to bridging the gap between academia and the job market through internships, collaborations, and the development of applicable and transferable skills. The aim is to build future professionals with a wide array of skills who would be able to pursue multiple markets and sectors and ease, to the best of our abilities, the transition from Higher Education to the job market.

Concluding remarks

A summary of best practices implemented across the globe at the level of Higher Education is the initial step in the pursuit of creating and developing the ideas of Neurotech[EU]. By streamlining informed practices and assessing the ability for them to be implemented at the consortium level, highlighting actions already taken by participating universities, and building key recommendations, we are developing the cornerstones for our future pursuits.

There is plenty of innovation that could help higher educational institutions, from teaching tools, supportive technology, e-learning, gamification, platforms for online courses, and many more. All tools that ease the administrative burden placed on staff and students, in some cases, could help better focus the educational process towards creating bridges and connections and towards the attainment of human potential.

Alongside innovation, policies are one great way of approaching and addressing sensitive yet pervasive issues, such as gender disparities, inequities in access to education, the problem of following through with higher education, fear of approaching academia.

The switch to e-learning is a chance for enabling collaboration between teachers and students and a chance for students in many traditional institutions not to be passive receivers of knowledge. Involving teachers and students in the university and study process development is a crucial measure for attaining our objectives.

By learning from the examples of our universities and pinpointing best practices that have already been proven efficient in the context of the EU, we are better organizing our efforts, and we are strengthening connections in the context of Neurotech[EU].

Some limitations still arise, including resource allocation, feasibility concerns, and, in some cases, limited research and support for implementation. Furthermore, cultural, socioeconomic, and political particularities might limit the applicability of certain practices in some areas. Along with this, targeting resources and assessing all stakeholders' priorities can prove to be quite challenging. Finally, external concerns, such as the recent issue of COVID-19, along with other possible economic, political, and social problems, are hard to predict and might interfere with the implementation of our pursuits.
Efforts to define vulnerable populations, map issues of access to education, identify research capacity must be prioritized to support developing a progressive strategy of implementing all feasible and desired best practices for widening access to promote effective use of available time and resources. Continuous assessment of the implementation of such practices in our consortium is a resolution that will be addressed by the quality assurance mechanisms of our project.

With all these considerations in mind, Neurotech[EU] is genuinely committed to creating an inclusive environment based on diversity, innovation, connection, and inspiration and working together to build Higher Education's future.

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