



**DRC**  
Danube Rectors' Conference



# The Future of Research and Education in a Globalized World: a View for and from the Danube Region

**November 2022**



## Danube Rectors' Conference (DRC)

The Danube Rectors' Conference (DRC) is a network of almost 70 universities in the Danube Region. By establishing and facilitating bilateral and multilateral contacts between member universities, the DRC seeks to improve higher education in teaching and research in the region of Central, Eastern and South-Eastern Europe. It arranges conferences, workshops, summer schools, and participates in EU-funded projects. The DRC also actively contributes to the Priority Areas' Workgroups of the EU Strategy for the Danube Region.

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## The Institute for the Danube Region and Central Europe (IDM)

The Institute for the Danube Region and Central Europe (IDM) is a Vienna-based think tank with a primary focus on Central, Eastern and South-Eastern Europe. It offers expertise on and from the region and serves as a platform for stakeholders from academia, politics, the economy, administration, culture, media and civil society. The IDM contributes to knowledge transfer in the region through events, publications and podcasts. The DRC Permanent Secretariat is operated by the IDM.

@IDMVienna





# Future Realities of Academia and Research

## DRC Strategic Foresight Project



### Introduction

#### WHY

Less than twenty years from now, can you imagine what our ever-shifting world will look like? Will knowledge, science and research take their rightful place in this world as seekers of truth and understanding? And what role will universities play in this process as research initiators, science bearers and knowledge brokers?

In 2022, as part of the project "The Future of Research and Higher Education in a Globalised World: A View from and for the Danube Region", we conducted a strategic foresight and projected various future scenarios regarding the world of science, university and academia in the region of Central, Eastern and South-Eastern Europe in the year of 2040. We have chosen this year not only to find a suitable consensus between short-term and long-term projecting, but also to provide current representatives of universities, decision-makers and other stakeholders with advice on what strategic pathways they should start to follow now and how they should decide within their scope of action. This is because we believe many university processes and policies in the region urgently require measures, and these must be taken now.

Urgency, together with the current and future relevance and gravity of the issue, were also important factors in the selection of specific thematic areas of the project. As exceptional and diverse as the countries of the Danube Region and their complex socio-political systems are, in the case of science, research and higher education, there are specific areas that are burdened with similar barriers and challenges, but also offer viable possibilities and opportunities. All these developments need our immediate attention and should be given suitable solutions.



## WHAT

There are four thematic areas within the project upon which strategic foresight was implemented and, additionally, policy recommendations were developed:

### University Autonomy and Governance

University autonomy and academic freedom represent a core principle in the functioning of an institution of higher education during its process of fulfilling its crucial mission of producing and disseminating knowledge. Particularly in the Danube Region, the limitation, undermining or destruction of university autonomy is becoming more frequent as a result of political reforms and the establishment of informal power structures within the respective young democratic systems.

Through the lens of different types of university autonomy, we take a look at how we can ensure the long-term independence of universities and higher education in the region. Moreover, we map out possible developments concerning the principal organisation of individual educational systems where the universities remain open spaces for research, education and innovation, come under the firm control of external actors, or are replaced by different educational institutions and platforms altogether.

### Science and Learning in the Digital Era

The Covid-19 crisis proved to be a significant impetus in the long-term trend of digitalisation in higher education and learning. Distance education and remote learning has become a daily experience and a new normal, even for digitally less-prepared universities in Central, Eastern and South-Eastern Europe. Innovative digital education emerging from the all-encompassing digital transition of our age can, on one hand, support open, transparent and flexible research and schooling.

On the other hand, however, it also brings with it many drawbacks, such as challenging the interdependency of both student and student-teacher relationships, as has been seen in the months during the pandemic. In this regard, we outline possible scenarios, including the continuation of insufficient digital development of higher education in the region, the creation of balanced conditions between offline and online education, or the strong use of digital technologies on the grounds of decentralised and restructured educational processes.





## Scientific Research for European Decision-Making

Climate change, globalisation, migration and demographic shifts are just a few challenges the whole planet is facing, which also have an impact in the countries of the Danube Region. Universities and their research centres constitute an important component in providing evidence-based solutions addressing the above-mentioned global challenges. In addition, the war in Ukraine not only fundamentally disrupted the continuity of higher education in that country, but at the same time, within the framework of the country's reconstruction, it brought attention to the pre-existing questions of the relationship between research, state institutions and the business sector – three elements shaping decision-making (not only) at the European level. We envision a common European space of higher education that is accessible to everyone – supranational educational processes enabling unlimited mobility across the continent, and transnational scientific projects playing an indispensable role in this European academic world.

## Employability of Students and Early-Stage Researchers

With the advancement of European integration, the conditions for employability of students and university graduates are constantly changing in a manner that often rather negatively influences both the institutions of higher education as well as the labour market in the Danube Region. While the European Union is moving towards instituting the so-called European Education Area, building on the well-established Europe-wide recognition system (Bologna Process), the free movement of talent has also, to a certain extent, facilitated undesirable developments such as brain drain, underemployment, or the lack of human capital in the so-called underdeveloped regions. Aware of the importance of university-educated experts for many areas of European economies, we focus on several future scenarios that analyse various developments in the employment of university graduates, particularly ones coming from the Danube Region. We explore the limits of interaction between universities and the needs of the labour market, the connection possibilities of university environments and work fields, as well as fractured, multi-speed development scenarios that ignore the real capacities and needs of the Danube Region and beyond.



**The project focussed on engaging university students, early-stage researchers and young scientists in the debate around the future of higher education and research.**

Eighteen selected participants with different academic and professional backgrounds coming from ten countries of the Danube Region proved to be an excellent sample of young academics and experts. They have been able to adequately analyse future challenges and opportunities of the academic, scientific and working world in the eastern part of the European continent. I am also convinced that they provide decision-makers with valuable projections on the future developments of higher education in the Danube Region from the unique perspective of young experts.

Unfortunately, the Russian invasion of Ukraine affected not only the organisation of project meetings, but also the participation of project members. As the situation in their country did not allow them to participate in the physical meetings, our two male Ukrainian colleagues were forced to contribute to the entire project virtually. At this point, I would like to thank from the bottom of my heart not only them, but also our other project members from Ukraine for their dedication, perseverance and for their valuable contribution to the entire project despite the tragic and challenging conditions they were exposed to.



## HOW

The DRC Strategic Foresight project was funded by the Danube Rectors' Conference (DRC), and conceptualised, coordinated and implemented by the Institute for the Danube Region and Central Europe (IDM).

Although the project coordinator tried to carry out the project in the form in which it was originally designed, external factors beyond one's control present an element that sometimes fundamentally changes the implementation of the project. This was the case with the DRC Strategic Foresight, in which three in-person meetings took place. In addition to Vienna, where the participants got to know each other and received crucial insights into the strategic foresight methodology, and Maribor, where this publication has been presented, we were also supposed to meet in Uzhhorod, Ukraine, in the framework of the 17th DRC Summer School.



**DRC Strategic Foresight  
Project Coordinator**  
Daniel Martínek

Daniel Martínek works as a Research Associate at the Institute for the Danube Region and Central Europe (IDM) as well as Manager of the Permanent Secretariat of the Danube Rectors' Conference (DRC) in Vienna. He has extensive experience in cross-border, regional and international cooperation together with sound knowledge of the macro-regional strategies of the EU, particularly the EUSDR.

However, the major escalation of war in Ukraine ultimately did not allow Uzhhorod National University to host the 17th DRC Summer School. Not only has the DRC fully supported its member universities in Ukraine throughout the war, but it always believed that one day it will be possible to implement the summer school in Uzhhorod. In this way, I would like to thank Uzhhorod National University for all the support, active membership in the DRC network and its offer to host the DRC Summer School, which we look forward to implementing.

Therefore, the 17th DRC Summer School was eventually held in Vienna, organised by the IDM in July 2022, during which the project participants had the opportunity to get feedback on their strategic foresights not only from the participants of the summer school itself, but also from experts in various fields. This appropriately contributed to the revision and improvement of individual texts. Finally, I would like to thank the University of Maribor for hosting the DRC Annual Conference in November 2022, where this publication and the project results have been presented to the public for the first time.

Along with the three onsite meetings, several online meetings have been organised, during which the authors developed their future scenarios according to a specific strategic foresight methodology. Focussing on the year 2040, we firstly explored and analysed currently existing conditions and processes in the areas of higher education and research in the Danube Region, and identified the most significant trends and changes that, due to their importance and relevance, may have an impact and implications on the future of this sector in individual thematic areas. Building on this analysis and the identification of existing realities, several future scenarios were developed that represent different versions of the future of universities, academia and research in 2040. In doing so, four future versions were invented: probable, possible, preferable, and a wild card scenario.

Despite differing from traditional forecasting and desirable future predicting, as well as being based on the evidence of current trends, the presented futures were determined by out of the box, unconventional and creative thinking, which is of crucial importance in every strategic foresight. And while some predictions may seem unrealistic, the backcasting and formulation of policy recommendations, on the other hand, represent a set of well-thought-out steps and actions that should (or should not) be taken in order to achieve a particular future.



**The project implementation would not have been possible without the generous support of the Danube Rectors' Conference and its member universities. Above all, the members of the DRC Presidency – Zdravko Kačič, Ivanka Popović, Friedrich Faulhammer and Miroslav Vesković – have not only been the project initiators, but also supporters throughout the whole duration of the project.**

I am extremely grateful to them for putting their trust in me and giving me the freedom to prepare the overall concept of the project, its thematic content and structure. I would also like to thank Sebastian Schäffer, IDM Managing Director, who was always willing to give me advice when dealing with project perplexities.

My utmost gratitude goes to Chiara Maria Murgia, who assisted me during the main phase of the project. She participated in the preparation of the project call, took part in the selection of participants and was my right hand during the meetings. She contributed to both the organisational and content side of the project, for which I thank her.

The success of this project could not have been achieved without the people who were involved in the various phases of the project. At the beginning, we obtained a clear explanation of the methodology of strategic foresight from Velina Tchakarova, Director of the Austrian Institute for European and Security Policy (AIES), while on the example of climate change, we realised the relevance of future prediction and its importance for decision-making, as explained to us by Verena Winiwarter, Professor at the Institute for Social Ecology at the University of Natural Resources and Life Sciences (BOKU).

During the later stage of the project, we received constructive feedback and valuable input on the project results from Enora Bennetot Pruvot, Deputy Director at the Department for Governance, Funding and Public Policy Development at the European University Association (EUA). Finally, useful observations and comments on the texts were provided by the participants of the 17th DRC Summer School. My thanks go to them and to the above-mentioned experts for their availability and willingness to support this project by sharing their knowledge.

Moreover, I would like to acknowledge the excellent cooperation with Jack Gill, IDM Research Assistant, who, as a native English speaker, ensured the grammatical correctness of every page of this publication. I cannot thank enough Christopher Radovici, who, in collaboration with his colleagues at Novus Ordo Media company, bestowed this publication a visual identity that contributes to the clarity and comprehensibility of each chapter.

Over and above, I am beyond grateful to and sincerely applaud all the project members and authors of this publication. Despite their other personal and professional duties and obligations, they tirelessly and actively participated in all parts of the project, devoting their valuable time to this project even beyond its schedule. Without their commitment, this endeavour would never have been realised and this publication would never have seen the light of day. I am convinced that this symbiosis of their determination, distinct knowledge, rich experience and diverse backgrounds were the key to the creation of fascinating future scenarios and deliberated policy recommendations presented on the following pages.

I hope this publication will be an engaging read for all local, national and European decision-makers, stakeholders, university executives and staff, as well as the general public, and that it will show everyone the different paths higher education and research in the Danube Region can take. Some of these paths are thorny, others are simple, some lead to a drastic transformation or the demise of universities as we know them, others represent the bright future of university as an open place enjoying institutional independence and scientific debate. Let this publication contribute to the understanding of the main processes in higher education that lead to these various future realities of academia and research.



# Introductory remarks by the DRC Presidency

*Thinking of the topic of foresight, one cannot avoid the thought that after natural disasters, crashes of the stock exchange and the resulting economic crises, pandemics, and other catastrophic events, we frequently hear questions like: “Could we have prevented this?” or “Could we have been better prepared?”. The desire to explain the causes and consequences of events that influence our lives is a natural reaction of man and probably a part of our survival instincts.*



**President**

**Prof. Dr. Zdravko Kačič**

We remember dramatic events in our history, like plagues/pandemics, as well as many wars from ancient times and the medieval era up to the present time. And one always wishes to have known better before all these events – maybe they could have been prevented or at least their impact minimised.

In the past, the desire to foresee the future was mainly related to natural disasters and events influencing our harvest, travel, health status, and other primarily natural dangers. This wish is not new at all. In the past (but still today!), predicting the future often involved a lot of creativity due to the lack of other methods available today. Just remember the many examples of predicting our future from the coffee grounds in our mug, from the crystal ball or cards with symbols of health, wealth, love, poverty or disease or even death carefully placed on the table in front of us. Or, to be more “scientific”, the frog in the glass bowl climbing the ladder to predict the weather. Even today, many believe in their horoscope, and all explanations sound very scientific. Well, maybe the octopus predicting the result of a football match is not a good example of scientific foresight, or is it?

Man has always wanted to know what was coming. With time, humanity grew in its ability to research its environment and draw conclusions from the information gathered. We know it will soon rain when we see dark clouds in the sky. However, it might be too late to catch an umbrella or get to a safe, dry place, and we wish to know earlier than the appearance of the clouds. So, we developed weather forecasts for a more extended period of time (sometimes even for a complete season) to be prepared on our farm, on the way to the office, or even on holidays. Yes, weather forecasts are not always accurate, but the same is valid for glass bowls, horoscopes, and other ancient methods of predictions. And, disregarding the time period, the status of science at the time and the forecasting method, all the methods are based on data or information available to the forecaster.



**Vice-President**  
Prof. Dr. Ivanka Popović

The more information available, the better the forecast, or in other words, the more we have witnessed in the past from comparable situations, the more we know about the development of specific indicators in the future and the better we can guess the probability of a future happening/repetition of the experienced past event.

In the recent past, we have gotten the feeling that major events influencing our quality of living, welfare, health or even existence cumulate and occur more frequently. The periods between economic crises, natural disasters, and pandemic situations are getting shorter and shorter. We want to predict them more and more successfully, as we do not wish to lose our standard of living. The higher our standard of living, the more we can lose and the more we are prepared to invest to maintain the quality of living we have been so used to in the past fifty or even more years.

While crystal balls, cards, frogs, and similar have become methods of the past, we today use digital technologies to collect and interpret data surrounding us, indicating the future events relevant to our lives.



**Vice-President**  
Mag. Friedrich Faulhammer



We are aware of the so-called butterfly effect and constantly seek the butterfly causing the effect for each event we want to predict. Yes, the recognition that we cannot prevent harmful events is a horrible one, but it is inevitable. Inevitable, really? Was it so unpredictable that the stock exchange crash in 2008 would happen as the real estate market balloon exploded? Thus, to be prepared for the storm caused by the butterfly, as we are not able to prevent it, we need to know as soon as possible that the butterfly has made his move. We decide to enable ourselves to foresee the next pandemic, the next stock exchange crash or the next war or natural disaster. We are all aware that we cannot prevent everything that is coming in the future, especially immediate natural disasters or diseases. Still, we can take actions to find out and follow their early signs and, in this way, predict their appearance, so we can better prepare to overcome them and survive.



**Honorary President**  
Prof. Dr. Miroslav Veskočić

Foresight is not such a new term, as it has already been applied for several decades. The first national foresight report was published in Japan in the late 1970s. Foresight is applied frequently in the USA, Canada, Japan, and other countries. In Europe, we seem to lack behind somehow.

The following questions, which describe tackling challenges, define “foresight”:

How to establish the indicators (prior events) that cause the future event?

How to measure them and interpret them in the right way?

How to prove the accuracy of the interpretation and convince everybody to take action?

What can help to lower the impact or prevent greater damage?

The Joint Research Centre established a competence centre for foresight in June 2018, motivated by the European Commission’s desire to make the EU more geopolitical and stronger in the world by reinforcing the use of evidence and mainstreaming foresight into EU policymaking.

Since then, the term foresight appears in more and more strategic documents in higher education. Slovenia is about to take over the presidency of the European Union Strategy for the Danube Region, and in its work plan, within the priority area of Knowledge Society, the term foresight is introduced in connection to future jobs.

To involve the strategic planning of higher education institutions in the future common European Higher Education and Research Area, the higher education institutions should learn how to direct their research and education towards the future trends and thus provide solutions to future challenges, such as future jobs.

Knowing what knowledge will be needed in the labour market ten years from now would enable higher education institutions to provide the necessary knowledge to students and thus address the needs of employers better. The same is valid for societal challenges as we face the problem of an ageing society and the environmental challenges that dramatically endanger our existence. We all hope that we did not wait too long to start with a more information-based and founded planning of our future activities.

Danube Rectors' Conference conducts a project titled DRC Strategic Foresight Project. Students from DRC member universities took part in a workshop on strategic foresight, and their results are presented in this publication. The Danube Rectors' Conference embraced the initiative of the European Commission and started the DRC Strategic Foresight Project. It is understood to be the beginning, and it must be in the interest of all DRC member institutions to participate in reforming their strategic planning to be better aligned with the needs presented to them by their local, regional, European and even global communities.

We all need to learn how to manage our future and especially educate and train the younger generations to do so in a consistent, sustainable, and smart way. The fact that there are so many fields and challenges in front of us makes it also a necessity to develop proper tools and instruments to define, collect, process, analyse, and interpret information relevant for the prediction of relevant future events. For instance, there is a need for a certain profile of experts in the field of autonomous green driving/transport, decentralised and locally available healthcare and other services for elderly people, new job environments in demanding branches for middle-aged employees for a longer worklife, and qualifications for people at risk of being victims of digitalisation, etc.

**The Presidency is very satisfied that the young students and scientists took part in the project in such a number and from a variety of fields and that we can see the outcome of their endeavours in this publication. We look forward to seeing more of this and shall foster the continuation of the DRC Strategic Foresight Project in the future.**



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# University and Governance

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# Autonomy Finance

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*“Let us be honest with ourselves: Universities have not been the same for 10, 15 or 20 years. Yes, we are still in trouble. But higher education has been in trouble regularly throughout most of our history. And it likely always will be. Anyway, we still enjoy our autonomy and freedom!”*

## 1. Introduction

Education serves as a foundation of a healthy society that can define and follow its own principles and core values, while also adapting to new challenges. That is why the future of education often evokes lively discussions. During the last few decades, various trends have shaped the autonomy of the educational system. New actors have entered into the provision of education, and the system has been influenced by political interests, but the pandemic has also played a key role in its current transformation.

*This strategic foresight aims to provide a brief summary of the topical challenges and transformational powers that are of concern for the freedom of universities from a perspective of the Danube Region.*

While defining the influences that shape levels of academic institutional autonomy, we consider technological, political, social and economic challenges. From a methodological perspective, for the analysis of such a multifaceted topic as the autonomy of universities and their governance, we have chosen to approach it from both theoretical and practical perspectives.

From a philosophical perspective, autonomy refers to self-determination and self-governance. Translated to the functioning of universities, it means that each institution should have its own value system that is independent of national or global ideological narratives. In practical terms, university autonomy – as identified by the European University Association – has the following four dimensions: academic, financial, staffing and institutional autonomy.



While exploring the topic, opposing currents have been identified, such as the privatisation and de-privatisation of universities. After identifying topical trends and challenges as entrepreneurial thinking in university governance or corruption, which is especially present in the Danube Region, four scenarios have been developed with various likelihoods of realisation.

The main trigger of our possible scenario is the marketisation of education, including universities. Our probable scenario is characterised by the influence of political and ideological perspectives in the field of education, such as war, ideological tensions, and the like. Meanwhile, the preferable scenario is one of inclusivity and easy access to university education, with the help of technological breakthroughs. Last but not least, our wildcard scenario leads us to a situation of absolute power of NGOs and think tanks to determine education, where no central institutes exist and education takes place in a fully decentralised manner. Indicators are identified for each of these scenarios, and possible methods of prevention or encouragement are proposed.





# 2. Meg

## 7 Political influence in academic affairs

7 The political polarisation of society in the Danube Region did not leave higher education unaffected. Academic affairs, such as the defavourisation of certain degree programs, and the favourisation of others are highly influenced by the topical political power and interest.

## Shift in the role of higher education

Higher education institutions merely serve market interests and reshape degree programmes by market demands, which leads to an indirect power of influence coming from the market and causes an ambiguous effect on the ecology of higher education.

2

## 3 Dependence on research metrics

3 The position of policymakers throughout CEE on “as-much-as-possible” implementation of research metrics indicators turns into an imitation of reform, violates academic freedoms and does not contribute to progress of the academic community in the Danube Region.

## Corruption and other symptoms of power abuse

Power abuse is still an issue in disguise in all European countries and the problem of academic integrity polarises the Danube Region. It remains in old control governmental systems, but also adapts to new highly autonomous environments. Further diversification without action leads to bigger gaps between certain countries. The issue to consider is how to eliminate all kinds of power abuse at all levels of its life cycle.

4

## 5 Hybrid warfare

5 The nature of war has changed fundamentally over the last few decades. The growing probability of regional military conflicts, with their disastrous consequences for infrastructure, students and employees, drives governments to provide incentives for the prompt adjustment of educational processes to the warfare circumstances.

# atrends

## Dramatic decrease in student numbers

The reduction of budget revenues from students' financial contributions (national, EU and non-EU students at BA, MA and doctoral level) has an impact on staffing autonomy - the reduction of the number of students leads to the decreasing of teachers' workload and reduction of staff.

6

## Lifelong learning

7 Lifelong learning is an important area of any modern education system worldwide and especially in developed countries. The ultimate goal of the development of this approach is the idea of creating a "learning society". In the Danube Region this segment of education does not have mutual trust between its informal and formal branches. There is also no single universal and lifelong learning model in the Danube Region, nor is there a clear conceptual framework.

## Digitalisation fosters diverse tools for university management

With the right to decide on formats of learning, universities can allocate finances, balance the number of working staff and start renewing degree programmes more flexibly.

8

## Decentralised educational platforms

9 The growth of NGOs and think tanks is a result of global processes, such as decolonisation, globalisation and the rise of differentiated social and political issues that governments do not address. These independent units are not only involved in policy making, but also offer educational services in different formats. On the one hand, they are more easily accessible than degree programmes, which partially solves the problem of inequality in access to education. On the other hand, there is no global quality assurance policy created to allow a centrally defined system to measure the standards.

## Inequality in access to education is growing

Equitable access to education is considered to be the cornerstone of increased community capacity for societies throughout the world and poses a deep challenge for higher education. The current environment of COVID-19 and the resulting distance learning has made equality of access to education a more pressing issue.

10



# 3. Scenario developing

## 1. Atlas Shrugged Possible scenario



*With the growing trend of marketisation, the university is no longer perceived as a community of scholars and knowledge-seeking students, but as a marketplace for ideas where valuable knowledge is produced, exchanged and consumed. In other words, it is transformed from a public good into a market-based commodity.*

There is a withdrawal from publicity that extends to values, budget and governance. Public universities are run as if they were private, with contempt for the public interest, and gradually are transferred to private ownership. University autonomy as a tool is directed to satisfying clients' needs. If there is no market demand for a certain course/programme, it is excluded from the curriculum. All of the latter are developed aiming to answer private sector demands. As such, academic institutions offer more and more English programmes and classes to increase fee-paying international student numbers. Important to note, without the government's intervention, the costs of education services are unaffordable for a great many individuals.

The university funds, coming from the standpoint of financial management generating an attitude towards different university departments as assets, are based on borrowed money and risky investments. Universities now have more capability to diversify study programmes and manage internal resources.

On the other hand, 'autonomous' decisions are viewed as not legitimate enough and the product of one's own interests.

The part of privatised universities that came from the public sector serves as a ‘safe pillow’ against poor education services. However, more autonomy, which has stimulated overall accountability, has in fact also caused the opposite effect on education quality in some Danube Region countries. Without established values and transparent work, it has divided the region into peripheries and broken the cohesion in autonomy evolution.

Individual salary levels at universities are differentiated and given in larger amounts to higher-ranked academic staff. Excess of freedom to run recruitment and promotion procedures weakens the quality of the human resources and keeps the society away from transparency and trust. However free it may seem, in fact, the corporatisation of university transforms it into an integral part of the industrial complex and closely ties it with strong economic and political interests. Academic success is measured with globally applied tools and academic institutions lose their autonomy, which means that no real autonomy is cultivated and factual dependence on the market and big corporations is ensured.



## Recommendations

### Organisational autonomy

To organise a structure of internal governance of universities it is necessary to transition from the traditional self-governance model to a model of managerial self-governance focussed on efficiency and results; avoid any imbalance in the multi-dimensional cooperation between the state, business, and civil society, as it complicates the implementation of the general educational strategy, as well as the transparency and democracy of the educational process.

### Financial autonomy

Regulate university funding criteria; develop clear rules for universities to get permission from the government for borrowing money; develop legislation for the long-term planning of university budgeting and the use of block grants; avoid inadequate legal regulation in defining criteria for university funding and limiting the possibilities of long-term planning of university budgets.



## Academic autonomy

Ensure long-term thinking when introducing or terminating degree programmes. Consult with heterogeneous advisory boards with policy officers, researchers and policymakers to identify long-term social challenges when subjects do not get funding, particularly affected are subjects related to identity politics in the CEE region; avoid using the current market situation as a reference for the role of education that has to serve them, and ignoring coming social challenges, such as migration issues and questions of identity.

## Staffing autonomy

It is important to assure high-quality professional staff on the stage of factual work rather than controlling recruitment processes; it is recommended to set minimum salary regulations for academic and administrative staff. Professors and senior lecturers should be the only regulated positions.

## 2. The Empire Strikes Back

Probable scenario



*In the coming decades, the global environment will undergo qualitative shifts. Due to a number of internal and external challenges, Europe has reached a critical time. An integration policy will not work anymore, and that means the end of the “European dream” with all the disastrous consequences and unprecedented costs no European citizen is yet aware of.*

There is the breaking-up of the European Union and the rapid decline of Europe in a dramatically changing world, accompanied with polarisation, fragmentation, the emergence of new powers and increasing uncertainties, threats and catastrophic events.

Rising assertiveness from Russia, geopolitical rivalry between the US and China, and the unstoppable rise of populism may lead to a full-scale war in Europe, thus triggering the numerous erosion processes in education throughout the whole Danube Region.

Academic institutions are shaped by political interests, national narratives are reinforced, and the distance between universities and public authorities falls sharply; special guidelines are developed into domestic policy to protect universities from military use; the society is polarised, and inequality in access to education is getting more common. Interrupted or abandoned education is another devastating side-product of war, and universities are targeted for attacks and relocated.

A lack of solidarity complicates coordination, enables de-democratisation of governance and accountability management. The academic community and the public are excluded from university management. Traditional proportions in the structure of university are shifting with a decrease in the share of teaching staff and an increase in the share of administrative staff. Universities have more administrators than academics, which predicts the emergence of “all-administrative university” and, at the same time, leads to the destruction of university autonomy in its traditional sense.

The main challenges that become relevant for relocated students and universities are logistics, coping with refugees and IDPs, lack of technical facilities, as well as bureaucratic obstacles that arise at a new place of study, poor communication and adaptation in society. Insufficient funding directly affects other dimensions of the educational system. For many countries in the region, questions on who is the main investor in education and what are the proportions of funding from various sources become crucial. Extra-budgetary revenues remain in higher education institutions, and universities have the right to manage them independently.

However, as financial autonomy is constrained by the state, universities lose many if not all rights to recruit, dismiss and set salaries for academic staff. Staff reduction is also controlled by the state. The turbulent economic situation causes strict governmental control over salaries. All academic and administrative staff have their civil status retained or renewed.



The Future of Research and Education in a Globalized World: a View for and from the Danube Region

## Recommendations

### Academic autonomy

Curricula do not reflect the short-term needs of the job market and students are more attracted by more fast-paced learning pathways, such as on-the-job learning, short individualised workshops etc.



## Organisational autonomy

Fix the university governance model by adjusting managerial mechanisms for the terms of martial law; provide access to education for internally displaced persons (IDPs) and refugees; launch special legislative procedures for the relocated universities, considering their special needs. As universities are in fact not able to meet certain common standards, it is inappropriate to keep strict requirements for accreditation and licensing in view of the lack of infrastructure, staff and other facilities, number of students and faculty relocation, etc.

## Financial autonomy

Further reforms of financial autonomy should be aimed at increasing the funding period of universities, and they need to develop their own long-term financial strategies. It is also important that measures of rigid autonomy, applied by governments as a result of the economic crisis, do not lead to increased control and direct intervention in university budgets; spraying expenses for science and education should be avoided in the economy of the Danube Region. To solve the problem of financing education it is necessary to develop the mechanism of distribution of these funds and the diversification of funding sources.

## Staffing autonomy

The main strategic aim is to assure the work of institutions and staff under long-term conditions of uncertainty. It is necessary to:

1. Set national regulation on salaries and recruitment to ease formal processes for long-term work.
2. Make unified recruitment procedures for displaced academic staff to be hired by other universities.
3. Ensure back-up staff availability in case of disruptions in education processes.



# 3. Make University Great Again

## Preferable scenario

*In the future, universities will be open and socially involved, their core values will be preserved. In 2040 universities of the Danube Region enjoy a good level of autonomy and have the opportunity to make strategic choices regarding issues related to organisational, academic, staffing and financial autonomy.*

The structure of universities will be hybrid (influence of covid-19 and war), and they will be both physically and virtually open. The physical universities will remain vitally important as a place for social interaction and communication. The virtual universities make the university ubiquitous. The mission of the Universities of the Danube Region will be a unique combination of different activities, including teaching, learning, research, innovation and culture (synergies), and actively promote lifelong learning. In 2040 universities became engines of social change. They provide an open space for research, education, innovation and culture. In collaboration with stakeholders, the future society will be formed and driven by knowledge. Those collaborations will actively promote lifelong learning. The future of universities in the Danube Region is transnational. The cooperation of the universities of the Danube Region will ensure high-quality teaching, learning, research and various innovations. Universities of the Danube Region will keep working in partnerships in order to build capacity and will form a teaching, learning, research and innovation community in order to develop their potential and exchange opinions on various areas of university management. They will provide quality teaching, research and innovation and at the same time they will contribute to the expansion of knowledge for everyone.





# Recommendations

## Financial autonomy

The Danube Region needs additional investment in education, research, and innovation to meet today's challenges. Only a clear idea of a well-thought-out budget can succeed in defending any effective financial autonomy. For universities in Danube Region to achieve their strategic goals, financial autonomy is crucial, and so limitations in this area are considered particularly significant. Universities need to develop their own long-term financial strategies. It is also necessary to regulate the retention of excess funds by universities, on which there are strong restrictions. It is also important that austerity measures implemented by governments as a result of the economic crisis did not lead to increased government control and direct intervention in university budgets.

## Staffing autonomy

Universities of the Danube Region need good leadership to take universities into the future; constant professional development of university staff in all areas of university management is needed. Investment in academic and professional staff and their development is essential to support them, (financial incentives, free access to international work, personalised professional and/or academic growth).

## Academic autonomy

To improve provisions on the protection of the rights of scientists and students, which constitute academic freedom; use academic freedom barometers as a tool for measurement; emphasise the importance of academic freedom to the public by reinforcing science communication; providing universities with the necessary conditions for the acquisition of skills, knowledge, additional qualifications for applicants from the business environment, including outside the student age and at any stage of life; cooperation between the university and business in the formation of a fixed programme of courses, modules, major and minor disciplines, plans for guest lectures by delegates from enterprises and public organisations for students of bachelor's, master's, doctoral and advanced training courses; introduction of conditions for student internships to gain practical experience in the field of business and provide conditions for further employment.

## Organisational autonomy

Improve regulatory frameworks at the national and European level regarding financial, staffing, organisational, and academic autonomy. This will help strengthen and protect university autonomy, enabling institutions to make strategic decisions. Universities of the Danube Region need the constant professional development of university staff in all areas of university management to ensure good leadership; strengthening collaboration among universities and overcoming legal barriers to cooperation between universities through the establishment of a legislative framework facilitating transnational cooperation in research and innovation between universities.



# 4. Universities are so 20th century

## Wild Card

*In this low-probability, high-impact scenario, universities completely lose their current status of acting as centralised educational platforms. Instead, think tanks and non-governmental institutions representing different political and social-economic interests take over the ancient role of universities, offering a wide range of curricula shaped by those spheres of interest that founded them.*

In this scenario the question of academic autonomy does not play a role anymore, as we are talking here about fully autonomous actors and their sources of power, be they political or economic. As NGOs and think tanks depend on the financing of their founders and supporters, they more or less represent the viewpoint of those interests.

The view that only public higher education provides equal access and social elevators for the population, whereas other forms of HE pose a threat of withdrawal from this ideal, does not exist anymore. Universities will, rather, become co-working places for experimentation and networking for people and companies. An increasing proportion of higher education enrollments will come from company-sponsored, short-term certificate programmes and boot camps.

As we can already see misuse of power in cases where academic freedom is threatened by state politics, the same is likely to happen when the curriculum is defined and managed by decentralised entities. However, these entities also have the potential to abolish the barriers that HE sets against less privileged members of society. On the other hand, there are no policies set to grant equal funding that would ease access for everyone equally. Corruption may arise without central tracking of spending and source of fundings.

### Recommendations:

Avoid the “balkanization” of universities through fragmentation of their structures into self-interested departments within faculties in HEI, especially in those with revenue-based budgeting, rendering them more inefficient and less capable of harnessing institutional potential.

Design a well-thought-out budget and a new institutional structure to defend effective financial autonomy. Prevent those from disadvantaged backgrounds being excluded from education by expanding NGO presence in rural environments.

Keep quality control of services through establishing a common agency for quality control of educational services to ensure mechanisms for accreditation of some curricula and programmes for domestic universities.

Policy setting about clearly indicating the funding sources of every think tank, NGO and academic institution in their impressum.

Ensure the code of conduct of non-academic educational institutions by authority control or policy settings; in this scenario NGOs and think tanks have total freedom in choosing their methodologies and which “students” should be accepted.



# Science and in the digi



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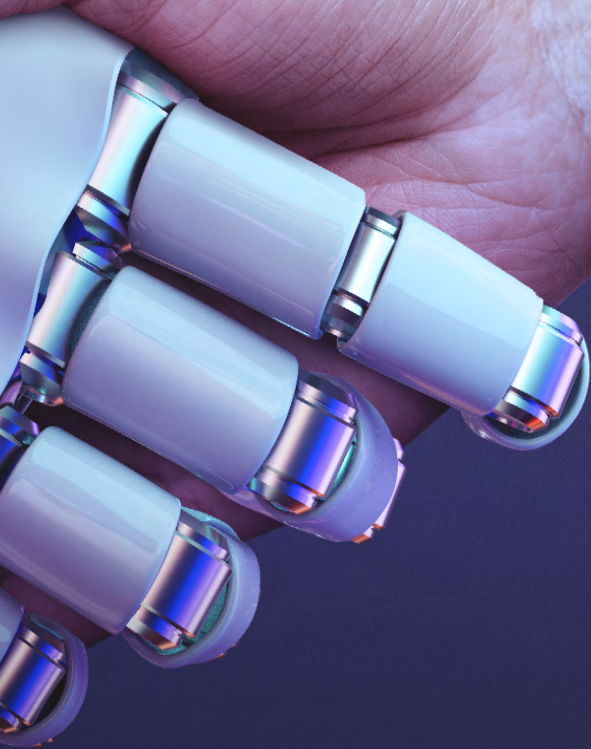
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# nd learning tal era



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*“If you are reading this in 2040, that means that we survived climate change, or we are fighting hard to survive, and that, probably, one of our five scenarios has played out. However, we hope that the “Back to the future” scenario did not happen and that you are enjoying the perfect symbiosis between digital and old-school teaching.”*

## 1. Introduction

The current crossroads of technological advancements in digital education and research processes enable diversified, engaging, and flexible learning and research environments. But these endeavours challenge established interaction patterns between or amongst students, professors, experts, or staff. However, many institutions had limited capacities to transcend traditional boundaries toward electronic realms. A palette of new technologies and digital solutions were either incorporated or integrated at an exponential pace into pre-existing educational systems across the Danube Region, shifting the lenses through which we understood learning environments.

*Because of its complex socio-economic consequences, the COVID-19 pandemic proved to represent a core momentum for the digitalisation of higher education, particularly when numerous tech-driven methods and approaches became part of learning routines.*

Large-scale digitalisation was impossible to fully achieve in such limited time spans, forcing local and regional providers to create blended environments. Hybridisation, with its own specificities, allowed us to experience new interaction formats and observe significant learning and research transformation. Educational approaches, adapted from memorisation-driven, industry-oriented, reproductive models, shifted towards socially integrated, network-shared, collaborative, and integrative co-creationist formats. Even though such processes led to more accessible environments, higher institutions have retained primacy or at least a primordial role related to the design, creation, research, promotion, or distribution of knowledge.



However, large-scale digitalisation and long-term exposure solely to fully remote mediums could lead to an incomplete or unsatisfactory learning experience, potentially resulting in the underdevelopment of capabilities, adaptiveness, awareness of surroundings, and community inclusion. In addition, other constraints must be accounted for, as digitally-driven activities cannot be employed at peak performance if there are infrastructure gaps or voids, inadequate adoption, reduced technological literacy, lack of uniformity and standardisation, unsecured systems, and other obstacles.

How could we steer current-day trends to ensure they serve everyone across the digital systems, alongside a post-fact/non-human/post-digital society in the Danube Region? What will science and learning look like by 2040 in these countries? These prisms of understanding are conceptualised, presented, interpreted, and addressed across the following pages. An instrumentalisation of the five proposed scenarios enables us to gain an overview of ramified prospective avenues, already available at the current crossroad, as it triggers a reflective process on the ways we can either prepare to face them or be able to generate them, by anticipating an array of challenges, opportunities, and outcomes which could be optimised.





# 2. Meg

## **We are gaining insight into the ways human learning works, but it still remains a “black box”**

**1** Since enhanced learning is enabled by the digitalisation of education, we need to improve our understanding of the former in order to maximise its usage. Moreover, tests like PISA showcase how the Danube Region’s pupils think, analyse, communicate and apply knowledge differently, levels which make the university-level acquisition of information difficult, if left unimproved.

## **Teaching approaches are evolving and becoming student-centric**

Pandemic alterations proved that a qualitative educational act can be achieved through digital means, particularly when set side by side with student-centric teaching formats. However, teaching and learning practices vary significantly amongst Danube countries.

**2**

## **Digital solutions and technology are changing how human interactions are conducted**

**3** Even though inter-human exchanges represent a core benefit of face-to-face education, being a core element of the learning processes, new generations explore alternative ways to achieve it digitally. Human relationships and networking are important benefits of non-virtual classrooms and are important elements in the learning process, and new generations are finding ways to achieve this even with digital technologies.

## **Technological and digital expansions offer a plenitude of exponential developments**

Primarily as the technology already leaped forward during the outbreak and its cross-sectorial pace, from development to implementation, seems to have reached record levels.

**4**

## **Although there is a shrinkage of discrepancies regarding access to digital solutions, they remain present, limiting envisioned growth across the Danube’s educational sector**

**5** A proper establishment of modern learning and science requires harmonised infrastructural and architectural access, aspects which still vary deeply across the regional, national, subnational, or even individual levels.

# atrends

## Technological adaptation and adoption have increased, but they are still not streamlined enough

This aspect is primarily relevant as we prepare today's children and tomorrow's professions with lecturers of the past. From both sides, the willingness to accept new instruments will shape our future.

6

## 7 Scientific tools' and methods' advancements are noticeable, with promising automatisations being implemented

Scientific methods are continuously improved, and we can underline software and hardware solutions that enhance ethical research and enable big data extrapolations.

## Systemic security is becoming a core element of digitalised realms

Maintaining users' safety across networks in a disruptive environment filled with emerging threats is a major concern of cyberspaces and fail-safe measures must be cyclically implemented to maintain collective security.

8

## 9 We pay more attention to a new potential crisis, but these memories are short-lived

We should increase our preparedness in the face of prospective crises. The COVID-19 pandemic proved to us what non-human agents can do. As such, future avenues are taunted by high uncertainty, with numerous rifts in our daily environments coming up. From climate change and food or water distribution shortages, all the way to social unrest or armed conflicts, any of the emerging risks could spiral into catastrophic events and alter entire societies, for better or worse.



# 3. Future Scenarios and Policy Recommendations

## 1. The ones and the zeros Probable scenario



*In the probable scenario, the way we learn will be understood more than today, although scientific progress will not provide all answers to the ways in which we learn. Teaching approaches in a digital environment will include more traditional features and more traditional (non-student-centric) approaches, with only some lecturers being proactive in applying the more advanced methods while teaching.*

In this scenario, human interactions in classes still remain essential, and educational institutions are seen not only as a way of gaining knowledge but also as a very important element in career development in terms of networking and building human relationships. In the probable scenario, technological progress will be evident, but it will not be used to a large extent in the higher education process.

This scenario also envisions that most people will have access to technology and infrastructure, but some students and educators will still not be able to use fast internet or possess advanced technologies at home, all while existing disparities will remain between individuals, institutions, regions, or states across the Danube Region.

Science will make progress in small steps, with more open-source software solutions being used, but most of the data will still be manipulated manually, be it in terms of creation, analysis, or interpretation, by the end users. Safety and security will be improved, but companies and individuals will be exposed to various risks, creating an unsafe environment for learning and science in a digital era. Some minor crises will cause temporary interruptions/slowdowns, but this will only have a minor effect on the general progress recorded.

The envisioned future in terms of digital learning and science does not deviate much from the current state, but some actions should be taken if we want to stay on this track, especially in the context of the Danube Region with different levels of development.

## **Actions to take:**

Improve students' ability to use knowledge in everyday life situations, following the results of ongoing evaluations and testing.

Continue ongoing efforts to remove barriers and increase the accessibility of educational content by the continuation of technological development, diversification of teaching delivery channels, and removal of various forms of discrimination.

## **Actions to avoid:**

We should avoid curriculum revisions across the Danube Region that ignore evidence-based decision-making processes. If left unaddressed, the learning experience will not be adjusted to the needs of new generations, and the role of higher education could be jeopardised.

Downplay the importance of misinformation. The importance people give to misinformation and other non-relevant sources could jeopardise the progress science is making and the way the education system is perceived nowadays.

Turn a blind eye to a new potential crisis. We should not ignore the possibility of a new crisis. As such, we should prepare the infrastructure for possible new lockdowns to ensure easier and more efficient temporary 'switches' to the digital environment.

Minor curriculum revisions. Revise and adapt the curriculum to address issues regarding what and how we learn, with a special focus on the problems and issues already identified by the ongoing evaluations. Curriculum revisions should also address how students can become more comfortable with digital content by gaining intermediate digital skills, but also adjust teaching content, methods, and assessment to the needs of different generations

### **Policy recommendations**

Better integrate existing behavioral aspects of learning and teaching into the educational process by allowing the universities to experiment with the optimal combination of in-class and online classes, and by making improvements in both ways of teaching: ('1') online lectures should allow some students and vulnerable groups to access recorded lectures whenever they want, and ('0') in-class lectures should increase socialisation and networking aspects of the learning process.

Keep technology development at least at the current pace of development. Invest in technology (such as 5G and 6G) across the Danube Region to make learning and research possible in times of new lockdowns. This will not eliminate, but it will reduce the technological gap across the Danube Region.



## 2. From the digital realm, with love

### • Possible scenario

*There is an overlap between the possible and preferable scenarios, as an ideal educational system is less likely to happen in the future. The educational system, being a system, is quite rigid and in a way it has to be rigid enough to provide stability, consistency, and enough time to generate outcomes, but, at the same time, it is always falling behind the dynamic evolution of society. We prepare today's children and tomorrow's professionals with teachers of the past (a majority of which have been prepared in non-digitised systems or are even themselves non-digitised).*



Therefore, for the possible scenario we propose the following path: the current issues so far underlined across the education sector will not have changed dramatically by 2040. Access to education will be improved in 2040, and all of us will have equitable access to education, but access to high-quality education will still be limited. This scenario envisions the transitional period to a more digitised education, i.e. transition of teaching in traditional learning environments to a more interactive and adapted teaching style for the hybrid and technologically mediated learning environment (e.g., micro-learning, machine learning, chatbots, virtual assistants, augmented and virtual realities, etc.).

Also, this scenario challenges formative and summative assessment because of the potential misuse of sophisticated technologies, but it also creates pressure for improving mental health and student well-being due to the extensive use of technological tools. Social learning (learning from others) will be replaced by learning mediated by tools and technology, which is a working model, but it will not be very well-designed; the impact and the implication of that new type of interaction would not be fully understood, researched, and would be difficult to measure.

The number of remote and distance online providers will grow, there will be a bigger demand for those types of learning programmes, and they will develop extensively.

The costs of such an educational programme will decrease. Still, learning mediated and facilitated in the physical environment by human interaction (teacher, peers) will become less frequent, yet of good quality and very expensive. Science and higher education will experience a reduction in quality in favour of quantity. There might be a scientific crisis on what to do with all the immense scientific data available, how to organise it, and how to define relevant research questions for the purpose of identification of significant pathways to do science and deliver further progress of scientific methods in order to improve life quality.

## **Actions to take:**

Massive digitalisation of educational content (through diverse formats), as well as technology and digital development to ensure access to education for all students.

Invest in teacher education to provide teachers with better knowledge and practical skills for use in the digital realm.

Identify incentive systems to promote the teaching profession and attract highly-competitive teaching professionals.



For the purpose of rethinking the teaching philosophy and methods, ensure a democratic, inclusive, diverse environment for education. Teachers and learners should be more engaged in the design and implementation of programme studies.

Create transnational groups of various field experts from the Danube Region (pedagogies, psychologists, sociologists, teachers, labour market representatives, student representatives, and futurologists) to assess and adapt the curriculum for a better learning experience in a new digital realm.

Students should have well-designed services for mental health support to address some challenges of a new digital realm.



# Actions to avoid:

We should not underfund education and fail to provide adequate teacher training programmes, especially in the domain of digital skills. The support programme should be specially designed for an older generation of professors.

We should not ignore the importance of flexibility when designing and adapting teaching philosophies and methods for the new generation of students.

We should not ignore digitalisation or misuse it in the learning and teaching process.

In order to achieve teacher training and professional development, actors are advised to encourage and facilitate capacity-building initiatives that aim for professional development and life-learning opportunities for teachers and students.

Develop, implement, monitor, and revise national and regional (Danube Region) standards of teaching practice. Some common guidelines (or minimum standards) should be developed to guide professors of the Danube Region in becoming the teachers of a new digital realm.

A qualitative and competitive training system for teachers should be designed, as well as improvements regarding teaching competencies, leadership, and entrepreneurial skills of teachers and educational institutional leaders, and other educational staff to be able to engage and motivate learners. By investing in teacher education, we expect that teachers will efficiently use the technology to connect with the learners in the new digital realm.

Create more sophisticated pedagogical digital tools that teachers can use to interact with students.

## Policy recommendations

Develop and implement educational actions towards the safe consumption of online educational content and promote (self-)responsibility in the online environment, as required by the new digital realm.

Integrate educational content and structure it from an interdisciplinary perspective to ensure an inclusive curriculum across the Danube Region that will facilitate learning mobilities and exchange programmes. The curriculum should actively promote the development of key-competences (creativity, digital skills, innovation, teamwork, communication, problem-solving, flexibility, and adaptation capabilities)

Support the creation of services at universities that will offer “mental health” support.

### 3. Enhanced Symbiosis

Preferable scenario

*The preferable scenario, enhanced symbiosis as we call it, will allow (easier) accessibility to affordable and personalised learning opportunities for everyone through the implementation of new technological and digital advancements. COVID-19 has introduced many new teaching/learning methods and opportunities that, if combined with previous practices, will give us a great middle-ground for everyone to benefit from.*



It will re-envision the spaces where learning takes place - in and outside of institutions. Digital and onsite learning environments will complement each other, as they will coexist in a rather harmonious state. Students and professors will prefer different environments based on their personalised needs and capacities. While many schools in the Danube Region lag behind when it comes to conforming to everyone's varying needs, here schools will be responsible to all – those with special needs, different learning styles, and beyond. In this scenario, teaching will mainly be active and interactive, with technology combined with learning methods while retaining practical, specialised, or assessment matters on a face-to-face level.

As a result, there will be enhanced digitalisation of older methods and digitalisation of partial processes – administrative, anti-plagiarism, accessibility, etc. In terms of physical accessibility, there will be uniform infrastructure and solutions; instead of changing the whole design of buildings, students/professors can now attend lectures in a way that best fits their needs, and thus have equal opportunities among themselves. Accordingly, there will be a decrease in costs pertaining to physical buildings. This preferable scenario emphasises the fact that the future of education belongs to students, professors, and the technology that will guide them throughout the process.

As new technology-based education trends such as data use, personalised learning, and redesigned learning spaces become a part of the future of education, everyone needs to stay updated on technology use in order to use it in the most effective way. The roles students and professors play in a learning process will be enhanced in a way that students are more engaged and more active in co-creating the education content with their professors. Both students and professors are more receptive to new (digital) practices.



# Actions to take:

Massive digitalisation of educational content (through diverse formats), as well as technology and digital development to ensure access to education for all students.

Stimulate/boost teachers' creativity and skills to be able to create interactive content and the digital skills of teachers regarding the use of virtual classroom features (shared documents, interactive materials, etc.), computer skills needed for the development of teaching materials and doing science, creativity skills, problem-solving skills, and the use of technology in education.

Make technology reliable and secure to protect students' and teachers' privacy, so everyone feels safe participating in an online environment.

Simplify existing software solutions to make students and professors more willing to accept and use new technologies and software solutions.

The use of in-class, online, and hybrid classes should be optimised; allowing students and teachers to be more flexible in the educational process. Online and hybrid lectures should allow all students and vulnerable groups to access recorded lectures whenever they want.

# Actions to avoid:

Disregarding students' and professors' beliefs towards technology and their varying needs.

Dismissing extracurricular activities and courses where students connect beyond the professional level.

Curriculum reform should include practical technical classes for both professors and students so they can use their resources to their advantage (ICT and Teaching, English Language Learning, etc.), but also courses that address issues of safe internet browsing. Course catalogues should include stand-alone courses (computer skills, the use of statistics, the use of virtual classrooms, etc.), but also every course taught at all levels of education should be helping students gain various skills.

## Policy recommendations

Promote rigorous standards regarding digital security issues, to ensure students and professors feel safe in an online environment. This will allow the online environment to be broadly used.

Invest in and promote the development of more advanced and 'smart' tools for research that will help researchers produce scientific articles with some automatization of processes, such as interpretation of results and assumptions check.

Smart investment in technology to ensure adequate (innovative) tools in the learning process.

# 4.I, Robot

## Wild card 1

*In this scenario, we assume that AI and its subsequent developments will be fully ingrained into all aspects of learning, teaching, and researching. Additionally, human behaviours will be entirely explored, enabling the creation of perfectly tailorable experiences.*



Furthermore, autonomous knowledge-driven and information-based exchanges mean that beneficiary-centred, highly dynamic and interactive approaches form the educational basis, with specialised, self-managed, and adaptive software providing content respective to end-users' needs and market-oriented trends.

Nevertheless, regardless of how individuals' uniqueness is fully accounted across educational pathways, complete universalisation of both techniques and tools will be present at a systemic level through public-private partnerships, so as to enable optimised, accessible, cross-compatible, shareable, scalable, and interchangeable processes. Also, everyone involved benefits from limitless, borderless, real-time, crowd-oriented intelligence, driven by modular courses, institutional juxtapositions, uniformised offerings, etc.

Moreover, full automation, adoption, adaptation, and integration of technologies blur societies' lines, providing immersive routes focussed on enhanced spatial construction, synchronicity, transposition and transcendence, enclosed networks, bio-engineered improvements, adaptive systems, projection, Web 5.0 and IoT, the merger of a digital fingerprint with real identities, newly build university cities and scientific clusters, by way of example.

Thus, as technological accessibility reaches new peaks, based on equally distributed high-fidelity infrastructure coverage and synchronised architectures, fostered by Industry 5.0, allowing for real-time instantaneous big-data creation, manipulation and indexation, elimination of human-overviewed input/output prerequisites, evolved functionalities and processing capabilities, quasi-controlled software agency and autonomy, etc., the research accuracy, prognosis capacity, and co-creative capabilities are enhanced.



Since this scenario represents one of humans' first knowledge migration steps toward multidimensional omni-directional spaces, science and education leap forward with fast-tracked informational exchanges. Also, as institutional boundaries are eroded, decisional vectors shift towards shared power assemblages and communal management, formed through the mixing of technological oversight recommendations and collaborative, participatory, democratic decision-making.

Furthermore, through regulatory measures, safety and security are enhanced across all educational ecosystems. Due to this fact, the scenario, even if never fully implemented, proves to be a stepping stone in terms of what a digital overtake of education looks like, especially in the face of major perturbatory factors. Moreover, as technologies and digital advancements are ingrained in our daily lives, or even encompassed directly into the latter, the reality is subjectivised, as we move towards the transcendence and instrumentalisation of electronic realms, while the complete merger is a commonality, with a completely renewed educational and scientific *modus operandi*.

## **Actions to take:**

Apprehend the ways in which human cognitive processes work, especially long-term learning.

Create and implement regulatory frameworks to ensure regional uniformisation and standardisation.

Conceptualise and operationalise normative formats for both the digital and technological realms.

Massive digitalisation of educational content (through diverse formats), as well as technology and digital development to ensure access to education for all students.

Realise a public-private symbiosis, as to sustain the innovation, alongside an equalised and fast-streamed implementation of digital and technological solutions.

De-institutionalise and decentralise educational and scientific systems to enhance cross-compatibility and participatory decision-making for end-users.

Harmonise and sustain large-scale implementation of cooperative infrastructural and architectural projects.

Redesign learning patterns towards user-driven experiences, tailorable to needs and market trends.

Open-source and crowd-source information flows, so as to create unbarriered collective intelligence.

Increase cyber security functions and safety enforcement measures.

Gamify tasks and cyclically measure performance to foster healthy competition and boost the attractiveness of tasks.

Create specially-designed university cities or areas and cluster scientific research.

## **Actions to avoid:**

The expansion of discrepancies at regional, national, local, and individual levels.

Excessive clustering or monopolisation of the market.

Leaving technology and digital realms completely unregulated or overregulating them.

Low digital literacy and non-adaptiveness of educational actors.

Increase or maintain present administrative and institutional boundaries.

Continue seeking collective and time-based educational processes.

Overexpand and stretch too thin the institutional capabilities by molding or ingraining these advancements into already existing infrastructures.

Generate multilateral and cross-border structures entasked with uniformisation and standardisation of all regional educational or scientific processes, regardless of the institutional particularities or specificities (e.g. modular courses, identical curriculums, complete translation of courses, capacity to switch and follow learning paths across multiple organisations, synchronisation of timeframes, etc.).

Sustain, by capital and non-capital measures, programmes researching cognitive processes and pioneer scientific clusters on them

## **Policy recommendations**

Merge public-private endeavors into large conglomerate frameworks, encompassing all relevant actors, with high budgetary allocations (e.g. subsidised research, nationalised firms, equal distribution, fast adoption, simplified implementation, etc.).

Create multinational norms aimed at regulating the digital and technological realms, including the private sector and end-users, to ascertain decentralised control over the network and its flows (e.g. ethical A.I. development, anti-monopoly practices, price caps, unpatented solutions, regulated bio-engineering practices, etc.).



Conceptualise and create entirely new university cities, specially designed for the maximisation of the educational output, outside of already existing areas, by relocating institutions there and clustering research institutions alongside market actors.

Regulate informational flows to enable complete open-source and crowd-sourced access to all of the data available with the reinforcement of permanent updates.

Eliminate discrepancies by investing in infrastructural and architectural harmonisation across the Danube Region (e.g. uniformised prices and accessibility, complete coverage, multi-platform solutions, cross-system functionality, universalised solutions etc.).

## Policy recommendations

Redesign all the educational procedures, especially monitorisation and assessment, so as to enable a personalised educational environment (e.g. self-exploratory, individualised timeframes, gamified competitiveness, adjustable performance etc.).

Redesign all the educational procedures, especially monitorisation and assessment, so as to enable a personalised educational environment (e.g. self-exploratory, individualised timeframes, gamified competitiveness, adjustable performance etc.).

## 5. Back to the Future

### Wild card 2

*Back to the Future, a scenario named after a 1980s sci-fi classic, explains a situation where we have to go back in time and adapt to the “old ways” of teaching and doing science. The probable cause for this scenario is related to unforeseeable catastrophic events, in the likes of dramatic and sudden climate changes, food crises, new armed conflicts, extra-terrestrial risks, and the list can go on.*

These unexpected events might well influence learning and science in the future, resulting in many issues that this version of the future should try to address: lower adoption/availability of technology; limited access to internet/technology/communication; the lack of resources for technology development and survival; the shift in societal values (traditional approaches to teaching and learning are more preferred than modern; lowered importance of formal educational methods), chain disruption, etc.

This scenario is envisioned as not desirable, as its primary reason to appear is unforeseeable catastrophic events that will require us to go back to the “old ways” of teaching and doing science. In order to prevent this scenario from happening, several actions should be taken:

Develop wider sets of action plans to be better prepared for the “Black Swan” risks and other possible catastrophic events. These action plans should prescribe in detail what to undertake regarding education processes in case of such events

Promote the role of individual action in preventing catastrophic events. Individuals should fully understand that every action undertaken by them regarding the reduction of negative human activities is valuable. This philosophy should also be integrated into all curriculums, promoting ways to take individual responsibility

Change the way we learn about environmental issues to raise awareness of climate change and the need to act now and integrate environmental issues in all courses, regardless of the fields of study.

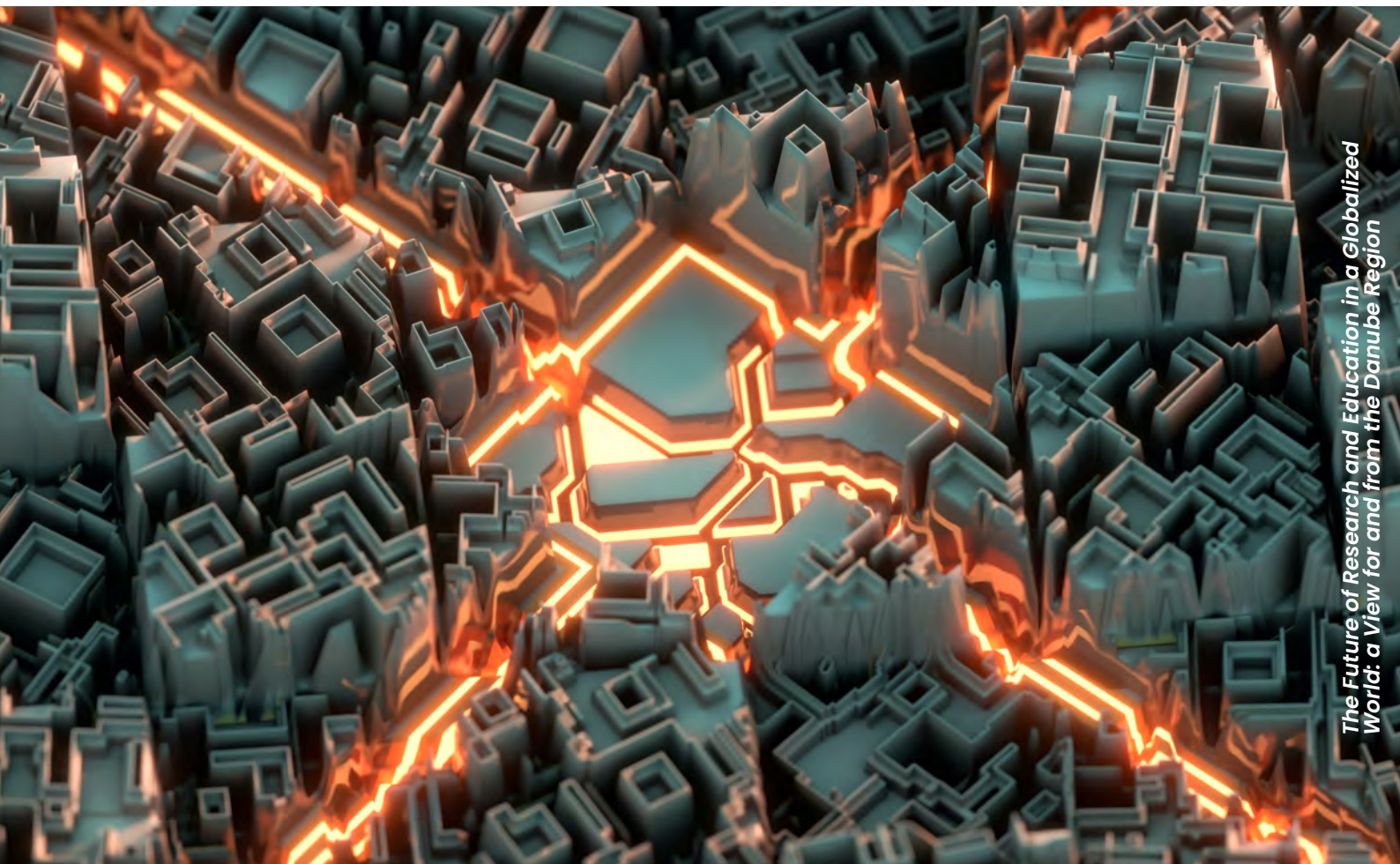
More policy measures across the Danube Region should consider various climate mitigation strategies to reach a net-zero carbon economy (such as clean energy, climate-smart infrastructure, etc.). These strategies should be taught more frequently in higher education institutions to get students familiar with the possible approaches to address these pressing environmental issues.

## Policy recommendations

Build flexible education infrastructure that can easily be modified to also suit non-high-technology intensive teaching and learning solutions.

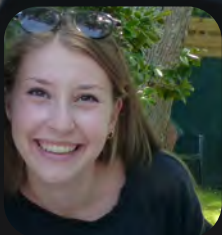
Curricula development to address the issues of changing climate in more concrete ways. All students should be aware that their individual actions matter, and that everyone can contribute to sustainability by changing their everyday habits.

Create adequate plans and prepare the infrastructure to act in case of the most common catastrophic events happening (climate adaptation).





# Scientific Research European Decade



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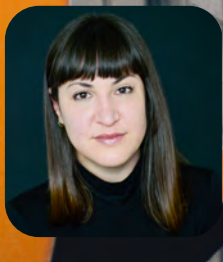
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# Research for Decision-Making



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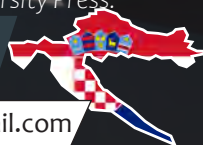
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*Dear Readers, for now, we know that the future looks bleak and unpromising. Disguised by the economic freedoms and commodification of all societal relations, vast cross-country divides stemming from pre-existing differences in capital, wealth, and income continued to exert a major challenge with scientific research at the root cause of the problem. We would love to achieve prosperity, balanced growth, harmonised development, and convergence in the Danube Region by ensuring the scientific research for European decision-making embodies the European values which were used to integrate the countries in the first place. In crises there are opportunities to change and, in this case, achieve prosperity, balanced growth, harmonised development, and convergence by ensuring that the scientific research for European decision-making renders European values which were used to integrate the countries in the first place. This journey will not end by the year 2040. Our message is simple. We ask you to set aside your preconceptions and see change as an opportunity.*

# 1. Introduction

Since the end of World War 2, the alterations of the socio-economic landscape brought about historically unprecedented peace and economic advancement throughout Europe. In light of this, the scientific research rendered foundations upon which betterment could materialise through fostering efficiency, developing a welfare state, and increasing the standard of living and life expectancy. This resulted in unity among European nation-states based on international solidarity, guaranteed shared prosperity, and harmonised development.

However, in spite of this, the supranational institutionalisation of the four freedoms and single market integration brought about skewed distribution of benefits among Member States. The experience of the past two decades demonstrates that much of the former dependency relations has remained. Disguised by the economic freedoms and commodification of all societal relations, vast cross-country divides stemming from pre-existing differences in capital, wealth, and income continued to exert a major challenge with scientific research at the root cause of the problem.

The institutional design based on the free-market unification of heterogeneous countries lacking federal institutions has, instead of equality, cohesion and convergence, led to cross-country stratification. The latter is especially relevant for the Danube Region, whose countries predominantly suffer from the current state of affairs.

Due to the insufficient resources to invest in research and development and state-of-the-art technologies, less-developed European countries lag behind advanced economies. Simultaneously, they cannot utilise the full potential of their citizens' talents and skills and cannot competitively compensate their high-skilled labour, leading to the geographical concentration of talent based on the ability-to-pay principle. The latter implies that the most talented researchers will migrate to countries with the highest wages and focus their efforts on advancing the interests of advanced economies, thus exacerbating the deterioration spiral and bringing the sustainability of the admirable European project into question.

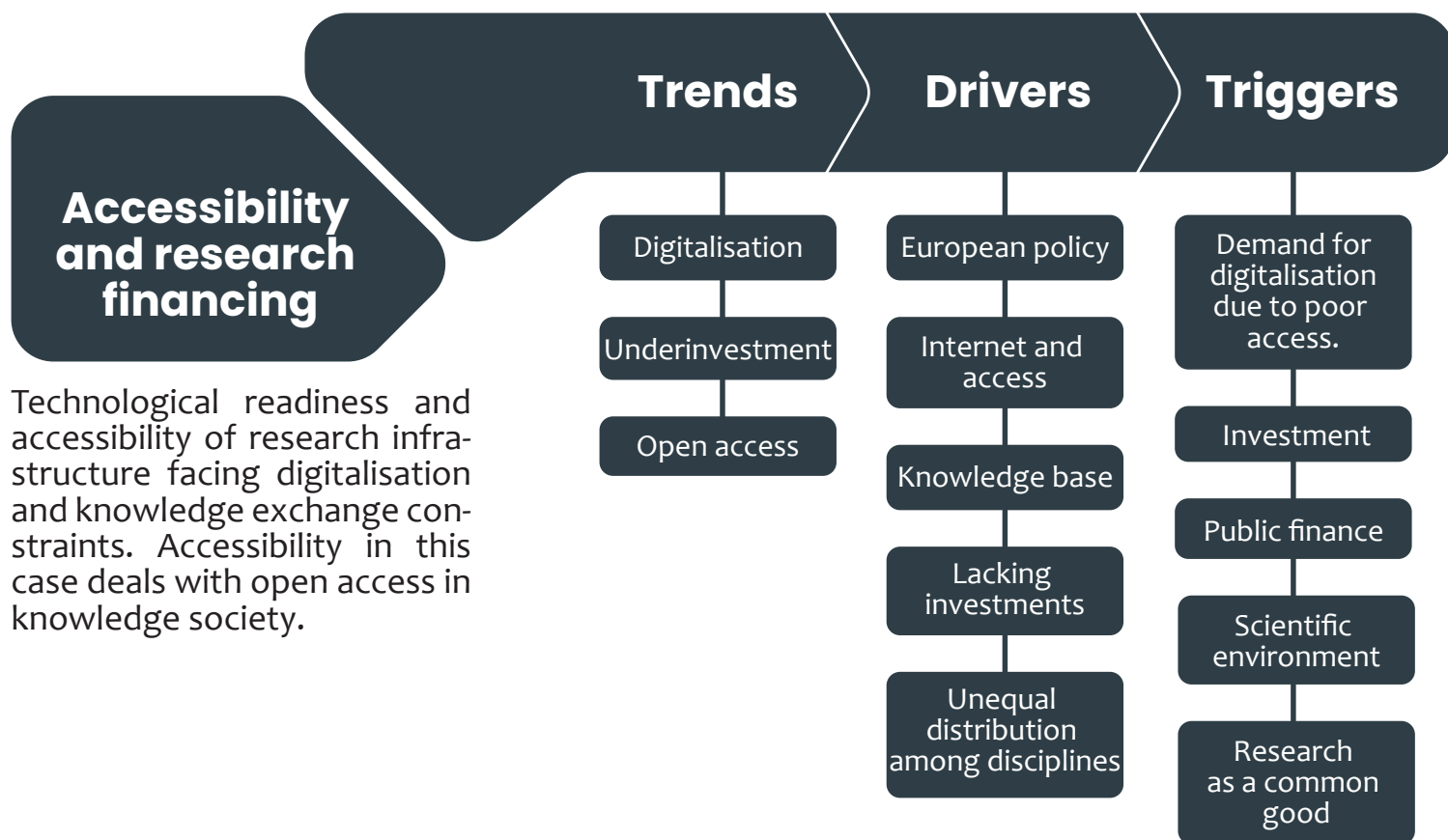
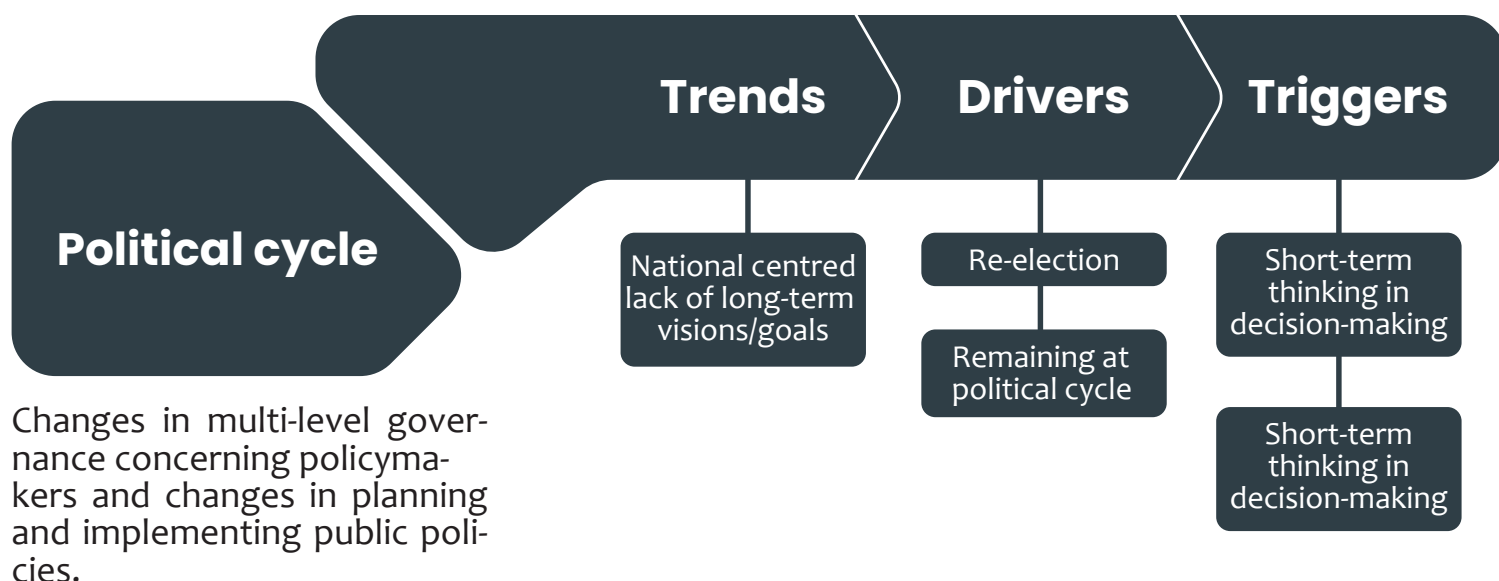


Consequentially, the scientific research for European decision-making showcases the scientific revolution as a principal driver of the increase in wellbeing and an underlining force solidifying the existing cross-country power relations.

With the regional focus in place, this section of the DRC strategic foresight seeks to explore existing megatrends, future scenarios, and policy recommendations necessary to avoid national interests overwhelming supranational inspirations and erasing all the progress done.

Therefore, by abandoning the existing contradictory practices and acknowledging scientific research as the backbone of the present-day mode of production, European decision-making must evolve to being the generator of symbiotic and synergic partnerships, ensuring the prosperity of all European citizens.

## 2. Horizon scanning and megatrend analysis





## Science management & communication

Science management & communication concerning economic efficiency of research and labour productivity in science (R&D&I outcomes). This challenge reflects the process of managing research from ideas to outcomes (scientists, non-scientists as an HR) science4policy (public).

### Trends

- Growing demand for scientific voices
- Labour productivity
- Economic efficiency
- Fake news
- Public demand for real-time explanations

### Drivers

- Lack of experienced and qualified staff/experts
- Scientific projects
- Internationalisation
- Research outcomes
- Open science

### Triggers

- Pandemic
- Funding
- Strategic development of organisations
- Society
- Quality of life

## Hindering pluralism & academic careers

Hindering pluralism is a challenge concerning a predominant stream in research that is rigid (funding research outputs - papers rather than policy briefs/reports) - pursuing rewards (impact factor journals). Academic careers and their rigidity (inflexible).

### Trends

- Predominant research approaches (one-sided)
- Persisting academic culture (refusal to make any positive change while being rigid)
- Pursuing publications/research outcomes
- Lack of policymaking involvement of academics

### Drivers

- Funding and hindering a competition
- Geopolitical influence
- Research with limited impact
- University funding

### Triggers

- A system which rewards individualism and doesn't reward collectivism
- Talent at profitable activities
- Incentives (financial & nonfinancial)

## Revolving door policy & conflicting interests causing wicked problem

Links between R&D and industry, especially when it comes to the evaluation process and experiences gained from this aspect (the use of expertise in industry) - divergence from equality in the case of access to knowledge and expertise (favouring organisations with experts from the policy implementation and evaluation background).

### Trends

Links between policymaking and industry

After completing their position, the researchers designing policy decisions and rulebooks often fill in high-level appointments in the industries they intend to regulate in the first place.

Existing power relations

Historical development

### Drivers

Personal gain

Biases in decision-making

Unequal distribution of capital among regions

Path-dependency buildup

### Triggers

Strategic development of organisations

Focus on effects rather than cause

## 3. Scenario developing

### 1. "Business as usual" Probable scenario

*A probable scenario would be the EU continuing with their ongoing policy regarding the role of scientific research in decision-making. The already existing East-West divide would not be narrowed significantly; voices from the western part of the EU would dominate the process and discourse in the context of research and policymaking.*

A probable scenario would be the EU continuing with their ongoing policy regarding the role of scientific research in decision-making. The already existing East-West divide would not be narrowed significantly; voices from the western part of the EU would dominate the process and discourse in the context of research and policymaking.

Scholars from the eastern part, including the Danube Region, would play a less significant role, as funding would be mainly given to universities and researchers from the West and/or big players in the field.

Also, depending on the Member State, scientific research has a different impact on decision-making which leads to disagreement within the European Union and its institutions, when it comes to the role scientific research should play in the decision-making process.



This scenario includes an ongoing inequality within the European Union in terms of financing research as well as using results for policymaking, although there might be small steps towards more equality.

However, these remain mostly unsuccessful due to complicated processes and the fact that development only happens very slowly. Additionally, the already existing disagreements between the European institutions and some Member States (Hungary, Poland) would continue but the status quo remains.

## 2. Cowboys vs Cosmonauts

### Possible scenario

*Russia will hold Ukraine for a longer period, creating a new cold war situation. This means that not just a geopolitical tension, but an ideological clash between these countries. The EU and Danube Region become more cooperative with each other. National interest decreases, as collective action is more preferred.*

As the last Cold War triggered shifts in society (human and women's rights, sexual liberation) and some others through the COVID-19 Pandemic, in the coming decades there will be an ideological shift opposing those ideologies which are connected to Russia/Putin. Marxist thought and the redistribution of wealth become more urgent for a broader society.

EU politics and politicians as well as society will be more drawn to socialist-green ideology, countering the fascist tendencies Europe wide. The EU and the Schengen states realise after a couple of years that they have to develop not just fast solutions for more sustainable energy sources but also a way to feed Europe.

Through this development the agricultural industry comes more into focus in the Danube Region and with it comes a need for new ways of agricultural production, where universities of the region could step in. Bureaucratic communication at the state and EU level must be reformed and become less difficult.

Universities and research will be less funded in general. In addition, the results of many studies are levelled. Such important issues as sustainable development, resource-efficient economy, and synchronisation of the EU Green Deal will not have an effect, due to significant “military pollution” in the EU.

More attention will be paid to military education and research, both military and security. The need to increase funding for the security sector will directly reduce the development of funding for social and cultural research.

Given the economic situation and decline in childbirth, universities and Europe's attitude against refugees, we have to think through and abandon “market-based” financing. Additionally, ending cooperation with countries who back Russia's war against Ukraine as it is considered as unethical and questioning their influence on academic life.



## 3. Building Bridges

Preferable scenario

*A preferable scenario is based on building bridges between scientific research and multi-level governance in the EU (intersection of academics and policymakers), and on systematic collaboration in the Danube Region (knowledge transfer from the Danube Region towards EU policymaking).*

Building bridges between stakeholders provides a basis for evidence-based solutions to address challenges (e.g. climate change, sustainability, globalisation). This scenario reflects long-term dialogue between the scientific sector and policymakers and vice-versa, with state-of-the-art collaboration procedures (responsible research and innovation).



Responsible research and innovation in decision-making respects the demands of policymakers in terms of planning and implementation of public policies/programmes, and acknowledges scientific outcomes in terms of policy briefs/reports/case studies (translating complex policy briefs to evidence-based policymaking).

This preferable scenario underlines the development of research clusters (international consortia) that focus their resources to collaborate within the EU on topics needed for European policymaking and disseminate the outcomes within well-established network of scientists and policymakers. This leads to more equality among researchers from different countries by pursuing inclusion. We foresee progress in European education, health care and security.

Building bridges allow the establishment and sustaining of smart bureaucracy that allows for changes in communicating scientific outcomes (scientific voice of the Danube Region in policymaking), and it benefits processes of translating complex policy briefs into more informed and efficient decision-making.

### 3. Genesis Pax Europe Airbag Scenario Wild card

*Brought forth by the ongoing global challenges imposed by the development of the means of production and dictated by globalisation trends, the alliance of the European states undergoes fundamental alterations in its institutional design.*

The geopolitical calamities mandated the solidification and preservation of the wider European socioeconomic circle channelled primarily through the accession of the neutral countries and the expansion encompassing eastern candidate countries.

Simultaneously, ecological and health perils pushed for more robust integration of the federal type. Bounded by the common interest, such a heterogeneous cross-country state of affairs created an environment curbing democratic deficiencies (democratic deficit) and demanding direct participation and equality among all European citizens.

To cater to the globalised convergence in needs and wants, desire for socioeconomic freedoms, an equitable setting and a strong welfare state, policymakers seek refuge in scientific research for European decision-making.

The legitimisation of such a novel mode of governance exploits technological advancements, big-data collection, and artificial intelligence to provide evidence-based solutions preventing discrimination on all fronts.



The technological revolution enables instantaneous data gathering and analysis to furnish a platform for optimal outcomes, with welfare functions derived directly from citizens' active participation. Based on the choice architecture and subsidiarity, the researchers from diverse backgrounds enhance the role of science in the decision-making processes and retain citizens' sovereignty through nudging individuals.

Such a decentralised system of science-driven management of public matters, coupled with the tripartite government system, facilitates utility maximisation and an orderly scenario without causing a loss of freedoms, identity and values, efficiency, equality, growth, and welfare.

## **4. Visioning (Forecasting) and Backcasting**

### **1. “Business as usual”** Probable scenario

In order to achieve the probable scenario and guarantee a “business as usual” situation, reforms at several levels, like multi-level governance, should be clearly avoided, as this would lead to a change in the situation. Minor reforms would be fine, as long as they do not over-regulate and hamper freedom, innovation and incentives.

### **2. Cowboys vs Cosmonauts** Possible scenario

In this scenario the Danube Region cannot avoid regional focus due to funding cuts. Cooperation between the region's universities and research institutes will be key to ensure the diversity of academic disciplines, perhaps similar to the V4. This can be done through better mobility, integrating smart-bureaucracy, by open enrollment and hiring for refugees and non-EU nationals in all countries (consistent principles).

Any disintegration within the EU should be avoided. Universities should in this sense cooperate more with the state to ensure this. Concentrating funding just on military-based research and later widening it only to agricultural and sustainable energy resources without taking measures to foster economic benefits for other disciplines must be avoided.

Developing products whose patents the “university owns” to finance less-funded disciplines in the short term will make education better (more stuff teaching and administration). In the long term, it will have educated creative individuals who are more capable of adapting to a fast-changing world.

For fast-adapting academics the EU and Danube Region should change the country/EU focus in the curriculum towards a diverse representation, which will allow academics to learn to switch and think in different kinds of systemic thinking. Leaving university funding based on student numbers will also leave universities with less capital, which has to be reformed too.

### **3. Building Bridges** Preferable scenario

In order to achieve the third scenario, the EU should implement reforms to increase inclusion, diversity and better communication in science. An important point would be the development and introduction of a joint platform for collaborations in politics and science to foster open science and open access research. To represent the interests of the Danube Region there should be amended legislation on the possibility of remote research employment of researchers on projects in order to overcome barriers between Western and Eastern Europe. In addition, the criteria for academic research promotion may be redefined.

Steps to avoid would include tolerating existing structures of corruption and nepotism as well as other forms of favouritism, especially when it comes to the allocation of grants as this would contradict the strive for more equality between the western and eastern states of the European Union. Complicated bureaucratic processes as well as short-sighted policymaking should also be avoided. Another problem that should not occur is the overproduction of scientific research as the consequences would lead to lesser attention for scientific work or decrease its value.



# 4. Genesis Pax Europe - Airbag Scenario

## Wild card

In this scenario technology should be used in order to form the desired future. As a first step, open access to education and scientific research as well as transparent data-gathering have to serve as a precondition. For full utilisation of talent and synergic cooperation between universities, European decision-makers and the public, strengthening the idea of diverse European cross-country identity through accessible and timely dissemination of all relevant information and inclusion of public opinion is important.

Fostering inner-group, cross-country cohesion, equality, harmonised economic growth, and equitable geographical distribution of socioeconomic benefits based on evidence-based research recommendations is also a step the EU must take.

Another idea for a future EU would be the expansion of common goods (which include education and digital literacy, health care systems, and military, among others), and commonisation of the debt, based on evidence-based research advocating justifying solidarity-driven European project. This would benefit the creation of a central European government advocating for smart specialization, harmonization of taxation, and restriction in using cross-country competitiveness at the expense of other countries, creating a new European Dream.

In order to make that happen, conflict and disintegration based on the deterioration of the fragile trust in authority of the independent scientific research over the European decision-making should be avoided. Even though technology will play a very important role for the future of decision making a social credit system and technological suspense (as e.g. in the People's Republic of China) should be shunned, as this would lead to a European form of surveillance capitalism and tech-totalitarianism. In addition, limitation of the foreign exposure to resource and investments dependency on extra-EU parties and crucial infrastructural dependency regarding the platform enabling research-based transformation of European society would not be useful.

## 5. Policy Recommendation for Scenarios

### 1. Business as usual

**1** | Keep the current state of European integration and do not allow other countries to join as this would only cause instability and foster changes in different possible directions.

Only allow minor reforms and changes when it comes to educational, as well as economic and social policy in order to keep the status quo. **2**

**3** | Due to disagreements within the Danube Region countries, do not pursue a unification of the educational system.

Keep the current processes for universities and researchers to apply for funding for scientific work. **4**

**5** | Develop opportunities for remote work of scientists on common topics and projects.

## 2. Cowboys vs Cosmonauts

**1** | The establishment of interdisciplinary research institutions that are either based on future scenarios or work with material scarcity. In wealthier regions, the first model could be established, and where resources are scarce, the second model could be used to invest available funding in job security and scientific exchange.

Integrate science communication courses and further education in science communication to improve bridges between policymakers, society and scientists. These measures could close the gaps not just between those with and without academic training but make inter- and transdisciplinary communication between academic disciplines more effective.

**2**

**3** | For fast adapting academics the EU and Danube Region should change the country/EU focus in the curriculum to allow a diverse representation, which will allow academics to switch and think in different kinds of systemic thinking and be a base for a better intercultural understanding. These should also be encouraged by exchange programmes between universities, better mobility, integrating smart-bureaucracy, open enrollment and by hiring for refugees and non-EU nationals in all countries (consistent principles).

Ensure funding for all varieties of disciplines through patented products of more founded disciplines, for example military, agriculture and sustainable energy research. Patents should be owned by the universities and ensure that this capital will be invested in education and research.

**4**

**5** | University funding based on student numbers should be eliminated as the declining population will not keep up with existing enrollment. To understand better what new indicators there could be, expert groups have to be formed to determine the best solution for the coming decades.

## 3. Building Bridges

**1** | To start and maintain a platform for knowledge sharing between academia and public authorities (academia to policymakers and vice-versa); promoting the use of research outcomes (case studies/white papers/policy briefs) in policy planning, implementation, and evaluation. Danube Region practice and policy forum/events/projects should be based on “bridge building” to meet the needs of academics to pursue research outcomes and policymakers to have more informed decision-making. This platform should reflect on outcomes that are “digestible” to decision-makers (making it easier to understand the benefits and implement it in practice).



To promote more inclusion in R&D&I when it comes to public policies; supporting international think tanks of researchers (early career and senior) in the Danube Region. This recommendation is based on linking transdisciplinary expertise coming from the Danube Region and supporting remote working (remote transdisciplinary teams from the Danube Region) to make academic/research careers more attractive/flexible to maintain these think tanks.

2

3

To start and maintain a platform for knowledge sharing between academia and public authorities (academia to policymakers and vice-versa); promoting the use of research outcomes (case studies/white papers/policy briefs) in policy planning, implementation, and evaluation. Danube Region practice and policy forum/events/projects should be based on “bridge building” to meet the needs of academics to pursue research outcomes and policymakers to have more informed decision-making. This platform should reflect on outcomes that are “digestible” to decision-makers (making it easier to understand the benefits and implement it in practice).

Proceed with initiatives of Open Science to disseminate scientific outcomes in the Danube Region (showcasing outcomes of joint activities) to raise awareness of scientific outcomes and their transferability to member countries in the Danube Region to advance Knowledge Society (sharing outcomes with wider audience). Open research evaluation is recommended to have transparency in terms of evaluating research to avoid aiming simply for “high impact” (research 4 research) in the Danube Region. Evaluation should reflect on the use of outcomes and their transferability into practice addressing local, regional, national and European stakeholders (rather than research 2 research). This recommendation also entails changes to university financing based on research outcomes to some extent and complements subsidising based on the social and economic impact of projects/studies/activities, representing a third role of universities in the Danube Region.

4

5

Academic careers are recommended to address the lack of academics involved in policymaking by making it more attractive to participate in policy planning, implementation, and evaluation (by modifying criteria and evaluation of R&D in academia with financial and non-financial incentives). Matchmaking in this case should be supported by making research teams of academics contribute to more informed decision-making (skills development programmes for academics) in the Danube Region based on national/regional/local needs and with results transferable to practice.

Establishing and maintaining research clusters (research communities) in the Danube Region to pursue smart specialisation in research concerning transdisciplinary scientific teams (social capital development - skills of scientists), combining early career, mid-stage, and senior researchers (forming think tanks) around the Danube Region, with the aim of strengthening the capacity for quality research (forming teams based on topics related to Responsible Research and Innovation), and support mobility/remote working and long-term cooperation of research organisations with the application sphere (national, regional, European stakeholders).

6

# 3. Airbag Scenario

1

To include high-end technologies in the governance system of the European Union, which incorporate big data collections and artificial intelligence in order to form a technocratic decision mechanism. In addition, it is necessary to implement hybrid methods (expert opinion + analysis of quantitative data) of supporting decision-making regarding the financing of scientific projects for unbiased and better decision-making. This all would lead to a more unitary decision-making process, which could prevent discrimination and unequal treatment.

2

Promoting equal access to education for all as the precondition for inclusive scientific research, enabling the implementation of the European Social Model. Establishing funds for students from poorer backgrounds is vital to foster the benefits of diverse academic research and entrepreneurship. Grant funding should also be made available for entrepreneurship and social-entrepreneurship. Models for funding research institutions that can host PhD students and postdocs should be developed. These institutions should make it possible to alternate teaching and research work in order to ensure the quality of research and teaching.

3

The social architects of the new system, implementing technology, data harvesting, and artificial intelligence in decision-making, must follow the principles of unbiasedness, transparency, and promoting the wellbeing of all European citizens. The panel of interdisciplinary experts must encompass all strata of the European social fabric. In contrast, the institutionalised framework must prevent social hacking and dissemination of manipulative content, prevent concentration and misuse of power, and comply with the ethical standards of surveillance and data gathering. Authorities should put in place publicly accessible records, a system of accountability for individuals violating fundamental rights, and should minimise and disclose risks of harm that those in positions of power can exercise over the general public. The new decision-making system should not abuse the common good and must safeguard against rent-seeking practices. If implemented correctly, the use of novel technologies and artificial intelligence in decision-making can beget evidence-based research outcomes that will reduce regional and cross-country disparities and enhance the lives of European citizens at large.



# Employability and early-sta



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# y for students age researchers



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*It must have been a rough ride to this day, dealing with all the problems we have addressed, yet now you may be dealing with new, more cumbersome ones. Take a moment to appreciate the path you've created, not only for yourselves but for future generations as well. Until next time, try to address and imagine the future in 20 years, tackling your current struggles.*

## 1. Introduction

One of the most critical aspects related to the economy is the sustainability of the financial system, working on a system based on contributions from the people who are actively working, consuming and paying their taxes. Thus, a backbone of the economy is the assurance that the future generations are involved in the circle and will continue to work in the different areas that an economy needs. In this regard, the state must place a great emphasis on the importance of assuring that graduates have the chance to be employed in a field they studied or in another. This does not only limit the actions of the state, which must foster this transfer of students into the labour market, but also the employers who should seek to create opportunities for students.

*Early-stage researchers are also an important part of society, as they represent the future experts in the sciences. Creating opportunities for them, such as the possibility to choose between following an academic career or a professional one, sustaining their activity by financing, or encouraging them to pursue research are key elements for each state to benefit from their expertise.*

The European Union, with its policies on the integration of states and their effects on institutions of higher education and the labour market, had a great impact on the countries which are now part of it. The Bologna Process and the free movement of people have permitted a lot of people to leave their home country and search for better jobs and lives in other countries which offered them more possibilities.

These had a rather negative impact on the conditions for employability of students and early-stage researchers in the Danube Region, where higher education institutions and the labour market had to face new challenges, adding to those coming from the recent past. Rather than leading towards a more integrated approach on the issues of education and employability, some Danube Region countries have been negatively impacted by the changes. As such, brain gain and brain drain processes, rural exodus, flight of human capital and the continuously changing working culture have negatively impacted those states. As a result, the present part analyses the possibilities to fix the issue and to identify the trends of these challenges and the opportunities in the Danube Region in order to solve the issue of employability of students and early-stage researchers. It does so, following the foresight approach and drafting four scenarios on the issue, by starting from both the opportunities and challenges faced by states in this area.

## 2. Megatrends

*In the drafting of the four scenarios below, a megatrend analysis of the current situation was produced by the team. These megatrends are global variables or trends that influence a phenomenon, action or fact in a specific region which determines a social category, in our case students and early-stage researchers, to take action in one direction or another.*

*Regarding our situation, we considered that:*

**1** | The brain drain/gain phenomenon happening in Danube countries is something that affects the thematic area of employability for students and early-stage researchers, as those individuals usually search/find jobs in other developed countries and leave the ones from the mentioned region.

Underemployment is also something of great importance in this thematic area as it forces the mentioned social category to be in search of opportunities in other regions than the Danube Region, thus affecting the market and productivity of a specific country.

**2**

**3** | Lack of development of soft skills by universities is another trend that influences employability as a good majority of the current university curricula are focussed on the development of hard skills, whereas employers are more and more interested in the soft skills of a candidate.

Lack of will of companies to employ freshly graduated students affects this thematic area as employers usually are reticent in hiring students with no experience.

**4**



**5** | Universities try/struggle to provide students with job-related skills. With this trend, universities are in search of the perfect way of acquiring skills for the students and the curricula are in continuous change

Autonomy and diversity can shape education worldwide or regionally. By this, countries could have a specific curriculum by which it adapts to their specific labour market needs. **6**

**7** | European Education Area is another trend which affects the thematic area, as countries, by adopting the Bologna system, implemented a series of directions intended to make the labour market more accessible for each European citizen. This had a direct implication over the employability and brain drain, as many citizens from the Danube Region have emigrated to another country.

### **3. Scenario developing**

## **1. More drops in the ocean** Possible scenario

*Starting with the possible scenario of employability of students and early-stage researchers (ESR), a number of factors will influence this field following the identified trends.*

*Due to limited financial resources, especially in eastern countries of the Danube Region, it will be hard for them to catch up and they will continue to stay behind western countries.*

Despite ongoing slowly increasing streams of investments in different areas of higher education and cooperation with companies and joint efforts, the higher education institutions in the Danube Region, and especially those in the more eastern regions, will not be able to catch up to the western countries. There is no doubt that there will still be social and structural inequalities when comparing countries and within countries themselves.

Still, by creating more equal synergies within society, companies and universities, those inequalities will grow smaller in time and will make equal possibilities to enter the job market more likely. This will of course take more time and by 2040 one will only be able to see this trend's first success. This trend of slow but steady improvement will also be visible in digitalisation and digital preparation. This clear backlog in East European countries will be able to improve and catch up thanks to investments by the government and companies, being interested in ensuring well prepared and qualified future employees. With companies being involved in this process, university courses and departments will focus especially on the digital skills and digital preparation of their students. But still they will stay behind the western parts of the Danube Region, because investments will be limited.

Companies will also be involved in the process of student training and assessment. Through this greater involvement, companies can ensure students they want to hire develop the needed qualifications and soft skills for their later employment and also possibly ensure future suitable employees for their company. With greater corporate involvement in higher education, universities will focus even more on technical careers, increasing competition in the labour market. Even though researchers will continue to emphasise the importance of gender equality and sustainability and provide their expertise in these areas, this will likely not result in policies according to their advice.

Of course, there will be obstacles slowing this process down. Moderate university flexibility as well as only limited available financial investment possibilities in the Danube Region will slow down fast progress. It will take much longer than until 2040 for the eastern Danube Region to make up the backlog in digitalisation and education.

Concerning the opportunities for students and ESR - whether in private, academic or public institutions - the possible trend will continue to show a difference between the countries in the centre of the continent and those in the east. Therefore, the phenomenon of brain drain from the countries of the eastern Danube Region to the western countries will continue and decrease only slowly.



## **What should we do?**

Ensure investments in higher education from the government as well as from private investors, such as companies interested in skilled employees.

Get connected with companies and stress the positive outcome and the benefits they can gain if they are involved in student education and assessment. Following this, they will be more involved in higher education and invest in it.

Invest money and further resources in digitalisation and students' digital education, especially in the eastern Danube Region, to catch up in the international comparison, even though this will likely not happen in this short time frame.



Get decision-makers from different areas (politics, economy, education, etc.) together to create more synergies, working together and stressing the positive outcome that a flourishing education system in the Danube Region would have for everyone. By pointing out the opportunities and benefits for every actor, they are more likely to perform actions accordingly. Especially important would be universities and companies working together.

Continue stressing the importance of gender equality and sustainability more frequently to make sure it is a present topic, even if no actions follow.

## What should we not do?

Cut investments in higher education because this will increase the lagging behind western countries.

Only focus on public investments and forget about private investors, such as companies. They are a key stakeholder when it comes to students' education and preparing them for the labour market. They are able to make big investments and should therefore be targeted.

Not focus on digitalisation and digital education. This will lead to students not being properly prepared for the labour market.

Start a pilot programme focussing on bringing decision-makers from different areas together. This programme should be focussed on developing programmes to work together and ensure companies' involvement in higher education to push digitalisation and digital education in East European countries.

Ensure public funding for the improvement and development of higher education institutions by dedicating at least two percent of countries' annual budgets to it.

Create a fund that spends money only on projects pushing the digitalisation and digital education in East European countries.

### Policy recommendations

Target and address decision-makers – especially female and ecologically interested ones – to win them over as ambassadors for their own cause. This will make politics focus more on the topics of gender equality and sustainability.

Make investments in higher education for companies attractive. Support and fund the involvement of companies in higher educational programmes to kick off investments and illustrate the profits and benefits companies can get from their involvement.



## 2. Hope to despair

### Probable scenario

*In such a difficult time to concentrate on planning one's future, with the informal economy widening the reliance of workers and strong migration fluxes, detecting the movement and the reasons behind students' choices in terms of employability and education is not an easy job. Certainly, students will choose their studies in accordance with their future careers and desired job position focussing on a middle- and long-term vision.*



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As a consequence, it is highly probable that this choice would be swayed by the local and regional socio-political context changing on employability, business, academic and industrial relations and social accessibility. The environment will also impact the ability to overcome micro- and mega-obstacles to accessing research, like demotivating competitiveness, low salaries, incentives to do research abroad, non-transparent positions and overtures by universities. In this case, stability will be sought through the lenses of career plans, which will involve both human and economic calculations during one's educational path.

However, the region has been experiencing an increasing mismatch between the skills companies need and the slow adaptation of university curricula to job market needs, even at the local level.

This means that students and early researchers will be left alone in improving their own situation, aiming at a more resilient and rewarding career prospectus, whereas a substantial and growing gap between theoretical knowledge and practical competence takes time to create convergence and true career development. Universities can do more to reduce this gap but they are unlikely to focus on markets going beyond the structure of academic courses.

More specifically, university administration will commit to building and maintaining partnerships with the private and public sectors, focussing on employment consulting for students. This effort can foster enterprises', local companies', NGOs' and local administration's access to universities' formative and extra-formative programmes.



The presence of external actors in universities will create institutional and personal boundaries, aiming at concretising specific career paths and opportunities in a strong competitive environment. It is highly probable that universities, diverse though they may be, will show moderate flexibility due to both the difficulty of creating such a comprehensive partnership in the local community and the crystallisation of previous academic and knowledge-based projects. Businesses/employers involved in the curriculum design will experience a broad variety of opportunities, but the moderate organisation flexibility of university administration will lead to limited actions resulting in part professional, part academic programmes. The administration will try to keep partners and will try to outreach new enterprises with limited resources.

Indeed, universities will have the intention to implement programmes aiming at various career paths, but the officials of some universities will not implement it. As a matter of fact, universities will merely grant narrow access to opportunities coming from synergies and soft partnerships among actors enhanced by economic and financial instability.



While universities can provide and make visible the preparation for both research/theoretical careers and practical/technical careers, they would probably follow the trend of the job market focussing on hybrid/classical work, causing the return of students and professors to course halls. In this sense, universities are unlikely to be persuaded to set up and make available spaces where listening and fostering students' and early researchers' discussions on academic and psychological needs and ideas.

The digital advance prompted by COVID\_19 regarding sanitary, urban and social conditions will probably be reversed if digitalisation within universities, in terms of programmes and internal organisation, is not invested in.

This large frame addresses an important lack in the current system, which will probably halt progress in Danube Region universities' systems: concertation and horizontal cooperation among early researchers, students (and their related channels of organisation) and university officers and professors. It also highlights a compelling strategy: investing in the future by interpreting and adjusting the market and diverting it from private universities to public infrastructure.

## What should we do?

The current situation highlights the difficulty of making Danube Region universities an asset in fostering social and economic development in the region. However, universities have to see themselves as such important drivers of progress, primarily as key players in connecting municipal, local, regional research, study institutions and early opportunities in the job market.

Universities in the region can and should offer opportunities to their students and researchers to study in the region and trigger stronger cooperation in order to strengthen both research and cooperation among institutions of the region.

Work at the local and regional level to strengthen territorial, practical and theoretical access of Danube Region students to working or research opportunities. This means also cooperating at these levels to understand and observe how job markets are changing and what they require, in order to be well informed and updated on the regional framework changes.



*The Future of Research and Education in a Globalized World: a View for and from the Danube Region*

Accordingly, universities can create opportunities and integrate researchers and students by proposing new ideas for local development in terms of technology, industry, economy, finance, politics and social sciences as well as medicine and natural sciences. All study fields can be called upon to foster new ideas in cooperation with local entities, which can be done through calls for projects and start-ups, contests, field researchers, reporting in cooperation with regional institutions, workshops, practical experiences, etc.

Universities can align with changes and not only adapt but shape markets changes by developing guidelines as key players in fostering new human and technical competences.

Universities must go beyond current partnerships and invest outside their walls, not letting third parties enter universities systems but instead offering what is created inside universities: students' and researchers' ideas, start-ups, research projects and programmes.



# What should we not do?

University administration should not avoid monitoring European and regional research opportunities and create the venues for “Danube students” to participate and apply for such work or research opportunities.

In this light, it is not a good idea to stop exchanges and limit advertising opportunities beyond national borders.

Universities and faculties should not avoid taking into consideration the added value of both practical knowledge and theory. Both sides of wit must be integrated and not kept aside when developing courses, creating opportunities and adapting to changes within local communities.

Universities invest in dialogues and partnerships with local entities capable of constituting new opportunities. In this view, universities try to capture opportunities related to new skills required by the job market and improve academic pathways according to these necessities in terms of knowledge and competences.

Resources for dialogues and cooperation on the ground should be increased through stronger financial and administrative support by the local municipalities, the region or the different departments.

## Policy recommendations

Infrastructure and services investments are needed if universities want to meet students’ and researchers’ needs, based on perspectives that would be discussed thanks to programmes focussed on psychological and career consulting, and social inclusion services through joint events and consultations with local entities.

Digital advancements should be prompted without avoiding focussing on student and researcher perspectives, ideas and start-ups that could enable professors, alone or in cooperation with municipalities and territorial research institutes, to foster both technological and social development.

### 3. The golden gate to the universe

#### Preferable scenario

*The most preferable of the range of scenarios lies in the hope that students and early-stage researchers will have the complete freedom and accessibility to whatever opportunity they choose to grasp.*

Avoiding any compulsory alignment of their studies with their career, students will be able to directly keep in touch with their desired industry and develop the particular skills necessary for practical engagement. Reinforcing the bridge between these two notions would be the full flexibility of university administration, aligning their mutual interests and providing the best opportunities for everyone. To provide them with additional motivation towards the main goal, universities will have their own 'corporate relations' sectors, each of them doing the corresponding task of bringing as many corporations as possible to collaborate and gain access to renewed ways of thinking and teaching of students.

Industry leaders would also have a chance to come in with freshly developed workshops, lectures and interesting facts targeting students in specific academic areas. Along with the corporate units in universities, it is an imperative to prepare everyone as much as possible for the exploration of the new work environment by familiarising them with the latest digital trends. Incorporating the labour market and business entities, as well as bringing more equality and sustainability to development ensures that the Danube Region rises in general prosperity, not only by lowering the unemployment, but also by allowing students to understand the current, contemporary trends across industries. Those interested in pursuing academic careers could also do so, given universities' flexibility. Keeping in touch with student needs and getting their constant feedback would be necessary to make sure that current regional trends coincide with emerging desires among the academic population.



Ensuring that universities are fully committed to their higher involvement goals, governments and other entities would always be able to additionally contribute, voluntarily providing funds to the most promising ideas, startups, and more exposure to students, whether they decide to pursue industrial, academic or scientific careers. Bringing domestic corporations, researchers and academic staff together would certainly reduce the scope of the ongoing unemployment, building a more integrated and diversified community with equal chances and more independent regions with reduced brain drain, lowering the scope of unforeseen contingencies and lags that usually make drastic disturbances.



# What should we do?

Provide equal professional opportunities for everyone - even in the modern era, there are still some layers of society lacking the resources that might bring them to social and professional inclusivity. Making sure that all geographical regions have easier access to universities and consequently the labour market should be highly emphasised on the way to increasing early-stage researchers' employment levels. Those in hardly-accessible geographic regions with no public transport, easy internet access or any other resources threaten their professional development, suffocating their potential. Public policies aimed at investing government proceeds into digitalisation and spreading the corresponding funding to those in higher need stands as an imperative to the idea of providing equal opportunities to everyone on the path to achieving their long-term life goals.

Have flexible academic foundation - as time passes, unification of universities worldwide has been shown to improve the quality of education. However, the provision of multiple academic orientations, curricula and programmes in the region might further increase the flexibility among universities and students, reducing the brain drain. Expanding the range of possible orientations might also provide us with more diverse employment benefits, be they in the form of a variety of job opportunities or in the form of further academic development.

Integrate multiple career orientations - creation of meta-work/professional skills focussed on bringing different industries and academics together to discuss the possible integration of curriculum with practical needs for employment. By providing students with multiple career options, further flexibility might be achieved without any costs and by hitting the current labour market trends with the right practical education. Students would be able to gain insights into the various professional working environments, choosing their own career paths. Workshops provided by industry professionals might spark further interest among students, incentivising universities to understand everyone's needs and wishes.

Improve cross-synergies - by coinciding the needs of the labour market and business entities, higher synergies between these institutions could be obtained, opening further possibilities for improvements and achieving greater employment levels. Universities and corresponding academic staff could potentially teach students all the tools necessary for active work in corporations. They are more likely to employ the ones already taught how to work in certain qualifications, without having to train newcomers.

Invest in sustainable development - the completion of all tasks regarding the most preferable scenario must not be done without taking care of the sustainable development of our procedure, making sure that it becomes profitable and beneficial in every sense. Gaining popularity and ever-increasing attraction, universities would bring more students and early-stage researchers together in the hope of building a stronger foundation of society that is certainly going to change the future for the better. Staying in line with the latest industry trends requires complying with the latest SDG goals.



# What should we not do?

Ignore academic and industrial desires and trends - as the employment of early-stage researchers requires greater flexibility, ignoring their upcoming desires and needs would most certainly disrupt the current economy, including not only the labour market, but also the motivation of the academic population. This would cause more disruption in public equality, missing the provision of equal opportunities in the labour market.

Ignore others' feedback - having everyone's feedback is one of the most important parts of reconciling the desires of students and industry requirements. Ignoring them would just cause further unemployment, forming a great mismatch between the potential workers' needs and job requirements, giving rise to structural unemployment and lowering wages.

Stick to one, universal way of thinking - not being able to bring together the thoughts of industry and academic leaders, innovative and entrepreneurial ways of thinking cause further problems in the equality and flexibility of universities and corresponding curricula. Digital mismatch increases and the bridge between these notions would partially collapse, aggravating the integration and employability of early-stage researchers. Universality and linearity in thoughts brings society towards greater rigidity, disturbing the long-run growth of the economy.

Cost-benefit analysis - implementing simple cost-benefit analysis leads us to better social outcomes, as it increases general social welfare through the reconciliation of everyone's needs. By evaluating the potential results of social policies, governments should follow the practice of choosing the ones that are the most certain to bring benefits to everyone, or at least to particular targeted groups, without violating the well-being of the others. In this way we ensure that policies are aimed at achieving the maximisation of everyone's utilities, which are represented by their own desired career and educational paths.

## Policy recommendations

Development dynamics - in the targeted long-run development paths, one should pay close attention to what the society must sacrifice today in order to bring prosperity in future periods. In other words, revolutionary/innovative ways of thinking require current generations to make sacrifices if they're willing to bring betterment to future generations. By coinciding the desired paths of employability and SDG goals, the efficient allocation of future resources requires sacrifices in terms of the distribution of today's resources, making current generations bear a higher burden of the change. Unity and consideration stand as an imperative to this idea.

Redirecting the funds - the efficient allocation of resources requires further rethinking of fiscal policies, at least in terms of taxation and spending systems. Implementing progressive tax systems would ensure that inferior parts of the society get what they desire through higher consumption and investments in their own progress and wellbeing. Through the cost-benefit analysis, the government is more than certain that their policies are being monetised and implemented correctly and swiftly, making sure no resource is wasted in an unnecessary way. Keeping the equality among every layer of society progressive, students and early-stage researchers would be able to have their work recognised not only in the region, but globally. This would bring additional funding to the new ideas, start-ups and promising uprising students on their way to the job market.



Reformulate decision-making - as most public policies are directly conducted by local governments, those employed within them must concentrate on perceiving the needs of the public and their own as one. Observing costs and benefits from their individual perspective should be transferred to more inclusive, general observation from different perspectives, bringing the 'public work' together with more concrete and concise policies. In this way we would be sure that there is no informational asymmetry between those making the decisions and those being affected by them. In other words, ex post analysis of the effects of the policy should be the same as the ex ante predictions of the most preferable outcomes of the policy. Universities, by carrying out statistical analysis and staying in touch with industry leaders and students should be able to have complete insight in how their own plans are contributing to the overall policy implementation. If the results appear to be unsatisfactory, further reconstruction of decision-making boards has to be carried out in a timely manner.

## Policy recommendations

Technological progress - in order to achieve digital literacy among all students, further technological progress needs to be introduced. Investing in the digital preparation of students makes sure everyone has access to the latest inventions that make either communication or work environment more efficient. So as to introduce benefits for every labour market participant, universities might have to bear the burden of digitalisation investments through their flexibility, thereby increasing IT know-how.

## 4.Screamers

### Wild card

*The wildcard scenario focusses on the strong development of the trends currently manifesting themselves at the EU and Danube countries levels. It is assumed that the conflicting trends in the EU lead to its splitting: either into a two-speed supranational entity or its total disappearance.*

This in turn leads to policymaking being adapted to a local context, to the specificity of each country in the Danube area, and to a total loss of clarity in the corresponding focus on creating clear professional development trajectories for early-stage researchers (ESR) and students. There is a distinct lack of coherence in policymaking connected with professional development for students.

This scenario takes into consideration structural changes at the EU level that influence the implementation of necessary steps at the national, regional, and local levels for how structural funds are allocated (for various purposes) and projects financed. This in turn has a heavy influence on the policymaking for the employability of students and ESRs.

The divergence between Member States is amplified and the future of working together towards common goals is jeopardised by the re-emergence of realpolitik in international affairs.

Taking into account a split of the EU into a two-speed entity, the founding members would focus on tighter integration and increased access to a common market through the free movement of people, capital, merchandise, and research. Founding members of the EU will therefore focus on creating and continuously improving the European Research Area with its aim of creating a single, borderless area for research, innovation, and technology.

It is estimated that students and ESRs, as the human capital enabling the implementation of this EU-wide policy in the Danube area, will migrate to any of the founding members of the EU.

In this view of the future of Europe, the megatrends are amplified – brain drain is estimated to increase from the newer members of the EU, and political forces that are currently gaining traction in those respective countries are going to push for an EU exit. It is assumed that local authorities will focus resources on public-private educational partnerships in an attempt to reproduce what was done in founding countries of the EU during the early years just to realise that the trends are amplified and the curriculum is not adapted to market needs.

Universities in Danube area countries are funded through a combination of public and private funds that put an emphasis on skill development rather than knowledge gain. Students and ESRs face a myriad of options for their development and professional development is left at the will of older researchers that are still an active part of universities.

Universities in the Danube area are acting as knowledge hubs for the human capital that is developed in the region and that migrates as soon as possible to the better-paid jobs, opportunities, and quality of life in Western Europe, pursuing their wishes abroad. Universities in the area forced by policymaking not adapted to realities that ESRs face in the job market focus on the development of hard skills which are not sought by companies.

## What should we do?

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Provide equal professional opportunities for everyone - even in the modern era, there are still some layers of society lacking the resources that might bring them to social and professional inclusivity. Making sure that all geographical regions have easier access to universities and consequently the labour market should be highly emphasised on the way to increasing early-stage researchers' employment levels. Those in hardly-accessible geographic regions with no public transport, easy internet access or any other resources threaten their professional development, suffocating their potential. Public policies aimed at investing government proceeds into digitalisation and spreading the corresponding funding to those in higher need stands as an imperative to the idea of providing equal opportunities to everyone on the path to achieving their long-term life goals.

Have flexible academic foundation - as time passes, unification of universities worldwide has been shown to improve the quality of education. However, the provision of multiple academic orientations, curricula and programmes in the region might further increase the flexibility among universities and students, reducing the brain drain. Expanding the range of possible orientations might also provide us with more diverse employment benefits, be they in the form of a variety of job opportunities or in the form of further academic development.

Integrate multiple career orientations - creation of meta-work/professional skills focussed on bringing different industries and academics together to discuss the possible integration of curriculum with practical needs for employment. By providing students with multiple career options, further flexibility might be achieved without any costs and by hitting the current labour market trends with the right practical education. Students would be able to gain insights into the various professional working environments, choosing their own career paths. Workshops provided by industry professionals might spark further interest among students, incentivising universities to understand everyone's needs and wishes.



# What should we not do?

**Conservatism** - (keeping the country's potential inside its own borders without the cross-country collaborations in the region; instead we should aim towards greater integration of countries and regional unity, creation of synergies).

**Keeping our eyes closed** - (explaining the imperative of being able to see and listen to regional needs and desires, avoiding selfishness and concentrating on dialogue).

**Sole focus on local issues** - (keeping the focus solely on local issues, avoiding the awareness of regional development and our own local surroundings at the same time).

**Suffocating internationalisation** - (pushing society down the nationalist road, leading to aversion to integration and newly proposed international ideas).

Internet and IoT monopolies - Internet and IoT monopolies should be broken up into smaller companies with access to financing, focussing on acquiring start-ups in the same field. This would be maintained through selected laws directly aimed at keeping the competition fair, so that it doesn't restrict anyone's potential in the labour market.

Focus on the development of professionally-run state services - education, medical and social services are offered free of charge and are subsidised by taxes paid by active social layers in the jurisdiction where they function, and contribute to the overall wellbeing of the country.

Continuous development and evolution of GDPR regulations - GDPR regulations should keep up with the evolution of data brokers' business and be highly mobile in establishing ownership of data.

## Policy recommendations

Enforcement of regulations similar to the EU's - corporations such as Meta and Alphabet that provide services to European users should abide by regulations from the EU.



*The views expressed in the publication are the outcome of the DRC Strategic Foresight project and do not represent the official position of the Danube Rectors' Conference (DRC).*

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One river,  
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