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# Contents

## **1. On the Importance of Data Harmonization in the Social Sciences**

**12**

PhD Nebojsa Petrovic, Full Professor and PhD  
Jadranka Kaludjerovic, Full Professor

## **2. How STEM Education, Business Sophistication, and Infrastructure Shape the Adoption of AI.**

**24**

MSc Andrija Leovac and PhD Dijana Kovacevic,  
Assistant Professor

## **3. Psychological counseling in higher education: experiences, challenges, and recommendations from a pilot project at the University of Donja Gorica**

**42**

MSc Ana Maksimović, Milena Ratković, Dragana Pešić,  
Mira Raspopović, MSc Tea Grgurović, Jovana Domnik  
and MSc Ana Božović

## **4. The New World Order: Historical Patterns and Current US-China Dynamics**

**68**

PhD Ivan Piper and MSc Aleksandra Gogić

## **5. The Need for Holistic Approach in Education**

**94**

PhD Ivan Piper, MSc Amil Orahovac, MSc Ema  
Mandic and PhD Ivana Katnic, Associate Professor

## **6. Nobel Laureates: How the World's Greatest Economic Minds Shaped Modern Thought – a book review**

**134**

MSc Maja Juncaj

## **7. Understanding social entrepreneurship- case study of University of Donja Gorica**

**160**

MSc Jovana Popovic and MSc Katarina Scepanovic

# 1.

## On the Importance of Data Harmonization in the Social Sciences

Nebojša Petrović, Jadranka Kaluđerović



# On the Importance of Data Harmonization in the Social Sciences

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## ABSTRACT:

This paper addresses the importance of data harmonization in the social sciences, particularly in international studies, where data collection, coding, and interpretation standards vary significantly across countries and contexts. Through a focus on the COST Action 16111 project, ETHMIGSURVEYDATA (The International Ethnic and Immigrant Minorities' Survey Data Network), the paper highlights the methodological challenges of harmonizing data on ethnic and migrant minorities (EMMs) regarding their economic, social, and political engagement. Key issues identified include differing definitions of political participation and social engagement, as well as variations in data collection methodologies. By developing guidelines and standardized questionnaires adapted for cultural contexts, the project has contributed to data consistency and reliability, enabling comparative analyses across diverse sociopolitical settings. Additionally, the creation of a data-sharing platform enhances transparency and accessibility, facilitating interdisciplinary and cross-national research. This infrastructure fosters a more comprehensive understanding of socio-political processes and provides a foundation for informed decision-making to support social progress.

**Keywords:** Data Harmonization, Social Sciences, Ethnic and Migrant Minorities, Political Participation, Comparative Analysis

## INTRODUCTION AND LITERATURE REVIEW

Recently, there has been a growing number of researchers and studies in the social sciences. This increase should theoretically lead to a proportional rise in the overall benefits from such research, especially since many academic institutions require that research be policy-oriented. However, numerous fragmented studies with varied data collection methods, sample differences, and other inconsistencies often prevent simple aggregation or direct comparison of data. Additionally, the circumstances under which data may be collected or applied vary widely, including peacetime, wartime, periods of interethnic conflicts, misunderstandings between local populations and migrants, and internal political tensions, among others. These varying contexts limit the possibility of using the same data in an identical manner. What is essential is to bring data to a common denominator, enabling comparison and integration into broader frameworks. Data harmonization in the social sciences is a crucial step in ensuring the reliability and comparability of research, particularly in an era increasingly reliant on interdisciplinary analyses and cross-country comparisons.

Unlike the natural sciences, the social sciences often face challenges related to the diversity of data collection methods, varying contexts, and the unique characteristics of cultural, political, or economic environments. For instance, in psychology, different questionnaires and tests are used to measure similar constructs, such as extraversion or locus of control (Jowell et al., 2007). However, variations in language, cultural background, and social norms can significantly impact how respondents interpret and respond to questions. What is considered acceptable behavior in one culture may be seen as inappropriate in another, affecting the validity and reliability of the data. Harmonizing questionnaires and methods help overcome these challenges by adapting content to make it comparable across different cultural contexts and collection periods, while preserving the original meanings and constructs used (Harkness et al., 2010).

For instance, definitions of employment may vary: in one country, a person working only a few hours per week may be classified as employed, while in another, they may be considered unemployed or partially employed. Similarly, inflation rates may include different baskets of consumer goods, meaning that differences in how inflation is measured can significantly impact the comparability of economic data between countries. Harmonizing these data is crucial for drawing accurate conclusions about economic development and living standards.

We might say that data harmonization is the process of unifying various data fields, formats, dimensions, and columns into a single dataset. This process is essential for achieving data consistency and reliability, which is of great importance in academic research and in the analysis of complex social, economic, and environmental phenomena (OECD, 2008). Harmonization enables the standardization of data from different sources, facilitating its use in analysis and in forming conclusions (Nardo et al., 2005).

Various composite indices are often the only viable solution to overcome data harmonization challenges on a global level, allowing for the creation of a common reference framework to assess different societal aspects. These indices typically represent a mathematical combination of individual indicators reflecting various dimensions of a concept. Data harmonization plays a crucial role in developing these indices, as the data often come from different sources and have varied formats and units of measurement (Mazziotta & Pareto, 2013). One of the most well-known is the Human Development Index (HDI), which includes data from multiple areas to provide a comprehensive picture of the quality of life in a country, taking into account health, education, and income as primary factors. Since these data are collected differently, harmonization is essential to ensure that results from different countries and from various periods within the same country are comparable.

These indices are highly valuable as they enable the straightforward assessment of complex social phenomena that encompass multiple dimensions of development, quality of life, or social progress. Further, the Gini coefficient is widely used as a measure of economic inequality, allowing for comparisons across countries and providing insights into the degree of income inequality in different societies. The Global Innovation Index combines multiple indicators, including investments in research and development, educational resources, and the institutional environment, enabling the monitoring and assessment of countries' innovative capacities.

Such indices provide policymakers, researchers, and the public with a means to understand where different countries stand in terms of specific aspects, such as economic inequality, innovation levels, or minority rights. For instance, the Corruption Perception Index measures perceived corruption levels in the public sector, which is crucial for understanding political stability and trust in institutions. There is even a Global Happiness Index, originating from Bhutan, which attempts to

quantify the population's subjective sense of well-being.

The reliability of these indices depends on the quality of the collected data and the success of harmonization. Through the data harmonization process used in these indices, it is possible to reduce variability and uncertainty, ensuring that the results obtained can be reliably used in planning and implementing concrete measures that contribute to social progress (de Leeuw et al., 2008). Data harmonization and the development of composite indices are foundational steps in contemporary research, enabling comprehensive analysis and comparison of complex phenomena. Standardized and harmonized data provide researchers with a dependable foundation for analysis and interpretation, thus enhancing the quality of academic studies and supporting informed decision-making across various areas of social life (OECD, 2008; Saltelli, 2007).

The need for data harmonization is particularly evident in international studies, where differences in data collection, coding, and interpretation standards create challenges (Blasius & Thiessen, 2012). Without a shared framework or methodology, interpreting results becomes difficult, as the same concept may hold different meanings and interpretations across societies. Harmonization reduces these discrepancies, enabling researchers to analyze data in a way that leads to valid conclusions about social processes, behaviors, and attitudes.

The COST Action 16111, known as **ETHMIGSURVEYDATA** - The International Ethnic and Immigrant Minorities' Survey Data Network, focused on harmonizing data regarding the economic, social, and political engagement of ethnic and migrant minorities (EMMs). The project aimed to bring together researchers from academic institutions, policymakers, and large corporations working with data, such as GESIS, to collectively improve access, usability, dissemination, and standardization of data on EMMs integration. The project addressed methodological challenges associated with aligning data from various sources and countries, with a particular emphasis on how different social, political, and economic contexts affect the collection and analysis of data on ethnic minorities and migrants.

Differences can manifest in various aspects of the research process: from question formulation, targeting specific groups, to approaches toward minorities. For example, some countries focus their research on indigenous minorities, while others concentrate on migrants from

diverse backgrounds. In Spain, for instance, there are various migrant communities: migrants from Latin America, wealthier EU countries like Germany, poorer countries such as Romania, as well as migrants from North Africa, the Middle East, and Ukraine. Members of each of these groups have migrated for different reasons, from those fleeing war to those seeking retirement in a warm coastal climate. Each group faces a unique approach from authorities, laws, and local populations (Bourhis et al., 1997). This means that the questions asked and the way respondents are treated can vary significantly depending on the group, adding further complexity to data harmonization (Huijnk et al., 2015).

A similar example can be found in Montenegro, a country with a relatively small population but a significant number of migrants from Russia, Ukraine, and, more recently, Turkey. These migrant groups can have a substantial impact on the population structure, even approaching the size of the local population. This situation may influence various future political decisions, including issues of civil rights (e.g., voting), economic policies, and access to services such as education and healthcare. Data collection on these groups must account for specific challenges, such as different migration motives (e.g., fleeing war, economic opportunities, investments) and the varying perceptions and treatment of these groups by local populations and authorities. For example, Russian migrants may be treated differently from Turkish migrants due to cultural and political factors, which further complicates data collection and analysis, necessitating careful harmonization to ensure all aspects of migration and integration are adequately addressed. This complexity increases further when including minority groups, whether indigenous ethnic minorities such as Albanians or the Roma, a vulnerable minority group in many regions. Each of these groups faces a unique approach from authorities, laws, and the majority population. This means that the questions asked and the way respondents are treated can vary significantly depending on the group, greatly complicating data harmonization.

However, in a potential comparative study between Spain and Montenegro on migrant integration, an initial attempt to harmonize data could have failed because different definitions of "integration" were used. While Spain focuses on social and cultural integration, Montenegro prioritizes legal and economic aspects. This discrepancy could lead to conflicting results and underscored the need for clearer guidelines and shared definitions in cross-national research.

One of the main goals of the COST project was, therefore, to identify key

challenges in data harmonization, such as differing definitions of political participation and social engagement, as well as variations in how data on these phenomena are collected. For instance, in some countries, political participation includes activities such as protests, volunteering, or NGO membership, while in others, the focus is placed on more formalized forms (e.g., conditions for obtaining citizenship). These differences lead to inconsistencies in research findings and make it challenging to compare socio-political engagement across countries.

This COST action developed guidelines for standardizing data collection, including recommendations for using common definitions and instruments that enable consistent data collection (Morales et al., 2020). For example, standardized questionnaires were developed that are culturally adapted yet still allow for comparability of results across different contexts. Additionally, the project emphasized the importance of training researchers and interviewers to ensure consistent methodology application and reduce errors during data collection.

To further illustrate the methodology, we will present an example of how survey instruments were adapted to different cultural contexts. In Spain, survey questions about political participation were modified to include both formal (voting, party membership) and informal (protests, social media activism) activities, reflecting the local socio-political landscape. Similarly, in Montenegro, survey instruments could be adjusted to account for diverse migration motives and legal statuses. For instance, specific questions should be included to capture both economic migrants and those fleeing conflict, which ensured more accurate and context-sensitive data collection.

Despite the efforts made in the COST Action project, one limitation was the lack of longitudinal data from certain countries, which restricted the ability to analyze long-term trends in migrant integration. Future projects should focus on ensuring not only geographic coverage but also temporal continuity to enable robust longitudinal analyses.

One of the key outcomes of COST Action 16111 was the development of a data-sharing platform, which allows researchers access to harmonized datasets from various countries. This platform not only facilitates researchers' access to relevant data but also contributes to transparency in the research process, enabling data reuse and verification of findings. Such infrastructure represents an important step in empowering researchers to conduct comparative analyses and gain a

better understanding of socio-political processes on a global scale. The project results showed that data harmonization significantly enhances the accuracy and validity of findings related to social movements and political participation. Harmonization helps avoid misinterpretations that may arise from methodological differences, instead providing a clearer picture of how various forms of social engagement operate in different contexts. The project also highlighted the need for ongoing collaboration among the academic community, public opinion research agencies, relevant ministries, and other stakeholders to improve data harmonization in future research (Morales et al., 2020).

Data harmonization can also contribute to greater transparency and reproducibility in research. In the social sciences, it is common for different researchers to arrive at varying results, even when studying similar topics, due to inconsistencies in data. By standardizing data collection and analysis, we achieve a higher level of transparency, which fosters trust in research and allows for findings to be retested (Smith, 2011).

Data harmonization enables more efficient use of existing resources. Data collection is often costly and time-consuming, and harmonization allows for the reuse of existing data for different analyses without the need for repeated studies. This ensures optimal use of resources and opens up opportunities for new research that can provide valuable insights into social changes (Vannieuwenhuyze & Loosveldt, 2013).

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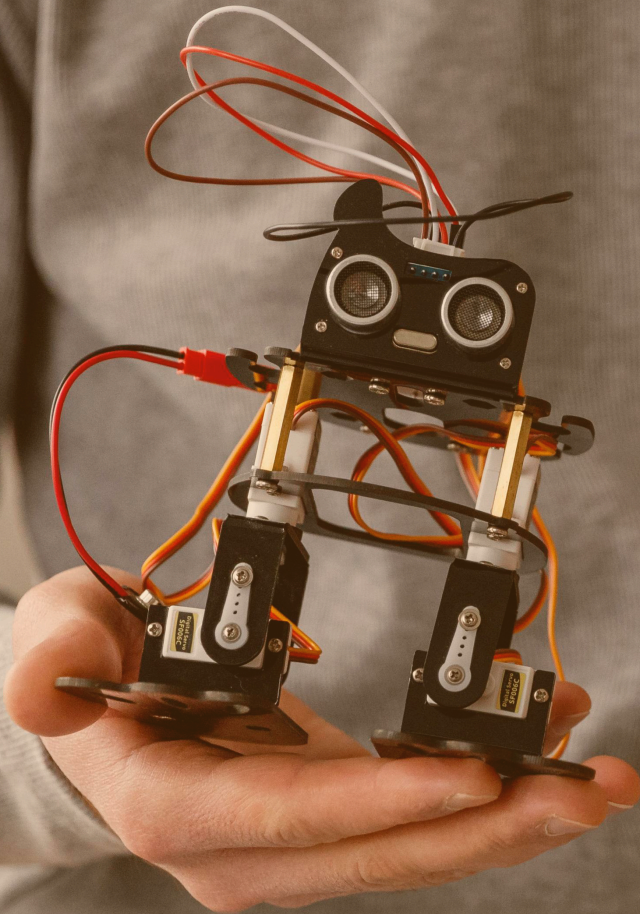
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# 2.

## How STEM Education, Business Sophistication, and Infrastructure Shape the Adoption of AI.

Andrija Leovac, Dijana Kovačević





# How STEM Education, Business Sophistication, and Infrastructure Shape the Adoption of AI.

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## ABSTRACT:

This study explores the factors which influence AI adoption rates among businesses by analyzing the impact of STEM graduates, the Business Sophistication Index, and the Infrastructure Index on the percentage of companies integrating AI into their processes. Using data from the EU Commission ICT Adoption Survey and the IBM AI Adoption Index, alongside additional metrics from the OECD database and the Global Innovation Index, the study uses Multiple-Linear Regression (MLR) to evaluate the relationships between these variables across 50 countries. The results demonstrate that STEM education and business sophistication significantly drive AI adoption, while the Infrastructure Index presents a surprising negative correlation. This finding suggests that AI technologies, particularly large language models, rely less on physical infrastructure and more on accessibility and readiness, creating an even playing field for adoption.

**Keywords:** AI adoption, Innovation, STEM education, Infrastructure, Business environment

## 1. INTRODUCTION

The adoption of artificial intelligence has become a tipping point of modern technological change, enabling businesses to boost efficiency, innovation, and competitiveness. Over the past decade, AI has evolved from niche applications to a key element of strategies across industries. This shift reflects technological progress alongside changes in workforce skills, business environments, and infrastructure. As AI continues to reshape the global economy, understanding why some countries or companies adopt it more readily than others is critical for policymakers and business leaders aiming to maximize its potential.

Although much research has focused on organizational-level AI adoption, the systemic factors influencing this process are less explored. Studies such as those by Norzelan et al. (2024) emphasize behavioral and organizational factors such as performance expectations, technical skills, and trust. Frameworks like the Technology Acceptance Model and the Unified Theory of Acceptance and Use of Technology examine the micro-level adoption dynamics but often overlook macro-level influences like national innovation systems, education, and infrastructure. These broader factors are crucial, as they create the foundation for organizational readiness and technological integration, especially in a globalized economy.

This study explores the impact of education, business sophistication, and infrastructure on AI adoption among businesses in 50 countries. By focusing on large enterprises, it highlights the factors that enable AI adoption in complex, resource-rich environments. The findings offer insights into enhancing AI readiness and supporting inclusive, effective adoption strategies at both national and organizational levels.

## 2. LITERATURE OVERVIEW

### 2.1. Theoretical frameworks for adoption

Understanding AI adoption relies on established theoretical frameworks like the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT). These models offer key insights into the factors influencing technology acceptance. TAM, introduced by Davis (1985), focuses on perceived usefulness and ease

of use as primary drivers of technology adoption. In AI, TAM explains how users assess tools based on their ability to improve efficiency and simplify tasks. Research, such as (Sharma et al., 2024), highlights the role of performance benefits in encouraging AI adoption, especially among users unfamiliar with advanced technologies. Studies like Norzelan et al. (2024) show that technical capabilities and organizational culture strongly influence AI adoption, while social influence plays a lesser role in some sectors. The Theory of Planned Behavior (TPB), developed by Ajzen (1991), links behavioral intentions to attitudes, norms, and perceived control. This is useful for analyzing AI adoption influenced by external pressures and organizational expectations. Comparative studies, such as those by Sohn and Kwon (2020), further illuminate the strengths and limitations of these frameworks. They found the Value-Based Adoption Model (VAM) more effective in contexts where enjoyment and subjective norms outweigh utilitarian concerns, illustrating the complexity and variability in AI adoption across different settings.

## 2.2 Determinants of AI adoption

AI adoption rates are influenced by a mix of micro and macro level indicators, like individual and organizational behavior, and macro-level elements, such as systemic readiness and structural support. Understanding the adoption process requires examining how these drivers interact to shape readiness and capability for integrating AI into business operations. This section focuses on the behavioral as well as organizational level factors that critically influence adoption decisions.

### 2.2.1. Behavioral and organizational drivers

Trust is a cornerstone of AI adoption. Hasija and Esper (2022) emphasize that transparent communication and demonstrable reliability in organizational strategies are critical for fostering trust, which in turn accelerates adoption. Similarly, Frank et al. (2023) underline the importance of trust in AI companies, while cautioning against over-reliance on AI autonomy, which can erode confidence. These studies highlight the nuanced balance required to design and implement AI technologies sustainably. Performance expectations and ease of use are significant behavioral determinants. In finance, the alignment of AI applications with organizational goals is critical. Norzelan et al. (2024)

find that technical skills and perceived tool performance are essential for adoption among financial leaders, reinforcing the importance of integrating AI into broader strategic objectives.

These behavioral and organizational drivers—trust, self-efficacy, perceived usefulness, and a supportive organizational culture—are essential for creating an environment where AI technologies can thrive. Addressing these factors comprehensively ensures that AI can be successfully integrated into diverse organizational contexts.

### 2.2.2. Systemic factors and macro-level influences

Systemic factors play a vital role in shaping AI readiness and adoption, operating at a broader scale than behavioral and organizational drivers. These include education, business sophistication, and infrastructure, yet their connection to AI readiness remains underexplored. Education is crucial for technological progress, with human capital enabling AI adoption. Coutinho and Au-Yong-Oliveira (2024) emphasize the role of STEM education in driving innovation across 64 countries, highlighting the importance of a technically skilled workforce. Nouraldeen (2023) further links students' willingness to embrace AI to digital literacy and technical training, underscoring the systemic importance of education in creating an AI-ready environment. Coutinho and Au-Yong-Oliveira (2024) identify factors like R&D collaboration, cluster development, and absorptive capacity as key drivers of technological competitiveness, fostering an environment where organizations can integrate AI effectively. Infrastructure, traditionally seen as essential for adoption, is evolving in the context of AI. Choi and Kim (2020) note that ICT infrastructure supports innovation but requires complementary factors like knowledge outputs and investment environments. Na et al. (2023) show that firms with advanced infrastructure are more likely to adopt AI, though cloud-based tools reduce dependency on physical systems. This shift allows businesses in less-developed regions to adopt AI if they have access to digital platforms, challenging conventional assumptions about infrastructure readiness.

### 2.2.3. Research gaps and implications

While education, business sophistication, and infrastructure are an

important factor of technological adoption, their direct relationship with AI readiness remains underexplored. Most existing studies focus on broader innovation metrics or specific industries, leaving a gap in understanding how these factors interact to influence AI adoption on a national scale. Addressing this gap is essential for developing targeted data driven policy decisions and strategic positioning to foster AI readiness across diverse contexts.

### 2.3. Sectoral perspectives on AI adoption

AI adoption varies across sectors due to differences in demands, capabilities, and contextual factors. Each sector faces unique challenges and opportunities shaped by operational goals, resources, and regulatory environments, with healthcare, education, finance, and the public sector leading in AI integration.

In healthcare, AI enhances diagnostics, streamlines operations, and cuts costs. Pham et al. (2024) projects AI-driven cost savings of up to 10% annually in U.S. healthcare. However, ethical concerns such as trust, privacy, and data security, highlighted by Wang (2023), remain barriers, requiring transparency and accountability for sustainable adoption. In education, AI is transforming learning. Sharma et al. (2024) show that perceived effectiveness and self-efficacy drive adoption in Indian higher education, while Nouraldeem (2023) identifies digital literacy and institutional support as key to overcoming barriers like resistance to change and infrastructure gaps. Targeted interventions are critical for fostering readiness in diverse contexts. The finance sector uses AI to improve efficiency and customer experiences through tools like chatbots and robo-advisors. Studies such as Saxena et al. (2023) highlight trust and perceived utility as vital for adoption. Regulatory compliance and algorithmic fairness remain ongoing challenges. The public sector leverages AI to enhance service delivery and decision-making, as noted by Grover et al. (2022). However, bureaucratic inertia and privacy concerns often hinder progress.

### 2.4. Research gaps and contribution

Despite significant advancements in understanding AI adoption, a notable gap exists in the explicit exploration of how systemic factors—such as

education, business sophistication, and infrastructure—directly influence AI readiness and adoption rates. Current research predominantly focuses on behavioral and organizational drivers or sector-specific dynamics, with limited emphasis on the broader structural enablers of AI adoption. While studies like those by Coutinho and Au-Yong-Oliveira (2024) and Choi and Kim (2020) address education and ICT infrastructure as contributors to innovation performance, their relationship with AI adoption remains underexplored. Similarly, the role of business sophistication in fostering innovation ecosystems is well-documented, but its specific impact on the integration of AI technologies at the organizational level warrants further investigation. The evolving nature of AI technologies, particularly the new cloud-based large language models, further complicates traditional assumptions about systemic readiness. As demonstrated in Na et al. (2023), infrastructure's influence on adoption may vary depending on the specific technological context, challenging the long-held belief that robust physical infrastructure is always a prerequisite. This shift highlights the need to reevaluate systemic factors across diverse national and organizational contexts. Existing research, often localized or industry-specific, misses the broader insights offered by cross-national studies, while reliance on small datasets limits generalizability.

In order to examine the mentioned gaps, this study poses the following research question: How do systemic factors influence AI adoption across organizations globally? By bridging the gap between systemic readiness and AI implementation, this study not only expands the theoretical framework for understanding technological adoption but also provides actionable insights for stakeholders aiming to harness AI's potential.

## 3. METHODOLOGY OF THE RESEARCH

This research takes a quantitative approach to analyzing the impact that the percentage of graduates, infrastructure and business sophistication index have on the percentage of the companies that have adopted AI within their business process. Building on the works of Poba-Nzaou and Tchibozo (2022), who used a large scale EU commission ICT adoption study and adding to it data collected from IBM AI adoption index, the study provides an insight into how the AI adoption process is developing within 50 of the surveyed countries around the world. The data collection process for the dependent variable of this research is based on combining data from the two surveys. The main aspect of the

data collection is cross referencing the questions. For the purpose of this study, the question found needed to receive the same feedback from the participant across different surveys. Given that the aim of the research is to measure the actual adoption rate of AI among companies two question were made on both EU commission ICT adoption survey and IBM AI adoption index. Both EU and IBM have asked the following respectively:

“Did your company adopt at least one AI technology?”

“Did your company deploy at least one AI technology?”

In this case the words “adopt” and “deployed” (asked in the context of deployed in the business processes) have the same meaning therefore the answer to this question would be the same in both cases. Another thing both of them have in common is also a part of this study. Both of them are conducted on large companies (>250 employees).

The reason why this is important is that smaller companies often face distinct barriers to AI adoption. Many AI technologies are too expensive for their budgets, and simpler business processes may not require AI tools. Conversely, larger companies typically have more complex processes, offering greater opportunities for AI integration. Limiting this study to companies with over 250 employees avoids issues stemming from financial constraints or insufficient need for AI in smaller enterprises. Larger companies also generally have the purchasing power to adopt AI technologies, including free tools like "ChatGPT," which can be applied to various processes. Furthermore, data from reputable sources such as the EU Commission and IBM ensures reliability, with these datasets already validated in high-quality peer-reviewed studies. As for the independent variables, the data for the percentage of STEM fields graduates was used from the OECD database<sup>1</sup>, while the data for the Infrastructure and Business sophistication index were sourced from the Global Innovation Index by World International Patent Office<sup>2</sup>. Both of these include an extensive amount of different metrics within a country. The Business sophistication index is built around three main components under which different metrics are used.

### Business infrastructure index components

Knowledge Workers	Innovation Linkages	Knowledge Absorption
Knowledge-intensive employment, %	University-industry R&D collaboration	Intellectual property payments, % total trade
Firms offering formal training, %	State of cluster development and depth	High-tech imports, % total trade
GERD performed by business, % GDP	GERD financed by abroad, % GDP	ICT services imports, % total trade
GERD financed by business, %	Joint venture/strategic alliance deals/bn PPP\$ GDP	FDI net inflows, % GDP
Females employed w/advanced degrees, %	Patent families/bn PPP\$ GDP	Research talent, % in businesses

**Table 1.** Business sophistication index components

The infrastructure index is built around three main components under which different metrics are used.

### Infrastructure index components

Information and Communication Technologies (ICTs)	General Infrastructure	Ecological Sustainability
ICT access	Electricity output, GWh/ <u>mn</u> pop.	GDP/unit of energy use
ICT use	Logistics performance	Environmental performance
Government's online service	Gross capital formation, % GDP	ISO 14001 environmental certificates/bn PPP\$ GDP
E-participation	Electricity output, GWh/ <u>mn</u> pop.	-

**Table 2.** Infrastructure index components

For the purpose of the calculation all values Z-standardized in order to achieve a higher quality of results. The analysis utilizes Multiple-Linear Regression in order to test the significance of the three independent variables withing the following research model.

### Conceptual research model

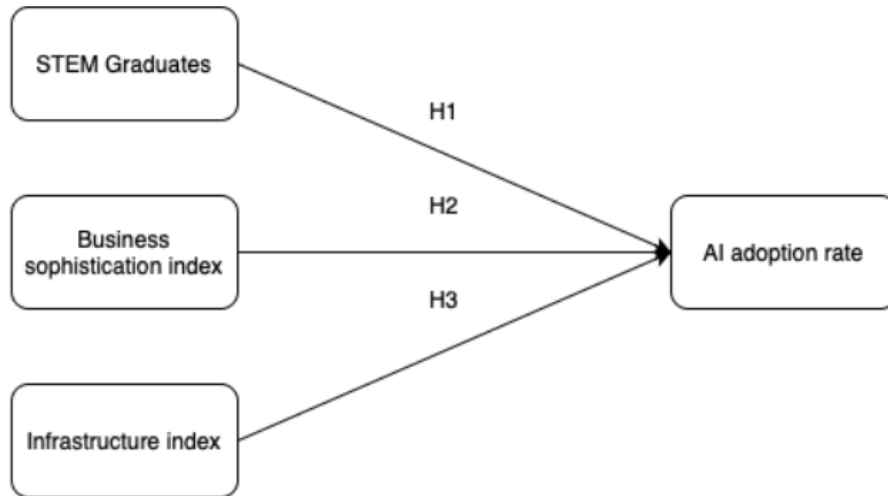


Figure 1. Research model

Building on the proposed research model and the defined variables, the following research hypotheses are proposed:

**H1:** The percentage of STEM graduates is significantly correlated with the AI adoption rate among companies.

**H2:** Business sophistication index is significantly correlated with the AI adoption rate among companies.

**H3:** Infrastructure index is significantly correlated with the AI adoption rate among companies.

In order to confirm and evaluate the findings of the regression different tests are used to test for multicollinearity, autocorrelation, homoscedasticity etc.

## 4. RESULTS AND DISCUSSIONS

The model demonstrated a moderate explanatory power, with an R value of 0.645 and an R<sup>2</sup> value of 0.416. This indicates that 41.6% of the variance in AI adoption rates among companies is explained by the three independent variables included in the model.

### Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.645	0.416	0.378	0.788790217360110	2.280

Table 3. Regression model summary

The ANOVA results confirmed the statistical significance of the overall model, with a p-value of less than 0.001, affirming that the independent variables collectively have a meaningful impact on the dependent variable. The Durbin-Watson statistic of 2.280 suggests no significant autocorrelation in the residuals, reinforcing the validity of the model's assumptions

### ANOVA RESULTS

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20.379	3	6.793	10.918	<.001b
	Residual	28.621	46	.622		
	Total	49.000	49			

Table 4. ANOVA



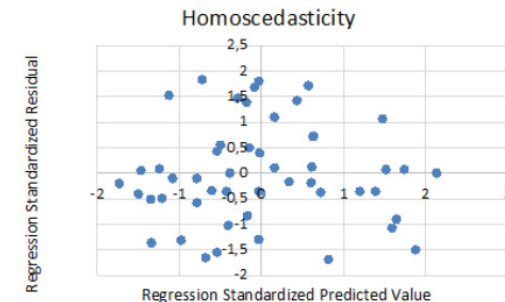
When examining the coefficients, each independent variable demonstrated a distinct impact on the AI adoption rate. The percentage of STEM graduates (zSTEMgrad) had a positive and statistically significant relationship with AI adoption ( $B = 0.265$ ,  $p = 0.026$ ), indicating that an increase in STEM graduates correlates with higher AI adoption rates. The Business Sophistication Index (zBusinessSophisData) exhibited the strongest positive influence ( $B = 0.898$ ,  $p < 0.001$ ), underscoring the critical role of business sophistication in fostering AI adoption. Conversely, the Infrastructure Index (zInfrastructureData) showed a negative and statistically significant relationship with AI adoption ( $B = -0.664$ ,  $p < 0.001$ ). Collinearity diagnostics indicated no significant multicollinearity issues, with VIF values for all variables well below the critical threshold of 10.

### Linear regression coefficients results

Model	Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error				Tolerance	VI F
1	(Constant)	1.821 E-15	.112		.000	1.000		
	zSTEMgrad	.265	.115	.265	2.300	.026	.956	1.046
	zInfrastructureData	-.664	.175	-.664	-3.793	<.001	.415	2.412
	zBusinessSophisData	.898	.173	.898	5.177	<.001	.422	2.371

**Table 3.** Regression coefficients results

Homoscedasticity plot testing showed an evenly dispersed variance as it can be seen in the following visual, indicating robustness of the data.



**Figure 2.** Homoscedasticity testing plot

## 4.1 Discussion

The positive correlation between STEM graduates and AI adoption confirms the first hypothesis (H1), demonstrating that a skilled technical workforce is vital for integrating advanced technologies. Countries with higher percentages of STEM-educated employees are better positioned to adopt AI, as they possess the expertise needed to understand and implement these solutions effectively. This aligns with prior research emphasizing STEM education's role in driving technological innovation.

The second hypothesis (H2) is validated by the strong positive influence of the Business Sophistication Index on AI adoption. Countries with sophisticated business environments show a higher propensity for AI integration, highlighting the importance of fostering ecosystems that encourage innovation, R&D, and adaptability to rapidly changing technologies.

The third hypothesis (H3) is also supported, but the negative correlation between the Infrastructure Index and AI adoption provides a surprising perspective. Unlike traditional technologies, AI tools, particularly cloud-based solutions like large language models, rely less on physical infrastructure. This shift allows countries with less-developed infrastructure to adopt AI technologies effectively, challenging conventional views that robust infrastructure is a prerequisite for technological innovation.

While infrastructure investments remain valuable, greater emphasis should be placed on fostering STEM education, enhancing business sophistication, and ensuring that AI tools are accessible to a wide range of businesses. This approach is essential for maximizing the potential of AI adoption across diverse contexts.

## 5. RESEARCH LIMITATIONS

This study provides important insights into AI adoption but acknowledges several limitations. The analysis focuses exclusively on large companies with over 250 employees, excluding SMEs, which also play a significant role in technological adoption. This choice, aimed at reducing variability from financial constraints and simpler business processes, limits the applicability of findings to smaller enterprises. Future research should include SMEs to provide a more comprehensive understanding of adoption dynamics. The study also examines only three independent variables—STEM graduates, the Business Sophistication Index, and the Infrastructure Index. While these are highly relevant, other factors such as industry-specific characteristics, cultural attitudes toward technology, and regulatory environments likely influence AI adoption but were beyond the scope of this research. Finally, the reliance on multiple-linear regression (MLR) assumes linear relationships, which may oversimplify the complexity of AI adoption processes. Although diagnostic tests confirmed the robustness of the model, alternative approaches like machine learning or structural equation modeling could reveal deeper insights into nonlinear relationships and multifaceted interactions among variables.

## 6. CONCLUSION

The study confirms that STEM education and business sophistication are key drivers of AI adoption, while infrastructure plays a less conventional role. Investments in STEM education build a skilled workforce essential for technological transformation, and fostering an innovative business environment promotes AI integration. The unexpected negative relationship between infrastructure and AI adoption reflects the shift toward cloud-based technologies, which reduce reliance on physical infrastructure and enable broader participation in the AI revolution.

The primary contribution of this research lies in highlighting the systemic

factors—education, business sophistication, and infrastructure—that shape AI adoption at a national level, offering new insights into their interplay. These findings challenge traditional assumptions about infrastructure's role and emphasize the importance of accessibility and readiness. Policymakers and business leaders can use these insights to prioritize education, business readiness, and access to AI tools to foster technological adoption. Future research should explore additional variables, SMEs, and sector-specific dynamics to deepen understanding and broaden the applicability of these findings.

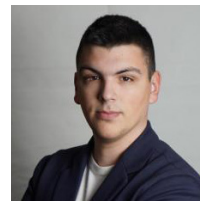
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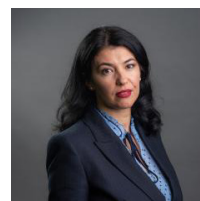
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# 3.

## Psychological counseling in higher education: experiences, challenges, and recommendations from a pilot project at the University of Donja Gorica

Ana Maksimović, Milena Ratković Fehilly, Dragana Pešić, Mira Raspopović, Tea Grgurović, Jovana Domnik, Ana Božović





# Psychological counseling in higher education: experiences, challenges, and recommendations from a pilot project at the University of Donja Gorica

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## ABSTRACT :

The aim of this paper is to point out the importance of student psychological counseling centers at higher education institutions. We first review the mental health challenges faced by students, highlighting common issues such as stress, anxiety, and depression, which impact their academic and personal well-being. Then, solutions implemented by higher education institutions (HEIs) globally, particularly the establishment of on-campus psychological counseling services, are discussed. Focusing on Montenegro, the paper examines the national mental health care system, which faces challenges in addressing the specific needs of students. The

pilot project at the University of Donja Gorica (UDG) is explored as a case study, detailing student experiences with the counseling services and providing recommendations for improving and expanding such initiatives in the future

**Keywords:** mental health, students, counseling center, University of Donja Gorica

## 1. INTRODUCTION

According to the World Health Organization (WHO), mental health is a state of well-being in which an individual realizes his potential, successfully faces normal life stresses and challenges, becomes productive and capable of contributing to his community. WHO emphasizes the fundamental role of mental health in overall well-being through the famous statement: "There is no health without mental health." That's why World Mental Health Day is celebrated on October 10. It was first established in 1992 with the mission to raise awareness on an international level about mental health and the importance of its preservation. A person in good mental health expresses a positive attitude towards life, the ability to be happy with a strong sense of self, while at the same time creating and maintaining quality relationships with other people. Moreover, mental health is a foundation that enables people to realize their potential. Importantly, in order to achieve and improve this delicate equilibrium of factors underlying mental wellbeing, it is necessary to invest in the emotional, psychological, social, physical and spiritual components of our personalities.

Although mental health is one of the key life prerequisites for individual well-being and a generator of personal growth and socioeconomic development, it is influenced by various risk factors. These factors stem from the contexts in which people are born, grow up, work, live, and age (Oliveros, Agullo-Tomas & Marquez-Alvarez, 2022). The list of reasons is extensive with key factors including poor physical health (Das et al., 2008), most commonly poverty as well as digitalization and globalization which contribute to social isolation, vulnerability and destructive behavior. Young people, particularly adolescents and young adults, represent one

of the most at-risk populations for developing mental health issues and difficulties (Ridley, 2020). This vulnerability is correlated to a multitude of factors across different bio-psycho-social domains (Jabbarov et al., 2024; Henriques, Moura & Goncalves, 2025).

Within the current academic landscape, students are not only expected to acquire theoretical knowledge but also to develop a wide range of competencies necessary to navigate an increasingly complex and dynamic environment (Deng et al., 2022). Challenges are reflected in transition to university, confusion and disorganization with obligations and academic pressure regarding achievements (Czeslaw Czabala, 2016; Sheldon et al, 2021). These academic pressures can lead to considerable emotional distress, especially when students' performances does not align with personal or external expectations. Psychologically, this often manifests as feelings of hopelessness, being overwhelmed, anxiety, low self-esteem, and fear, which may lead to behavioral issues or social withdrawal. Furthermore, the social dynamics of university life can expose students to peer pressure and increase the risk of social exclusion, adding to their emotional burden. Consequently, the growing number of students experiencing psychological distress is an increasingly pressing concern in higher education (VanderLind, 2017; Brunner et al., 2017). Empirical studies highlight that variables such as self-regulation, parent-child conflict, and subjective well-being mediate the relationship between academic pressure and problematic behavior among students (Jiang et al., 2022). Additionally, stress levels and academic self-efficacy play a pivotal role in shaping students' academic trajectories (Zajacova, Lynch & Espenshade, 2005). Students with a strong sense of academic self-efficacy tend to experience lower stress, demonstrate better adjustment to university life and are generally perceived as psychologically healthier and more satisfied individuals (Hitches, Woodcock & Ehrich, 2022, according to Chemers et al., 2001). Notably, higher life satisfaction is often associated with improved academic performance and vice versa highlighting the potential of interventions aimed at enhancing students' mental health to positively influence academic success (Rožman, Vrečko & Tominc, 2025).

In response to the growing awareness of mental health challenges faced by students, institutions around the world have increasingly acknowledged the significant impact these issues can have on academic performance, well-being, and long-term development. From rising stress levels and reduced academic self-efficacy to difficulties in emotional regulation and social adjustment, universities have recognized

the urgent need to address these concerns in a comprehensive and proactive manner. As a result, a wide range of strategies have been implemented globally – from awareness-raising campaigns aimed at destigmatizing mental health struggles, to peer support networks and training programs for faculty and staff. Among the most impactful and widely adopted measures are the establishment of free psychological support and counseling services for students. These services represent a cornerstone of student well-being strategies, offering a safe and confidential space where individuals can receive professional guidance, develop coping skills, and foster psychological resilience essential for both academic and personal growth.

Psychological counseling, defined as a procedure of restoring disrupted mental health due to internal or external influences (Georgoulas, 2019 according to Malikiosi-Loizou, 1996), aims to enhance personal and interpersonal functioning across the lifespan (Suman, 2016). Psychological counseling helps individuals, groups, and organizations develop their full potential (Ivey, 1979) through three components: curative, restorative, and preventive. Curative component refers to the correction of dysfunctional behavior, restorative aims to expand individuals' capacity for growth, while preventive relates to the development and maintenance of health and well-being (McIlveen, 2015). In academic literature, the distinction between psychological counseling and psychotherapy is defined through several key dimensions. Primarily, counseling is typically applied in cases of short-term and less severe emotional difficulties, whereas psychotherapy focuses on long-term and chronic psychological issues. Structurally, counseling is more oriented toward providing advice and education, while psychotherapy involves deeper and more complex interventions. Counseling also tends to be more directive, in contrast to the generally less directive nature of psychotherapy. In terms of context, counseling is commonly implemented within educational and social settings, while psychotherapy is more often associated with clinical and medical environments (Osagu & Omolayo, 2013). Other authors support a similar distinction, emphasizing that the primary aim of psychotherapy is personality change, while counseling is directed toward personal development and helping clients make more effective use of their existing life resources (Milačić, 2022; Rakovec, 2019; Suman, 2016; Czabala, 2016; Scorsolini-Comin, 2014). Although both approaches involve similar techniques such as listening, questioning, interpreting, and giving feedback, the extent and depth of their application often differ (Sommers-Flanagan & Sommers-Flanagan, 2004).

Psychological counseling usually takes place in counseling centers confidential places for supporting people who have experienced psychological discomfort. Work in the counseling center involves carrying out activities such as individual work, i.e. one-on-one support with the aim of strengthening problem-solving skills, overcoming stress and emotional regulation. The mentioned activities can be carried out with a larger group of people and then it is structured support (support groups). Workshops are interactive, preventive programs designed to develop skills and promote mental health and career counseling is aimed at support in professional development, evaluation of abilities and creation of career strategies (Conley et al., 2017; Corey, 2015; Gelso & Fretz, 2001).

In the context of higher education counseling centers serve a professional role as a training ground for future counseling psychologists (Todorović et al., 2021). But primarily, it's designed to address students' needs, with a focus on self-directed learning, skill development and personal empowerment. This service offers young people a space of continuity and quality necessary to overcome challenging periods and to build up their resilience capabilities and personal resources as well as awareness and readiness to seek help and support in situations when they need it.

Building upon the aforementioned aspects, following sections of the paper discuss the existing scholarship on the mental health and challenges faced by students as well as examples of good practice, followed by an overview of existing youth support services in the fields of, respectively, mental health in Montenegro and institutions of higher education globally, to then focus on a specific case of a pilot initiative of the psychological counseling center at the University of Donja Gorica, and a conclusion highlighting need for such services within higher education institutions.

## 2. LITERATURE OVERVIEW

### 2.1. Mental health and well-being in academia

Students, as a demographic group, encounter distinct challenges that elevate their risk of mental health issues. Bedewy and Gabriel (2015) found that students were frequently exposed to high levels of stress

due to the combined demands of academic responsibilities and personal obligations, often resulting in mental health difficulties such as anxiety and depression. Research identifies multiple contributing factors, including academic stress, the transition from a structured family environment to independent living and financial obligations. The pressure to excel academically, coupled with uncertainties about career prospects after graduation, is a significant source of anxiety and depression among students worldwide (Bekkouche et al., 2021; Pascoe et al., 2019; Beiter et al., 2014). A study by Hunt and Eisenberg (2010) found that the prevalence of mental health issues among college students has been steadily increasing, exacerbated by factors such as workload intensity, lack of sleep, and concerns about future employment opportunities. Moreover, students often perceive academic life as a primary stressor due to the necessity of balancing personal and educational demands. Additionally, social pressures related to forming new relationships and navigating identity development further complicate their mental well-being.

To mitigate these challenges, various psychological techniques and interventions have been proposed in the literature. One such approach is the concept of mental hygiene, which focuses on preventive strategies to maintain psychological well-being. Tremblay, Rodrigues and Gulati (2021) define mental hygiene as a set of practices aimed at preserving mental health through self-care routines, emotional regulation, and structured coping mechanisms. Their study emphasizes that adopting mental hygiene practices such as stress-reducing exercises, healthy sleep habits, and social support networks can reduce anxiety levels, improve emotional resilience, and enhance overall mental health stability. Importantly, the study has provided further empirical support to the notion of effectiveness of psychological counseling in such situations. Research suggests that early intervention and continuous counseling support help students develop adaptive coping strategies, manage academic stress, support well-being and assist in preventing mental health issues (Brunner et al., 2014). Also, cognitive-behavioral techniques, mindfulness training, and time management strategies have all been linked to reduced stress levels and improved academic performance (Regehr et al., 2012). Considering these challenges, it is essential to develop support systems that address both the academic and socio-economic factors affecting students' mental health, as demonstrated by the practices of top-ranked universities worldwide.

That's why the existence of specific psychological counseling services for students at elite and the highly ranked universities globally comes as no surprise. Let's start with our partner university Arizona State University (ASU), whose counseling services include call center available 24/7 call and conversations, as well as crisis intervention for students throughout the year. Live and online communication with licensed counselors is made possible through a dedicated portal. Harvard has a multi-specialty medical practice and a 24/7 support line for students experiencing mental health issues. A public list and contact list of care providers is also available for all members of the Harvard academic community. In addition to Counseling and Psychological Services (CAPS), Stanford also provides virtual mental health care that can be accessed by all students on US soil. The Massachusetts Institute of Technology (MIT) has a student mental health and counseling department that is accredited by the International Association of Counseling Services (IACS).

Conversely, mental health support structures are available at universities across Europe. For instance, University of Oxford offers a range of specialist services: in addition to counselling, there are services for people with disabilities and support for sexual harassment and violence. The Psychological Support Service (SAP) at the world's oldest university in Bologna can be contacted by students and young people between the ages of 20 and 28, and the costs of the services are covered by the Health Administration. The service has existed since 1985.

Good practice is also followed by regional universities. In neighboring Serbia, these are the psychological counseling center within the Center for Career Development of the University of Belgrade, as well as the counseling center in Niš, which has been in existence for almost 20 years. Universities in Zadar, Pula and Zagreb in Croatia have a long-standing tradition of providing psychological support. The Office for Student Support (UPS!) is open for students of the University of Sarajevo, and from 2022 students can schedule counseling at the premises of the Faculty of Philosophy of the University of Banja Luka. Of particular note is the Psychosocial Counseling Center at the University of Ljubljana, which is open to both students and academic staff.

Thus, both research and everyday practices from a plethora of institutions across different cultural and social dimensions of the higher education landscape offer empirical evidence of the effectiveness of the psychological support services for students. However, doubts remain about the long-term sustainability of such platforms since student

counseling centers are mostly represented at individual faculties and do not have the status of an institutional form of primary prevention in the field of mental health, but are the often results of (pilot) projects that are supported and financed from alternative sources (Randelović et al, 2015).

## 2.2. Case of Montenegro

While these challenges are prevalent among students worldwide, Montenegro's unique socio-economic landscape amplifies their effects. Montenegro struggles with high youth unemployment rates in combination with limited career opportunities, making academic stress even more intense for students who fear an uncertain future. Labor market indicators reveal that Montenegro's youth unemployment rate stands at 38%, significantly higher than the EU-28 average of 25%. Additionally, the youth underemployment rate in Montenegro is 19.4%, according to the ILO definition, and a striking 68.3% according to a broader definition that includes factors like overqualification and job insecurity. This suggests that a significant proportion of employed youth in Montenegro face underemployment, exacerbating the difficulties associated with the transition from education to the workforce and contributing to the mental health challenges faced by students (Petreski et al., 2019).

Since 2006, Montenegro has witnessed significant developments in the field of academic psychology, beginning with the establishment of a Psychology program at the Faculty of Philosophy in Nikšić, University of Montenegro, aimed at educating professionals in the domain of mental health. That same year, a program in Business Psychology and Psychological Counseling was launched at the Faculty of Business Management in Bar. A decade later, in 2016, the University of Donja Gorica (UDG) introduced the Applied Psychology program within its Faculty of Applied Sciences. Beyond its academic mission, this program is firmly committed to the promotion, preservation, and enhancement of mental health—both within the university community and beyond. Reflecting this commitment, UDG provides incoming students with access to psychological counseling services at the very start of the academic year.

Moreover, UDG traditionally marks dates dedicated to mental health such as World Suicide Prevention Day (September 10), International Mental Health Day (October 10) and World Children's Day (November 20) and



actively contributes to the promotion of this concept in the community<sup>1</sup>. An example of such an activity is participation in the Mental Health Festival, organized for the first time in 2023<sup>2</sup> where 150 students had the opportunity to discuss stigma and the role of the media in suicide prevention with professional associates and attend psychological first aid training.

Finally, UDG has embedded mental health within its broader human rights agenda. In 2021, the Office for Gender Equality was established to promote inclusivity and safeguard individual rights within the academic community. This office contributes to the university's overarching Action Plan (2022–2026), which envisions a supportive institutional environment. The plan includes provisions for psychological assistance to individuals facing harassment, the identification of UDG as a safe and nurturing space, and support for employees in balancing personal and professional responsibilities—all aligned with a broader commitment to cultivating a culture of care and psychological well-being.

### 3. PILOT PROGRAM OF THE UNIVERSITY OF DONJA GORICA

As already noted, the University of Donja Gorica actively promotes the concept of mental health through its teaching, practical work, forums, workshops, and educational initiatives—primarily targeting students. However, mechanisms for providing psychological support to academic staff remain underdeveloped, highlighting the need to systematically integrate mental hygiene practices into the broader academic environment.

In line with its commitment to student well-being, and in collaboration with the Axon Center for Mental Health (formerly the Association of Applied Psychology Students), the University has taken a significant step forward by officially opening a Psychological Counseling Center at the beginning of the 2024/2025 academic year. This Center provided a free, timely, and reliable counseling service over a two-week period, serving as a key resource for supporting students' psychological well-being. Through one-on-one sessions, students were given the opportunity to address personal challenges related to a range of psychological difficulties, further reinforcing the University's dedication to fostering a supportive and health-conscious academic environment. These sessions represent a cornerstone of UDG's strategy for fostering student well-being, and

their implementation reflects a significant step toward institutionalizing mental health care within the university system. The individual counseling service was available to all UDG students free of charge. Accessibility was a key feature: students could book sessions confidentially, either in person or via an online system, minimizing administrative and psychological barriers to seeking help. The counseling staff consisted of trained psychologists and therapists, associated with the University, who are equipped to work with a number of student concerns, including but not limited to anxiety, academic stress, depression, self-esteem issues, and interpersonal difficulties. Sessions typically lasted 50 minutes, with the option to continue working with the designated therapist after the two week project was over. The therapeutic approach adopted in these individual sessions was based on the principles of integration drawing from evidence-based practices such as Systemic Family Therapy, Cognitive-Behavioral Therapy, Person-Centered Therapy, and Solution-Focused techniques. This allowed counselors to adapt their methods to the unique psychological makeup and circumstances of each student. Importantly, the sessions were not framed merely as interventions for crisis situations but as opportunities for personal growth, emotional regulation, and improved academic performance principles that align with contemporary understandings of student mental health support.

UDG's model echoes several elements of best international practices. For instance, similar to systems implemented at leading universities across Europe, Canada, and Australia, UDG emphasizes early intervention, confidentiality, and a low-threshold access model. Furthermore, a unique cultural perspective in Montenegro was taken into account. Despite the increasing visibility of mental health discourse globally, in Montenegro, psychological counseling still faces notable cultural resistance. Traditional attitudes toward mental health in the region often frame emotional struggles as private matters, best kept within the family or managed independently. Seeking psychological help is sometimes viewed as a sign of personal weakness or instability, rather than a proactive and responsible step toward well-being. These stigmas, though gradually eroding, remain deeply rooted, especially among older generations and within more conservative communities. Within this context, justifying the presence of a university-based counseling center has not been without challenges. The initial perception among some students – and even some staff – was that psychological services were only for those in “crisis” or with “serious problems,” which could have discouraged many from approaching this service for early or preventative support. This hesitation was compounded by general unfamiliarity with therapeutic

processes and a lack of trust in confidentiality.

To address these cultural barriers, UDG's counseling team has taken an intentionally educational and destigmatizing approach. Trust-building was a central pillar of the service. It was regularly communicated - both through campus events and social media - that mental health is a normal, vital aspect of student life. Counselors emphasized that it is not only acceptable but encouraged to seek support for everyday stress, self-doubt, or emotional discomfort. These messages were carefully framed to reduce shame and normalize counseling as a strength, not a weakness.

#### 4. RESULTS AND DISCUSSIONS

Over time, this persistent effort had started to shift perceptions, since in 2024 a record number of students applied for counseling. More students now see counseling as a tool for personal development, not just crisis intervention. Feedback from students who have used the service indicates a positive impact. Many report improved emotional well-being, better focus in academic work, and increased confidence in handling interpersonal or family-related challenges. While quantitative data on outcomes is still being developed, the qualitative evidence suggests that these sessions did not only meet immediate psychological needs but also contributed to the cultivation of a more open, empathetic, and mentally resilient student culture at UDG.

Particularly, the results of the counseling work at the beginning of the winter semester indicated the need, that is, the necessity of a permanent psychological counseling center for students. During the individual sessions, numerous challenges faced by the students were identified: perfectionism, the need to please others, the impact of dysfunctional relationships within the primary family structure, as well as the need for emotional support and understanding. At the end of each counseling session, the participants have summarized the impressions from the individual sessions in order to better understand the specific needs of the students.

It is evident that, due to the fact that counseling help was most often requested by students in their first year of study, counseling work is of great importance in this period of adaptation. The beginning of studies is a challenging period that brings with it a number of stressors,

especially separation from the primary family and adaptation to a new educational and living environment. These are all factors that affect self-confidence and the appearance of anxiety, which is why many students have recognized university counseling as a good resource that can make this period of transition and adaptation more comfortable. Many students reported fearing that they would not be able to achieve all of their academic goals, which is often associated with high goals and perfectionism. With such topics, students appeared in search of techniques that would enable them to organize their time more efficiently, while the counseling enabled them to see the problem from a different perspective, to see their capacities and possibilities for dealing with the obligations they create for themselves, as well as the resources they have they can help overcome the stresses that go along with fulfilling those obligations (techniques for dealing with stress, a network of friends and so on).

A particularly significant aspect of this counseling work was represented by students who came forward with problems arising from dysfunctional relationships within primary families. For instance, within systemic family psychotherapy, the primary family is viewed as a key framework for personality development, the adoption of behavioral patterns, and the formation of internal psychological structures. Specifically, behavioral and cognitive-behavioral models within systemic approaches emphasize that early family interactions contribute significantly to the development of cognitive schemas, emotional responses, and relational behaviors that persist into adulthood (Epstein & Dattilio, 2020). The family acts not only as a source of support, but also as a system in which emotional patterns, values and dynamics are transmitted, often unconsciously, through generations. For young people aged 18 to 22, who are in early adulthood, these family dynamics can have a profound impact on their psychological development and functioning in a wider social context. This is the age when young people separate from the primary family and begin to build their own identity, while developing autonomy and responsibility. However, if family relationships are characterized by dysfunctional patterns such as conflicts, emotional neglect or excessive control, this can make this process significantly more difficult (Cohler, 1983; Beyers & Goossens, 2003; Arnett, 2000).

On the other hand, students saw the counseling work as a great resource that allowed them to share their story in a safe place and get rid of some of the burden they carry with them. Namely, students who were part of the counseling expressed their satisfaction that they had

the opportunity to receive support from a psychotherapist at the faculty. They recognized this activity as necessary and important for the student population, perhaps to the greatest extent in the first year of studies, when they face multiple challenges (new way of learning, separation from the family, adjusting to the peer group, high expectations from themselves or expectations from parents). In some situations, they were free to share family and personal challenges and to nominate them as something important to talk about. This is in favor of the fact that a relationship of trust and security has been formed between therapists and clients. An important feedback is that the need for continuous service and sessions as such within the University was expressed.

One-off consultations were important, although some of them continued after the mental health week, it is clear that establishing a permanent support service for students would have benefits for them, their achievements and satisfaction, and their mental health. It is an interesting fact that a certain number came as visitors, because they are personally interested in enrolling in some of the psychotherapy courses after completing their studies. The University, as a key environment where young individuals transition into adulthood and become educated, engaged members of society, holds a responsibility to address not only students' academic needs but also their overall well-being. This project has demonstrated that supporting students' mental health is not only essential but also feasible with adequate motivation and organizational effort. Feedback from participants further underscores the value of such initiatives, with students expressing strong support for the continuation and institutionalization of psychological services. Representative comments included: "This should be organized every year," "It is important that this becomes a permanent service for UDG students," and "It matters to students that the service is free and accessible without the need for referrals or long waiting times."

This initiative enabled students to develop new perspectives, recognize recurring emotional and behavioral patterns, and better understand the significance of psychological and emotional support. Owing to its accessibility and the visibility it gained through various promotional channels, the project successfully motivated some students to seek counseling—particularly those who might not have otherwise considered it. This highlights the critical role that accessible and well-promoted mental health services play in reducing stigma and encouraging help-seeking behavior. Notably, some students engaged with the service out of curiosity, wanting to learn more about the practice of counseling itself.

This points to an important secondary benefit of the initiative: beyond offering direct support during times of difficulty, it also served as a platform for mental health education and the promotion of a supportive, informed campus culture. The findings suggest a clear practical implication: students not only acknowledge the need for psychological services but express a strong preference for the availability of such support throughout the academic year. The growing interest in mental health initiatives among students reflects a positive shift in awareness and openness regarding mental well-being. A year-round counseling center would allow for more proactive engagement with students – supporting them before challenges escalate into crises. This project reinforces the notion that mental health care is not a luxury, but a vital and achievable component of student welfare and academic success. Furthermore, the deliberate choice to offer sustained, individualized counseling sessions rather than relying solely on workshops or group interventions demonstrates a recognition of the depth and complexity of personal psychological needs. Institutionalizing such services as a permanent offering for both students and university staff would represent a meaningful and sustainable investment in the academic community's overall health and resilience.

## 5. RESEARCH LIMITATIONS

While the qualitative feedback gathered through student participation in various mental health-related events provides valuable insight, the absence of a systematic statistical framework limits the depth and generalizability of the conclusions. In particular, the lack of empirical data – such as structured survey research assessing students' attitudes toward psychological counseling – restricts the ability to draw more comprehensive or nuanced inferences about student needs and service impact.

A further limitation lies in the temporal scope of the activities. Given the short-term nature of the counseling service, the findings offer only a partial understanding of its potential within the university ecosystem. A year-round counseling center would not only provide more consistent support to students but would also create opportunities for longitudinal research. This could involve tracking the outcomes of regular counseling over time and comparing data collected before and after a defined number of sessions –offering a more robust picture of the service's



long-term benefits and its integration into the academic environment. These limitations are not unique to this context. Despite increasing attention to student mental health across Europe, the specific impact of psychological counseling within higher education institutions remains a relatively underexplored area. One likely reason for this is the complexity arising from the intersection of various educational, healthcare, and institutional systems, as well as the still-developing need for a more holistic approach that explicitly recognizes the connection between mental health and academic life (Rückert, 2015).

## 6. CONCLUSION AND RECOMMENDATIONS

The findings of this paper highlight the crucial role of psychological counseling centers in supporting students' mental well-being. The case of the University of Donja Gorica (UDG) demonstrates that accessible psychological support services can provide significant benefits in addressing students' emotional and academic challenges. However, the analysis also reveals areas that require improvement, particularly in terms of service accessibility, awareness, and integration with broader university support systems.

Based on these insights, we would propose following recommendations for future instances:

Expanding outreach programs – Increasing efforts to promote the counseling center's services through workshops, social media, and collaboration with faculty can help reduce stigma and encourage students to seek support.

Enhancing accessibility – Offering flexible appointment scheduling, online counseling sessions, and multilingual support could ensure that all students have access to psychological assistance regardless of their circumstances.

Strengthening integration with academic services – Establishing closer cooperation between counseling services and academic departments can help identify students at risk earlier and provide holistic support tailored to their needs.

Continuous professional development for counselors – Providing ongoing training and adopting best practices from international counseling centers can enhance the effectiveness of psychological support at UDG.

Regular assessment and feedback mechanisms – Implementing systematic evaluations through student surveys and feedback loops can help refine and improve the quality of counseling services over time.

By implementing these recommendations, both UDG and other HEIs can further develop its psychological counseling services and serve as a model for other institutions aiming to improve student mental health support. Future research could explore the long-term impact of counseling interventions on student well-being and academic success, contributing to a broader understanding of mental health support systems in higher education.

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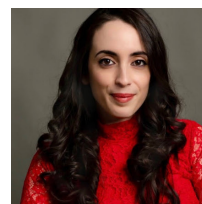
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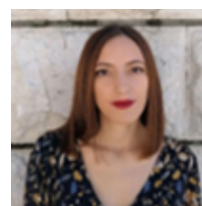
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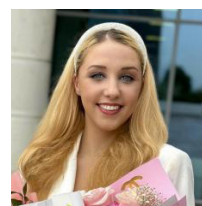
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# 4.

## THE NEW WORLD ORDER: HISTORICAL PATTERNS AND CURRENT US-CHINA DYNAMICS

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Ivan Piper, Aleksandra Gogic



# THE NEWWORLD ORDER: HISTORICAL PATTERNS AND CURRENT US-CHINA DYNAMICS

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## ABSTRACT:

The global order is inherently cyclical, shaped by the rise and fall of great powers over centuries. This paper examines the historical patterns of power transitions and their relevance to the evolving dynamics between the United States and China. Using Ray Dalio's cyclical theory of global power, the research explores the phases of ascent, dominance, and decline, juxtaposing the trajectories of past hegemons such as Britain and the Netherlands with the contemporary rivalry between the U.S. and China. The analysis highlights China's rapid ascent through economic reforms and strategic initiatives, contrasted with the United States' current challenges of internal polarization and external competition. Key questions surrounding the potential for a peaceful transition and the avoidance of the Thucydides Trap are addressed, underscoring the complexities of navigating multipolarity in the 21st century. This study provides insights into the geopolitical, economic, and cultural forces shaping the future of the global order.

**Keywords:** World order, United States, China, cyclical theory, geopolitics, Thucydides Trap, multipolarity

## 1. INTRODUCTION

The times ahead are likely to differ radically from those experienced by current generations, while simultaneously bearing striking similarities to periods in the past. Today, the world witnesses the rise of a new global power, China, poised to challenge the current leading economic superpower, the United States, and the existing world order (Dalio, 2021). However, a full understanding of the present developments and what lies ahead requires an analysis of analogous historical periods—specifically, the rise and fall of dominant global economic and political powers.

Ultimately, the current world order is facing a series of turbulent changes that will significantly impact its structure. Ongoing processes have reached an intensity reminiscent of historical events that have previously led to shifts in the world order. Chief among these are the increasing levels of national debt, internal conflicts within countries (including pronounced political polarization in the United States), the rise of populist movements clashing with one another, and external conflicts arising from the ascent of nations strong enough to challenge the existing global powers and order. Furthermore, natural disasters, climate change, and technological advancements, particularly the development of artificial intelligence, are additional factors influencing the world order. Each of these processes, and even more so their combined impact, is currently unfolding with a magnitude not seen since the period between 1930 and 1945, resembling the intensity of events that historically preceded significant shifts in the global order (Dalio, 2024).

Consequently, many of these processes, along with numerous others occurring concurrently, are likely to disrupt the current world order. As history demonstrates, when such processes unfold simultaneously and with high intensity, as they are now, there is a substantial probability of seismic changes affecting financial systems, internal structures of nations, and the global order itself. Therefore, cycles of rise, dominance, and eventual decline of great powers, deeply entrenched in history, offer a framework for understanding current geopolitical dynamics, particularly the shifting balance of power between the United States and China. Historically, the transition of power has rarely been peaceful, with emerging challengers often reshaping the norms, structures, and institutions of the prevailing order.



In the contemporary context, China's rapid economic growth and strategic initiatives, such as the Belt and Road Initiative, signal its ambitions to redefine global influence. Conversely, the United States, despite being the dominant global power for the past century, faces challenges from both internal divisions and external competition. This interplay of decline and ascent invites a critical examination of the factors shaping their respective trajectories and the broader implications for global stability.

This research seeks to analyze these dynamics through the lens of cyclical theories of power transitions, exploring the historical parallels and unique characteristics of the U.S.-China relationship. By integrating historical insights with modern data, the study aims to shed light on the unfolding realities of the 21st-century global order and contribute to a nuanced understanding of the strategies, challenges, and opportunities facing these two superpowers.

## 2. LITERATURE OVERVIEW

The foundation of this research draws upon a rich literature that examines the dynamics of global power transitions and the evolving world order. Ray Dalio's "Principles for the Changing World Order" provides a cyclical framework for understanding the rise and fall of global powers. Dalio identifies recurring patterns of ascent, peak, and decline among nations, emphasizing the interplay of economic strength, military power, and societal cohesion (Dalio, 2021). His insights are particularly relevant for analyzing the current shifts between the United States, the declining hegemon, and China, the emerging superpower.

Martin Jacques' in "When China Rules the World" challenges Western-centric assumptions about global leadership, arguing that China's resurgence will reshape international norms and values (Jacques, 2012). Jacques highlights the distinctiveness of China's cultural and historical identity, suggesting that its global influence will not mimic Western models but instead introduce new paradigms rooted in Confucian and collectivist traditions. This perspective complements Kishore Mahbubani's "Has China Won?", which delves into the strategic rivalry between the U.S. and China. Mahbubani argues that the West underestimates China's capacity for long-term planning and resilience, and he emphasizes the need for pragmatic engagement to avoid conflict (Mahbubani, 2020).

Parag Khanna's "The Future is Asian" broadens the discussion by positioning Asia, led by China and other rising powers, as the epicenter of the 21st-century global economy. Khanna advocates for recognizing Asia's diversity and interconnectedness, which he views as the driving force behind the region's ascendancy (Khanna, 2019). Similarly, Peter Frankopan's "New Silk Road" highlights the historical and contemporary significance of trade routes in shaping global power dynamics. Frankopan underscores China's Belt and Road Initiative as a modern iteration of these pathways, aimed at reclaiming its historical role as a central hub of global commerce (Frankopan, 2019).

Hamish McRae's "The World in 2050" projects the rise of Asia, particularly China and India, as dominant economic players, while also addressing the challenges posed by climate change, aging populations, and geopolitical tensions. According to his projections, unlike Asia, Europe is likely to lose significance in the decades to come. Its population will decline in absolute terms, and its economy in relative terms. The continent as a whole will increasingly resemble a museum of past successes rather than a laboratory of new ideas for the future (McRae, 2022).

Wang Jivei, in the book "China Connects the World", analyzes McKinsey's projections of the global economic center of gravity, which suggest that, after a thousand years, the world's economic center is returning to the East. Dominique Moïsi, in "The Geopolitics of Emotion", explains the premise that different emotions, or the cultural tendencies of certain nations and regions, carry broader significance and can thus influence the political, social, and cultural conflicts shaking the world. According to his analysis, the Asian world, led by China, is largely characterized by a culture of hope, while the Western world is marked by a culture of fear (Moïsi, 2012). Similarly, as noted by The Economist, architecture also reflects which countries are more ambitious and confident and which are losing these traits. This is particularly evident in the contrast between Asia, where countries compete to build the world's tallest skyscrapers, and Europe, whose relatively low buildings may symbolize a lack of ambition (The Economist, 2024).

Henry Kissinger's "World Order" provides a broader historical and philosophical context for understanding power transitions. Kissinger explores the challenges of maintaining global stability amidst competing visions of order, a theme that resonates with the U.S.-China rivalry. His emphasis on diplomacy and multilateral engagement offers valuable lessons for navigating the complexities of the current era. Possible



conflicts between the U.S. and China are discussed by Graham Allison in his book “Destined for War” and Čedomir Nestorović in “Geopolitics and Business”.

Together, these works form a multidisciplinary foundation for examining the historical patterns and contemporary realities of global power transitions, offering diverse perspectives on the evolving dynamics between the United States, China, and the broader world order.

### 3. METHODOLOGY OF THE RESEARCH

This research adopts a qualitative and comparative historical approach based on the Professor Veselin Vukotić’s “Time train” methodology. The “Time Train” methodology seeks to explore the roots of ongoing processes, their connections, networking, and convergence into the main thread that is traced through time. Therefore, this methodology aims to analyze the cyclical movement of time to uncover historical patterns that, like signposts along the road, can provide indications of what lies ahead and the direction in which the world is heading (Vukotić, 2023). Additionally, this research is grounded in the cyclical theory of global power dynamics as articulated by Ray Dalio, as well as Roel Sterckx. The study explores historical patterns of rise and fall among global powers and applies these insights to the current dynamics between the United States and China. The framework encompasses three primary phases of a nation's lifecycle—rise, peak power, and decline—further divided into six distinct stages, which provide a lens for analyzing past and present geopolitical shifts (Figure 1).

Data for this research were collected through a thorough review of primary and secondary sources, including academic literature, historical records, economic analyses, and policy reports. Key sources included Dalio's and Sterckx's cyclical model, historical case studies of major powers such as the Netherlands, Britain, and the United States, and contemporary data on China and the United States. Additionally, statistical data from international organizations and indices were used to evaluate economic performance, political stability, and societal trends.

The analysis employs a comparative framework to juxtapose the historical trajectories of previous global powers with the current positions of the U.S. and China. Each phase and stage of the cycles was examined through

key indicators, including economic growth rates, internal and external conflicts, institutional robustness, technological advancements, and global influence. Figures and visualizations, such as the cyclical stages diagram and economic trajectory graphs, were utilized to contextualize findings and highlight similarities and differences in the dynamics of rise and decline.

This methodology ensures a comprehensive and structured approach to examining the historical and current shifts in global power, aligning the research objectives with an analytical framework rooted in both theory and empirical evidence.

### 4. RESULTS AND DISCUSSIONS

#### 4.1 How the world order changes – cycles and phases

As Ray Dalio explains, all countries go through specific stages and cycles of rising and falling power, which leads to cyclical changes in the global order (Dalio, 2021). The cycle of rise and fall that nations and empires experience consists of three main phases—rise, peak power, and decline, as illustrated in Figure 1. Generally, a small percentage of the population initially gains control over a large share of wealth and power, becomes overburdened by excessive expansion, and then faces difficult times that disproportionately affect the least wealthy and powerful members of society (Sterckx, 2020). This ultimately leads to conflicts, revolutions, or civil wars. Once these conflicts conclude and a new world order is established, the cycle begins anew (Dalio, 2021). Currently, it is assumed that such a comprehensive shift in relative wealth, power distribution, and the global order is underway, potentially impacting individuals across all nations.

Cycles of the global order function like a pendulum, swinging alternately between opposites, such as war and peace, economic booms and busts, political shifts between the left and right, and the establishment and disintegration of empires. As the pendulum swings in one direction, it generates a reactive force that eventually pushes it back in the opposite direction (Dalio, 2021).

The three main phases of a nation's cycle can also be analyzed through the lens of six distinct stages:

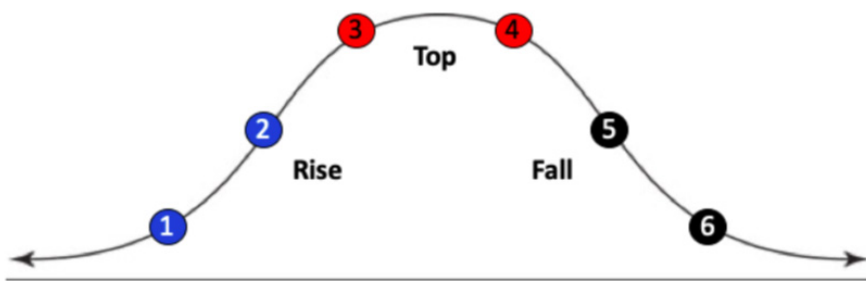


Figure 1. Three phases and six stages of the cycle (Dalio, 2021)

- **The first stage**, where new leadership consolidates power, leading to...
- **The second stage**, where the government implements a series of programs and reforms, which, if effectively executed, lead to...
- **The third stage**, marked by a period of peace and prosperity, which leads to...
- **The fourth stage**, characterized by excessive spending and government borrowing, along with increasing inequality between the rich and poor, **leading to...**
- **The fifth stage**, marked by financial crises and intense conflicts, leading to...
- **The sixth stage**, characterized by civil wars and uprisings, leading back to...
- The first stage, initiating a new cycle (Dalio, 2021).

The stage or phase in which a country finds itself relative to others can potentially influence the relationships between these countries and, consequently, the global order. In the following sections, an analysis will explore the current phases and stages of the world's leading economic power (the United States) and its primary rising rival (China), as well as their mutual relationships and the potential consequences of these dynamics in the future. However, to fully understand what is happening now and what may happen in the coming years, it is essential to first

examine similar historical cases. Thus, the following section provides an analysis of the global order and its historical changes.

## 4.2 How the world order has changed throughout history?

As illustrated in Figure 2, leading global powers, such as the Netherlands, Great Britain, the United States, and China – have historically undergone cycles of ascent and decline, as analyzed in the previous section. In other words, each leading global power have experienced a period of ascent followed by a relative decline in their economic power and global position.

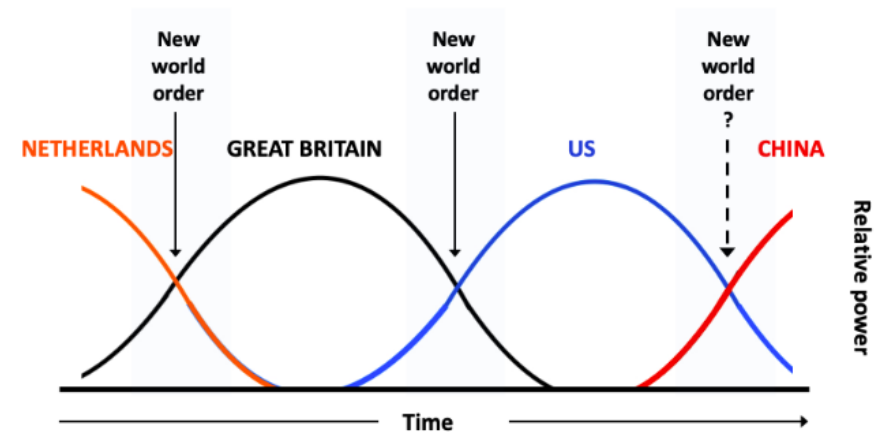


Figure 2. Changes in the world order throughout history

China, for centuries the dominant global economic force, maintained its leadership through innovation, trade, and a meritocratic system until the 19th century, when it faced a rapid decline due to internal instability and conflicts with European powers. Similarly, the Netherlands, under Spanish Habsburg control, gained de facto independence in 1581 and rose to become the world's leading economic power during its Golden Age around 1650 (Dalio, 2021). This success was driven by innovations like efficient ships for global expeditions, capitalism, and openness to new ideas. The Dutch East India Company dominated global trade, and the nation's per capita income surpassed most European countries. The Peace of Westphalia in 1648 solidified Dutch independence and ushered

in a new world order. However, overextension, internal financial crisis, the Industrial Revolution and Britain's rise weakened Dutch dominance by the mid-18th century, marking a shift in global power to Britain and France (Kissinger, 2014).

Britain's ascent was built on institutional reforms, including the Magna Carta and Enlightenment ideals, which fostered parliamentary governance and economic innovation (Acemoglu, Robinson, 2013). The First Industrial Revolution cemented Britain's global dominance, but the Second Industrial Revolution gave rise to new competitors, particularly the U.S. and Germany. By the 20th century, Britain faced challenges in maintaining its vast empire, which, coupled with rising debt and increasing competition, led to its decline (Dalio, 2021).

The United States emerged as the dominant global power following World War II, creating a new world order through institutions like NATO, the United Nations, and the Bretton Woods system (Dalio, 2021). Its rise, rooted in the Second Industrial Revolution, was further accelerated by the economic benefits of World War I and the relatively unscathed position it held after World War II (Kissinger, 2014). The U.S. dollar became the leading global reserve currency, and despite Cold War challenges, the U.S. maintained its supremacy, particularly after the Soviet Union's collapse in 1991. However, globalization, China's resurgence, and financial crises in 2000, 2008, and 2020 have gradually shifted global dynamics, signaling a transition in the world order and challenges to American supremacy (Dalio, 2021).

Throughout most of history until the 19th century, China was the world's leading economy, driven by innovation, trade, and a meritocratic system. Despite cycles of dynastic rise and fall, China's cultural and institutional resilience sustained its global prominence (Jacques, 2012). However, China's supremacy was disrupted by internal strife, natural disasters and external conflicts, notably the Opium Wars, which ushered in a "century of humiliation", which led to economic and political decline (Dalio, 2021). Currently, the U.S. is experiencing a relative decline in power, while China is once again on the rise. Its resurgence began in the 20th century under Mao Zedong, who established foundational institutions, and accelerated with economic reforms under Deng Xiaoping, which opened China to the global economy and transformed it into a global powerhouse (Jacques, 2012). Today, under Xi Jinping, China is positioning itself to reclaim its status as a leading global power, implementing ambitious initiatives like the "Belt and Road" and creating multilateral institutions (Mahbubani,

2020). As tensions between China and the U.S. rise, the future of the world order hinges on their ability to adapt to shifting dynamics and address emerging challenges.

The waning era of globalization and peace has given way to increasing conflicts, both domestically within nations and between the U.S., the established power, and China, the ascending challenger. Key questions remain: Can China navigate the challenges of the post-COVID-19 world and sustain its ascent? How will the U.S. respond to unprecedented challenges to its dominance? The subsequent analysis will explore the current stages of the cyclical dynamics for both nations, their strengths and vulnerabilities, and the broader trends shaping the evolving world order, and the nature of relations between these two nations.

### 4.3 In which phases of the cycle are the US and China currently?

This section of the research analyzes the current stages of the cycles in which the United States and China are situated, their primary strengths and weaknesses, and the trends anticipated in the coming period. Accordingly, Figure 3 illustrates the phases and stages of the cycles these two countries are currently in:

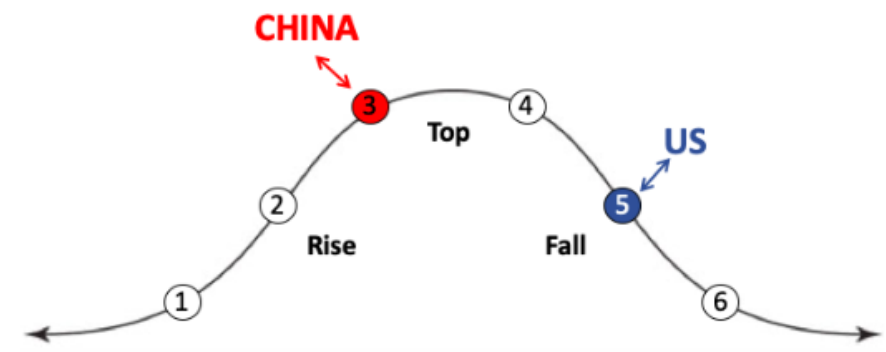


Figure 3: Phases of the Cycle for China and the U.S.

According to Ray Dalio's research, the United States is currently the leading global power but is undergoing a gradual decline in its dominance. Based on Dalio's model, the U.S. is at approximately 70% (+/- 10%) through the cycle that nations follow from their rise to their fall (Dalio, 2021). In

other words, the U.S. is currently in a declining phase, specifically the fifth stage of the cycle. It has not yet entered the sixth stage, which involves civil war or revolution and active conflicts, but internal tensions are high and continue to grow. The primary strengths sustaining the U.S.'s position include its developed capital markets, innovation and technology, high levels of education, a strong military, the dollar's status as the reserve currency, and substantial economic output. However, its weaknesses lie in an unfavorable economic and financial position and heightened internal divisions.

For the U.S., the cycles and stages it is currently navigating appear challenging. Economically and financially, the U.S. faces significant difficulties, including high levels of debt and a low projected annual economic growth rate over the next decade (1.1% annually) (Dalio, 2021). Internal conflicts represent a major risk, measured by the frequency of protests, political disputes, and general public dissatisfaction. External conflicts also pose risks, particularly due to tensions with Russia over the war in Ukraine and with China over worsening relations in recent years, including the Taiwan issue. Additionally, the financial and broader costs of U.S. support for Ukraine in the war against Russia and for Israel in its conflict with Hamas could further weaken the U.S., both economically and otherwise, potentially exacerbating domestic conflicts over key national issues.

On the other hand, the United States boasts the largest capital market and the most developed financial center among leading nations. It is also a global leader in technology and innovation, evident in its share of global patents (17%), research and development investments (26%), and the proportion of global researchers originating from the U.S. (26%). Furthermore, the U.S. ranks highest among leading nations in education, with a significant share of global graduates (20%) (Dalio, 2021).

China, meanwhile, is currently the world's second-leading power and is experiencing rapid ascent. As shown in Figure 3, China is presently in the third stage of the cycle, with an expectation that its rise will continue. China's primary strengths include a favorable economic and financial position, robust infrastructure and investments, a critical role in global trade, high economic output, a strong work ethic among its population, high education levels, and a powerful military.

According to Ray Dalio's model, China's cycles and stages appear favorable. Economically and financially, China is well-positioned, with a

projected average annual economic growth rate of 4.3% over the next decade (Dalio, 2021). While internal conflicts represent a moderate risk, external conflicts, particularly the deteriorating relationship with the U.S., pose a greater challenge. China is the largest exporter among leading nations, accounting for approximately 14% of global exports, and it has the largest economy by purchasing power parity. Additionally, after the U.S., China ranks second in education, with 22% of global graduates coming from the country (Dalio, 2021).

When comparing internal conflicts, the U.S. faces significantly higher levels, currently in the fifth stage of the cycle (characterized by unfavorable financial conditions and internal strife), while China appears to be in the third stage (marked by peace and prosperity). However, such dynamics can shift rapidly, as seen in events like the Arab Spring, the Hong Kong protests, the war in Ukraine, and internal conflicts in Syria, Afghanistan, Peru, and Chile. These events have led to revolutionary changes in the internal order of the affected nations.

Although it seems unlikely that the U.S. will enter the sixth stage of the cycle (civil war) within the next decade, research estimates a 30% probability of such an event, which represents a significant risk that requires mitigation (Dalio, 2021). One major indicator of this potential trajectory is the current high level of polarization and division among the American population. Research shows a pronounced animosity between Republicans and Democrats across various dimensions, with nearly half of Americans unwilling to marry someone from the opposing party. By comparison, in 1960, only 5% of individuals from either party held such views (Dalio, 2021). The 2020 and 2024 presidential elections further highlighted the depth of division in American society, with nearly an even split in the vote (The Economist, 2024). Fifty years ago, the majority of Americans were moderates, while extremists were less extreme. Today, there is a far higher concentration of individuals at the political spectrum's extremes. History suggests that heightened polarization can lead to political gridlock (e.g., when the opposing party controls either the Senate or the House relative to the president's party) or, in extreme cases, to some form of civil war or revolution (Dalio, 2021).

On the other hand, the United States has one of the most enduring and respected internal systems, embodied in its constitutional framework. This makes it less likely for Americans to abandon their established order, but should such a shift occur, the consequences would be far more profound.

While it is uncertain whether internal conflicts in the U.S. will worsen or subside, long-term trends suggest a momentum toward greater societal division, presenting a significant risk. Increasing national debt, weakening global influence, and severe internal and external conflicts should be a cause for concern not only for the U.S. but also for nations that depend on its stability. However, over nearly two and a half centuries, the U.S. has demonstrated an extraordinary ability to adapt without reaching a breaking point. The fundamental challenge for America remains internal: Can its population stay united, or will internal divisions continue to erode its global power?

Underestimating the U.S. would be a grave mistake. For instance, historical experiences have instilled in Chinese society a deep fear of chaos, which has repeatedly brought China to its knees throughout history (Mahbubani, 2020). While America is currently grappling with its own version of chaos, marked by significant political polarization, this chaos represents a form of strength. It stems from vigorous debates among its citizens about the nation's future direction—a reflection of their belief that the country belongs to them, not the government. This sense of ownership fosters an emphasis on the individual, contrasting with China's cultural preference for social harmony over individual empowerment (Mahbubani, 2020).

This emphasis on individualism has allowed the U.S. to produce some of the most influential and powerful individuals globally. In many societies, those who stand out are criticized or suppressed by either the government or their community. A Chinese proverb states, "The wind bends the tallest tree first," implying that prominent individuals are targeted (Mahbubani, 2020). In contrast, Americans celebrate "tall trees," with figures like Bill Gates, Steve Jobs, Jeff Bezos, and Elon Musk revered despite the controversies their companies may face (Mahbubani, 2020). No society fosters a more robust ecosystem for nurturing exceptional individuals than America.

The question is whether China can replicate such a system. For example, China's resurgence after a century of stagnation is attributed to the leadership of a singular figure like Mao Zedong. However, American society produces many Mao Zedongs (Mahbubani, 2020).

Another strategic advantage for the U.S. is its ability to attract the smartest and most capable individuals from around the globe. While China, with its population four times larger than the U.S., theoretically has access to a

larger talent pool, as Lee Kuan Yew pointed out, America's unparalleled capacity to draw top global talent gives it an edge (Mahbubani, 2020). Many CEOs of major American companies are immigrants who moved to the U.S., whereas China's companies and institutions are almost exclusively led by those born within the country. Additionally, the U.S. boasts some of the world's best universities, which attract high-potential talent from across the globe to live and thrive in America.

Another potential advantage of the United States lies in its strong institutions. While individualism is encouraged and celebrated, American society does not rely on powerful individual leaders but rather on robust institutions (Mahbubani, 2020). For instance, the President and Congress hold significant power, but their authority is checked by other institutions, such as one of the world's freest media landscapes and the Supreme Court. Consequently, in the U.S., the rule of law is more powerful than the government in power at any given time (Mahbubani, 2020).

If China's rise and America's decline continue, the most pressing question is whether both countries can manage this transition gracefully. When irreconcilable differences exist and there is no mutually agreed-upon process for resolving conflicts, the risk of confrontation between the two nations increases significantly. Therefore, the question is: can the U.S. and China avoid falling into the "Thucydides Trap", where a rising power challenges an established hegemon? As Čedomir Nestorović points out, "no one expects the United States to use military force against China, but an armed conflict is not the only type of conflict that exists" (Nestorović, 2024). Conflicts can also take the form of trade wars, technological battles, geopolitical struggles, and, uniquely for the U.S. and China, a "cultural war" (Dalio, 2021). These conflicts unfold to varying degrees—some are already in advanced stages, others risk deepening in the near future, and collectively, they could lead to military confrontation.

Currently, the main and seemingly irreconcilable issues between the U.S. and China revolve around the trade war and Taiwan. These two issues are the most immediate flashpoints that could potentially lead to a direct conflict between the world's two leading powers, while, in the long term, North Korea might emerge as an additional point of contention. As Graham Allison writes in his book *Destined for War*, over the past 500 years, when two states of nearly equal strength faced seemingly unresolvable differences, war occurred in 12 out of 16 cases (Allison, 2017). Similarly, a Harvard study found that war broke out in 10 out of 15 such historical instances (Kissinger, 2014). However, the likelihood of war today is



lower, as an open conflict could potentially lead to mutual destruction due to the use of nuclear weapons. Moreover, China's rise does not entail America's fall – both countries can grow simultaneously, though perhaps not in the same proportion (Nestorović, 2024). Nonetheless, the risk remains. Ultimately, avoiding the "Thucydides Trap" is desirable for all parties involved, but it does not guarantee a "happy ending". The rivalry between these two nations is here to stay and will not disappear quickly. Therefore, it requires a cautious and long-term approach.

Ultimately, considering the current stages of the cycles in which the United States and China are situated, one critical question arises: Is the world order undergoing only a perceived change, or is this truly a transformative process signaling a new reality?

#### 4.4 Hierarchical world order or a community with a shared future?

At the heart of any discussion about China's future role in the world, particularly regarding the "Chinese Century," lies the nation's economic prospects. China's economic growth and development are expected to remain the driving force behind its rising global influence (Kroeber, 2016). However, the economic impact is just one part of the broader picture, as China's political and cultural influence will also play a pivotal role in shaping the global landscape over the next several decades. While economic growth rates are expected to slow, China's continued ascent as a global power is anticipated.

Historically, economic strength alone has not guaranteed global dominance. The transition from being the largest economy to becoming a global superpower requires technological capabilities and effective political positioning. For instance, while China was the world's largest economy in the early 19th century, its global influence was limited due to technological backwardness. Similarly, the United States became the leading economy in the 1870s but only emerged as a superpower post-World War II (Kroeber, 2016). Drawing from these lessons, China's future influence will depend not only on its economic size but also on its technological innovation and geopolitical strategies.

Michael Wood outlines three pillars for China's continued rise: the enduring dominance of the Communist Party, sustainable economic

growth, and the promotion of China's historical and cultural significance (Wood, 2020). China's economic trajectory suggests that its economy could surpass that of the United States by 2030 and potentially double by 2050 (Jin, 2023). This growth is evident in China's leadership in global trade, investments through the Belt and Road Initiative, and its role as a major financier of international projects. Additionally, China is transitioning from being a nation of imitation to one of innovation, as evidenced by its dominance in global patent filings and research output.

As China solidifies its global role, its influence will extend beyond economics to reshaping narratives and concepts that dominate global history. The rise of China could mark a shift from a predominantly Western narrative to a more inclusive global history where Chinese achievements, such as the Qin dynasty's unification or Emperor Qin Shi Huang's reign, gain worldwide recognition (Jacques, 2012). This could redefine global concepts, from political systems to cultural norms, emphasizing unity over fragmentation and a civilization-state model over nation-state paradigms.

China's massive population will further amplify its influence, making it the world's largest market and boosting the prominence of the Chinese language. As China's global economic integration deepens, the Chinese language is likely to gain traction as a lingua franca, particularly in East Asia, where China's economic clout is undeniable (Jacques, 2012). However, whether this linguistic spread can match the global reach of English remains uncertain.

China's ascent is likely to bring about significant geopolitical changes, including Beijing potentially becoming the world's leading city, East Asia emerging as the most critical region, and Asia as the dominant continent (Jacques, 2012). This shift may also see the return of a modernized tributary system, where neighboring countries increasingly align with China's economic and cultural influence. While such dynamics may be less likely in Western nations, they could shape China's relationships with Africa, Central Asia, and Latin America.

The rise of China also introduces a distinct model of capitalism, blending Western practices with Chinese cultural and political traditions. This unique system contrasts with Western democracy, emphasizing centralized governance alongside economic openness. While future political reforms may reshape China, these reforms will likely reflect its Confucian heritage rather than adopting Western democratic models

outright (Jacques, 2012).

China's growing power combines political, economic, cultural, and military dimensions. Its influence as a global hegemon will depend on its ability to project a compelling vision that other nations accept. However, significant challenges remain, including demographic shifts, slowing economic growth, and potential internal instability. The one-child policy has led to an aging population, reducing the workforce and straining public finances, with projections suggesting a significant decline in population by 2060 (French, 2018).

Nevertheless, the world stands at the initial stages of a global "Asianization", raising numerous questions about the direction it will take in the coming decades. How will Asia navigate this wave of geopolitical, economic, social, and technological transformation? Will mixed capitalism, social conservatism, and technocratic governance remain the magic formula that propels societies yet to adopt it? How will Western and other global powers respond to Asia's rise, and how will Asia adapt to these reactions (Khana, 2019)?

A new chapter of global history is being written, one where Asian and Western civilizations, North America, and Eurasia all play crucial roles. Today, the West advocates for a "rules-based global order", while Asians often prefer China's phrase, "a community with a shared future". It will soon become clear that both perspectives are two sides of the same coin—rules and futures must be shaped collectively (Khana, 2019).

After more than 200 years of Western economic dominance over the rest of the world, the global order is reverting to something resembling the historical equilibrium among civilizations. From the 1st to the 19th century, China and India were consistently the world's largest economies (Mahbubani, 2020). Now, as parts of Western civilization (especially Europe) appear fatigued and lack the vitality of previous centuries, other civilizations (notably in Asia) are gaining momentum. In this context, human civilizations—and the global order itself—resemble living organisms, undergoing cycles of growth and decline, as demonstrated in earlier sections of this research. China, in particular, stands out as the only ancient civilization to have fallen four times and risen again (Mahbubani, 2020).

One reason the West may struggle to maintain its global dominance is that the world has learned extensively from it. Many countries have adopted

Western practices in economics, politics, science, and technology. China's cultural confidence, built over centuries, combined with what it has learned from the West, provides it with unique strength and energy in its economic ascent (Mahbubani, 2020).

At its core, the global order revolves around the distribution and management of power. As Parag Khanna argues, the leader of the global order need not be a single nation or set of values, as was the case with the Western liberal international order (Khana, 2019). Instead, the foundation of the new global order could include systems from America, Europe, and Asia - all simultaneously. Each offers critical global services, such as military protection, investment, and infrastructure development. Rather than one declining superpower being replaced by another, humanity is entering a genuinely multipolar and multi-civilizational order where North America, Europe, and Asia share power. Consequently, Asia may not simply replace America or the West, but will influence them just as the West has influenced Asia. While China is a superpower, its rise is likely to reinforce global multipolarity rather than replace it (Khana, 2019).

Power is difficult to measure simply by comparing metrics or parameters. For example, the U.S. remains the leading global military power, with the most advanced financial markets and the largest energy production. Europe leads in market size, the quality of democratic institutions, and overall living standards. Asia, particularly China and India, boasts the largest populations and militaries, the greatest savings propensity, and the largest foreign exchange reserves. Each region possesses different types, amounts, and geographies of power, leaving no definitive answer as to who is "number one" (Khana, 2019).

As Khanna points out, just as geopolitical forecasters attempt to determine the current or future "number one" many fall into the trap of oversimplifying the world as a "G2" governance system, dominated by America and China competing for global supremacy (Khana, 2019). However, neither the world as a whole nor Asia as a region is moving toward China's tianxia—a harmonious global system governed by Confucian principles (Khana, 2019). While China wields considerable power, its population is expected to peak by 2030. Of Asia's roughly 5 billion people, 3.5 billion are not Chinese (Khana, 2019). Additionally, challenges such as China's debt, demographic issues, and the impact of the COVID-19 pandemic may shift global attention toward other Asian countries and regions that are more open to Western goods and ideas.

The broader picture shows that China accounts for one-third of Asia's population, less than half of Asia's GDP, about half of its investments, and less than half of its outbound investments. As Khanna notes, Asia is far more than just China, and Asia's future extends well beyond China's ambitions (Khana, 2019).

Asia dominated the old world, while the West dominated the New World. Now, "we are moving toward a truly global world", (Khana, 2019). Never before has there been a global system so deeply interconnected with multiple civilizations, regions, and centers of power spanning all continents. This global order implies that the success of individual nations depends on the degree of globalization among all countries shaping the world order. Thus, "we can expect a synthesis in all areas of life between the West and the East: Western atomism and Eastern holism, humanism and scientific materialism, freedom and harmony, democracy and technocracy - creating a richer experience for all of humanity" (Khana, 2019).

In conclusion, the 21st century may well be regarded as the "Chinese Century". Yet, China's ascent will not mirror Western imperialism – instead, it will reflect its unique historical and cultural identity. The path ahead is complex, requiring China to navigate internal reforms and global expectations while shaping a new global order characterized by diversity, competition, and coexistence. However, while China's rise challenges the West, it does not necessarily mean the end of Western influence. Instead, the global order is likely to become multipolar, with competing norms and values. This competition will challenge Western universalism, fostering a world where no single country holds the dominance that Western nations enjoyed for centuries. Ultimately, the key question is not whether China or the U.S. will prevail, but whether humanity as a whole will triumph.

## 5. RESEARCH LIMITATIONS

This research provides a comprehensive analysis of historical and contemporary shifts in global power dynamics. However, several limitations must be acknowledged. While the cyclical theory provides a robust foundation for analyzing global power transitions, its application is constrained by the complexity and uniqueness of each historical and contemporary context.

The study is primarily based on cyclical theory of global power transitions, which, while insightful, remains a generalized framework. Its applicability may vary across different historical contexts, and certain nuances of individual nations' trajectories may not align perfectly with the proposed cycles and stages. Additionally, reliance on qualitative historical interpretation and the lack of quantitative modeling limits the predictive precision of the study.

Moreover, given that analysis of the current U.S.- China dynamics is based on the latest available data and trends, geopolitical and economic circumstances are evolving rapidly, making it challenging to account for unforeseen developments, such as global conflicts, pandemics, or shifts in international alliances.

## 6. CONCLUSION

The dynamics of global power are in constant flux, shaped by the cyclical rise and fall of dominant nations. This research illuminates the intricate patterns of these transitions, offering a lens through which the current U.S.- China rivalry can be better understood. The United States, despite facing internal polarization and external challenges, remains a global leader in innovation, finance, and institutional robustness. Conversely, China's rapid ascent, marked by economic growth, technological innovation, and strategic initiatives like the Belt and Road, underscores its ambition to redefine global norms and influence.

The historical parallels drawn from past powers reveal that transitions are rarely peaceful or linear. While the cyclical theory offers valuable insights, it also emphasizes the unpredictable nature of such shifts. The interplay between America's internal divisions and China's external ambitions will significantly shape the emerging world order. The potential for conflict, whether in the form of trade wars, technological competition, or geopolitical tensions, underscores the fragility of this transition.

Ultimately, the evolving world order may not signal a complete replacement of the West by the East, but rather a move toward a multipolar framework. This structure, characterized by shared influence and competing values, has the potential to foster a more balanced and inclusive world. However, such an outcome depends on the ability of nations to navigate their differences through diplomacy and mutual



respect, avoiding the pitfalls of historical conflicts.

This research has raised numerous new questions for further analysis: What is the role of China's Belt and Road Initiative in shaping the new world order? Will the encounter between Western and Eastern cultures lead to a clash or to their unification? How will this affect business operations and collaboration between American and Chinese companies? Is it possible to establish Eurasia as a unity of cultural diversity, and can the Belt and Road Initiative contribute to this vision? However, as humanity stands at the crossroads of transformation, the pressing question remains: can the lessons of history guide us toward a cooperative and sustainable global future? This research calls for continuous analysis, as the outcomes of this transition will resonate far beyond the current century, shaping the trajectory of international relations for generations to come.

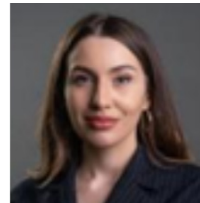
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## THE NEED FOR HOLISTIC APPROACH IN EDUCATION





# THE NEED FOR HOLISTIC APPROACH IN EDUCATION

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## ABSTRACT:

The complexity of modern global challenges underscores the need for a holistic approach in education that fosters interdisciplinary learning, critical thinking, and adaptability. This study explores the theoretical foundations and practical applications of holistic education while addressing the barriers posed by bureaucratic structures in higher education. A mixed-methods approach was employed, combining a literature review with an empirical survey conducted among students of the Economics and Development course at the University of Donja Gorica (UDG), designed by Professor Veselin Vukotić. The results highlight the effectiveness of interdisciplinary teaching methods in enhancing students' understanding of complex subjects and their professional applicability. The findings also reveal that while holistic education offers

significant benefits, its implementation is hindered by bureaucratic rigidity, which stifles innovation and limits integrative learning. By advocating for a paradigm shift that prioritizes interconnected knowledge and creativity, this paper contributes to the ongoing discourse on educational reform and emphasizes the need to balance specialization with a broader, multidisciplinary perspective.

**Keywords: Holistic approach, interdisciplinary learning, higher education reform, bureaucracy, multidisciplinary teaching, critical thinking, educational innovation**

## 1. INTRODUCTION

Education, as the cornerstone of societal development, must evolve to meet the complex challenges of the modern world. The traditional, compartmentalized approach to learning, where disciplines are taught in isolation, increasingly proves insufficient in equipping students with the skills and perspectives needed to navigate a rapidly changing global landscape. A holistic approach to education, emphasizing multidisciplinary, interconnectedness, and critical thinking, offers a promising alternative by fostering the development of well-rounded individuals capable of understanding and addressing multifaceted societal and professional challenges.

However, despite its potential, the implementation of holistic education faces significant obstacles. One of the primary barriers is the rigid bureaucratic structures that dominate educational institutions. These structures often prioritize standardization and compliance over innovation and creativity, stifling attempts to adopt more integrative and dynamic teaching methodologies. Bureaucracy, while necessary for organization and governance, can become a hindrance when it undermines the flexibility and responsiveness required for holistic educational practices.

This paper explores the need for a holistic approach in education by examining its theoretical foundations, challenges, and practical applications. An analysis of existing literature highlights the benefits of multidisciplinary in fostering critical thinking, creativity, and a broader

understanding of global issues. Additionally, the paper investigates the detrimental effects of bureaucracy on education, particularly its role in limiting the adoption of innovative teaching practices.

Empirical evidence is drawn from a case study involving students of the Economics and Development experimental course, created and taught by Prof. Veselin Vukotić, PhD and group of assistants at University of Donja Gorica, where a multidisciplinary teaching approach was employed. Through a survey, students were asked to evaluate the usefulness of this approach in enhancing their understanding of complex economic and cultural interconnections. Their responses provide valuable insights into the practical implications of holistic education in a real-world academic setting.

By addressing both the opportunities and challenges associated with holistic education, this paper seeks to contribute to the ongoing discourse on educational reform, advocating for a paradigm shift towards approaches that prioritize interconnected knowledge, creativity, and adaptability over rigid bureaucratic constraints.

## 2. LITERATURE OVERVIEW

A holistic approach to education is increasingly becoming a key topic in the context of higher education, emphasizing the need for learning that not only develops professional and academic competencies but also promotes the spiritual, social, and ethical growth of students. This approach integrates various dimensions of personal and professional development, preparing students to face the complex challenges of modern society and the global labor market. Consequently, the following provides a review of works that examine the necessity and significance of holistic education in academia.

The holistic approach to education draws its roots from various philosophical schools of thought, both Western and Eastern. The earliest advocate for a holistic approach to education in Western philosophy is often considered to be Plato. In his seminal work, *The Republic*, Plato outlines an educational framework aimed at cultivating the "whole person", integrating the intellectual, physical, and moral dimensions of human development. His ideas laid the foundation for later philosophical discussions on education that value the interconnectedness of knowledge

and the comprehensive development of individuals. On the other hand, Eastern philosophical schools such as Confucianism and Taoism also emphasize the importance of a holistic approach in everyday life, and consequently in education. Confucianism focuses on moral development, harmony in interpersonal relationships, and the integration of the learner into the community, while Taoism promotes balance, intuitive learning, and a connection with nature.

Theoretical foundations of holistic education rely on the works of Dewey (1916), who emphasized the importance of experiential learning, the connection between theory and practice, and the active participation of students in the educational process, as well as the humanistic psychology of Rogers (1961) and Maslow (1943), which stressed the importance of emotional and psychological development in learning. In the context of higher education, Barnett (2007) highlights the need for "transformative education" that fosters critical thinking, ethical responsibility, and the ability to act under uncertain and changing conditions.

Interdisciplinary learning represents a key component of holistic education, enabling students to develop the ability to connect knowledge from different fields to solve complex problems. Studies such as Klein (2010) emphasize that interdisciplinary courses in higher education enhance critical thinking and the ability to link various domains of knowledge. This approach allows students to analyze complex social and economic issues from multiple perspectives. Repko (2012) argues that interdisciplinarity involves integrating not only content but also various epistemological frameworks, enabling students to better understand complex phenomena. Newell's (2007) work highlights the importance of interdisciplinarity in addressing "wicked problems"—those with no simple solutions, such as sustainable development or global economic crises.

Friedrich Hayek's "The Fatal Conceit" highlights the limitations of centralized systems and bureaucratic rigidity, which stifle innovation, adaptability, and interdisciplinarity—essential elements of holistic education. His critique of over-specialization and emphasis on spontaneous order align with the principles of holistic education, promoting integration across disciplines and adaptability to diverse challenges. Furthermore, Hayek's belief in freedom as a driver of creativity and innovation reinforces the need for flexible educational models that empower students to explore and connect knowledge beyond rigid institutional frameworks. These insights offer a philosophical foundation for critiquing bureaucratic barriers to holistic education and support the

adoption of more integrative and dynamic approaches.

Professor Veselin Vukotić has made significant contributions through his works to understanding the need for a holistic approach in higher education, particularly by analyzing the role of universities as spaces for fostering creativity, innovation, and interdisciplinary thinking. In his book "The Marketplace of Ideas" (2007), Vukotić emphasizes the importance of universities as "marketplaces" where diverse ideas converge and transform, creating an environment that encourages individual growth and the development of critical thinking among students. Furthermore, in his work "The University for the Third Millennium" (2012), he examines the changing role of higher education institutions in contemporary society, pointing to the need for education to focus not only on knowledge acquisition but also on fostering values, entrepreneurial spirit, and adaptability to change. According to Vukotić, integrating various disciplines and teaching approaches is essential for preparing students to tackle the complex challenges of the modern world.

Although there is clear evidence of the benefits of holistic education, the challenges of its implementation in higher education remain significant. Barriers include a traditional focus on academic outcomes, a lack of adequate teacher training, and resource constraints (Fullan, 2007; Zhao, 2012). Moreover, cultural differences in the perception of educational priorities present an additional challenge in international academic communities. However, one of the fundamental obstacles to a holistic approach in education is bureaucracy (Harari, 2024).

### 3. METHODOLOGY OF THE RESEARCH

This study employs a mixed-methods approach to explore the need for a holistic approach to education, focusing on the perspectives of students enrolled in the course Economics and Development, created and taught by Professor Veselin Vukotić and group of assistants. The course is based on the study model  $S=Z \cdot i^2$  developed by Professor Veselin Vukotić, which fundamentally reflects a holistic approach to the student's life at the University of Donja Gorica.<sup>1</sup> The goal of the model is to highlight the methodology, organization of teaching, and research at UDG, which ultimately aims to produce a student who is an "expert in uncertainty" (Vukotić, 2020). The model seeks to answer the question

of how a student's knowledge can be converted into their practical ability, by investing in student's life experience. Therefore, it is based on the premise that knowledge alone does not equate to capability. In education, it is essential to connect parts and details—not mechanically, but holistically—through processes that are natural and organic. In other words, it requires the cognitive integration of "details" into the context of a greater whole. This approach emphasizes the need for systemic, interconnected thinking that fosters a comprehensive understanding and application of knowledge (Vukotić, 2020).

The research integrates qualitative and quantitative data collected through a survey questionnaire and supplemented by a literature review on the subject. The Economics and Development course is divided in three different lecture blocks – the first two blocks of the class is taught by Professor Veselin Vukotić and group of professors, while the third block of the class is designed for students aiming for grades 9 and 10, and is organized by a group of teaching assistants who conduct lectures and workshops across various fields to nurture a multidisciplinary approach in working with students. The target population for this study consisted of group of university students attending the third block of Economics and Development course, taught by the authors of this paper. The group consists of students from various faculties and disciplines, ensuring diversity in educational backgrounds and perspectives. The survey was distributed to students after completing the course module.

The primary data collection tool was a structured questionnaire designed to capture students' perceptions of the interdisciplinary and holistic teaching methods employed in the course. The questionnaire included both closed-ended and open-ended questions, covering the following areas:

- **Perceived usefulness of interdisciplinary teaching methods:** Students rated the relevance and impact of interdisciplinary approaches on their understanding of the subject matter using a five-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree).
- **Understanding of economics and its interdisciplinary connections:** Questions focused on how the lectures enhanced students' comprehension of economic concepts in relation to culture, psychology, and global systems.



- **Contribution to holistic education:** Participants evaluated whether the lectures promoted a broader understanding of their field of study and their role in the global economy.
- **Future professional relevance:** Students assessed the utility of the knowledge gained for their prospective careers.
- **Preference for further interdisciplinary content:** Open-ended questions allowed students to suggest additional topics and provide qualitative feedback on the value of the lectures.

In addition to the primary survey data, the study incorporates findings from relevant academic literature. This included theoretical and empirical research on holistic education, interdisciplinary learning, and their application in higher education. The literature review provided a contextual framework for interpreting the survey results and linking them to broader educational theories and practices. Therefore, by combining survey data with insights from literature, this methodology provides a comprehensive basis for understanding the impact and importance of holistic and interdisciplinary approaches in education.

Quantitative data were analysed using descriptive statistics (mean, frequency distribution), while qualitative responses were coded thematically to identify emerging patterns. The integration of both methods provided a comprehensive view of student perspectives.

Although the study includes a limited sample (11 participants), this represents the entire population of students who attended the specific lectures analyzed in this research. As such, the study does not rely on a sample in the traditional sense but rather captures the full range of perspectives within this group. The findings provide an in-depth understanding of their experiences with interdisciplinary education. While the insights are specific to this context, future research could expand to include a broader range of students across different courses and institutions to enhance generalizability.

## 4. RESULTS AND DISCUSSIONS

The modern world faces challenges that require interdisciplinary solutions, critical thinking, and a profound understanding of various aspects of

social, economic, and cultural transformations. Traditional educational models, focused on narrow specializations and fragmented knowledge transmission, increasingly reveal their limitations in preparing individuals for the complex demands of contemporary life. In this context, the need for a holistic approach to education arises – a concept that integrates diverse disciplines, values intercultural and ethical perspectives, and emphasizes the comprehensive development of individuals, including their cognitive, emotional, and social dimensions. This approach not only enhances critical thinking and creativity but also shapes socially responsible and empathetic individuals, equipped to address global challenges. This part of the research will analyze the bureaucracy and its impact on holistic approach, as well as study results that concerns the need for holistic approach in education, conducted with students.

### 4.1. Bureaucracy and the search for truth

In today's "knowledge society", knowledge, information, and intellectual capital are considered the primary drivers of economic, social, and cultural development. In other words, the value of education has shifted from fostering critical thinking and personal development to accumulating information for economic utility. Therefore, in a society where knowledge is commodified and primarily valued for its economic applicability, education becomes increasingly transactional, reducing its scope to simply preparing individuals for the workforce (Liessman, 1988). This approach neglects the personal, ethical, and social dimensions of education, which are central to a holistic approach that integrates knowledge across disciplines.

Although the term "knowledge society," used to describe the present era, is often perceived as a source of pride and joy, it turns out that the knowledge of this society has little to do with practical wisdom or life-guiding understanding. As Liessmann notes, "Despite everything that people today can and must know—and that is no small amount—this knowledge lacks the power of synthesis. It remains a fragment—easily acquired, quickly adapted, easily forgotten" (Liessmann, 1988). Yet, knowledge is more than information—in a general sense, knowledge is a way of comprehending the world: to perceive, understand, and grasp it. Knowledge is not unidirectionally purpose-driven. For this reason, it is important to experience knowledge, internalize it, interconnect it, and synthesize it.

As Liessmann emphasizes, "Knowledge is not found in any database or unstructured heap of data. A random collection of facts stored in memory is still not knowledge. It only becomes knowledge when it can be interconnected according to logical and consistent criteria, resulting in meaningful and verifiable relationships" (Liessmann, 1988). In other words, knowledge always means being able to answer what something is and why it is what it is. Consequently, "for this reason, knowledge cannot be managed in a bureaucratic way" (Liessmann, 1988).

It has never been easier to gain somewhat comprehensive information on a topic, field of expertise, or phenomenon, particularly thanks to the internet and artificial intelligence. Paradoxically, this ease of access may undermine the formation of true knowledge. If this knowledge is not processed through experience and does not evolve into understanding, the information simply remains external. In other words, people are increasingly informed but decreasingly understand. As Liessmann observes, "Truth as the goal of science is now only discussed on Sundays," and he concludes with the question: "If the knowledge society does not care about wisdom, about insight, or understanding as central indicators of what holds that society together, then what does it care about—beyond the simulation of lifelong learning?" (Liessmann, 2009).

There are numerous factors that have contributed to this problem, but at its core lie increasing specialization and the absence of a holistic approach to education. In this sense, bureaucracy is identified by many prominent authors as one of the main obstacles to a holistic approach in education. In general, every new information technology brings both expected and unexpected consequences. Accordingly, bureaucracy, which Harari views as a form of information technology, has solved some old problems but has also created new ones.

The initial goal of bureaucracy is to introduce order into an increasingly complex and chaotic world of information. To this end, bureaucracy divides the world into different categories to simplify functioning, sorting, and data retrieval, although these categories do not necessarily reflect the real world. Furthermore, as Harari states, "Bureaucrats try to force the world into these drawers, and if the fit isn't very good, the bureaucrats push harder" (Harari, 2024). In other words, the world adapts to the forms and categories created by bureaucracy, rather than those categories adapting to the real world.

The effort to divide reality into strict categories often leads bureaucrats to focus on narrowly defined goals, disregarding the broader consequences of their actions. For instance, someone tasked with increasing industrial production might ignore environmental protection, which falls outside their mandate, and release toxic waste into a nearby river, causing an ecological disaster. If the government subsequently establishes an agency to combat pollution, its officials might advocate for even stricter regulations, even if these lead to a decline in economic activity. Ideally, someone would consider the problem in its entirety, considering all perspectives and aspects. However, such a holistic approach would require overcoming or abandoning bureaucratic divisions (Harari, 2024).

The distortions created by bureaucracy affect not only government agencies and private companies but also scientific disciplines. One fundamental example is the division of universities into different faculties and departments. History is separated from biology and mathematics, even though this division does not reflect objective reality. For instance, the COVID-19 pandemic was simultaneously a historical, biological, mathematical, economic, and psychological event. However, academic study of the pandemic has been fragmented across disciplines: history, biology, mathematics, economics, psychology, and many others. Students must choose a field to specialize in, and that decision limits their choice of disciplines, shaping their understanding of the world. For example, mathematics students learn to predict future morbidity rates; biology students study how the virus mutates over time; history students examine how religious and political beliefs influence people's willingness to follow government instructions; economics students analyze the pandemic's impact on the economy, and psychology students explore its effects on mental health. Yet, a comprehensive understanding of the COVID-19 pandemic requires considering its mathematical, biological, historical, economic, and psychological dimensions simultaneously. Academic bureaucracy, however, discourages such a holistic approach (Harari, 2024).

Moreover, the pressure to climb the academic ladder further exacerbates the drive toward specialization. Academia operates under the "publish or perish" rule—those who wish to work at a university must publish papers in academic journals. However, these journals are organized by discipline, meaning that publishing a paper on viral mutations in a biology journal requires following different conventions than publishing a paper on politics during the pandemic in a history journal. Different expectations also apply—historians are expected to deeply understand culture and

interpret historical documents, while biologists are expected to deeply understand evolution and interpret DNA molecules. Everything that falls between these two categories—such as the interaction between political ideologies and the evolution of viruses—is often neglected (Harari, 2024).

Thus, bureaucracy complicates or outright prevents holistic approaches, strengthens the centralized authority of the state, and stifles innovation. Universities, constrained by bureaucratic procedures and reaccreditation processes, are often unable to innovate to the extent necessary to respond to global changes and the needs of new generations of students.

Friedrich Hayek has also provided critical insights into the challenges posed by bureaucratic structures, many of which are relevant to implementing holistic approaches in education. Hayek critiques centralized systems, arguing that they are ill-suited to handle the complexity and dynamism inherent in human knowledge and interaction (Hayek, 1988). This critique is particularly pertinent to education, where rigid bureaucratic processes often hinder innovation, adaptability, and interdisciplinary learning—key elements of holistic education.

Central to Hayek's philosophy is the knowledge problem, which asserts that no single authority can fully possess or effectively utilize the vast and dispersed knowledge within a society. In an educational context, this highlights the limitations of standardized, top-down models that fail to address the diverse and evolving needs of students. Instead, Hayek's concept of spontaneous order advocates for decentralized, flexible systems in which knowledge is co-created through collaboration, experience, and cross-disciplinary engagement.

Hayek also critiques over-specialization, noting its tendency to narrow perspectives and limit adaptability. He contrasts this with the advantages of interdisciplinary approaches that align with the principles of holistic education (Hayek, 1988). His emphasis on cultural evolution further supports this perspective, suggesting that successful systems—whether societal or educational—emerge through iterative adaptation and the integration of diverse inputs and experiences. Finally, Hayek's advocacy for freedom as a prerequisite for creativity and innovation is particularly relevant to educational reform. Bureaucratic rigidity, as Hayek notes, suppresses these qualities, while holistic education thrives in environments that prioritize intellectual freedom, exploration, and the integration of multiple disciplines. Thus, Hayek's critique highlights the bureaucratic constraints that undermine holistic education while

reinforcing the importance of interdisciplinarity, adaptability, and cultural integration in preparing students for the complexities of the modern world.

Nevertheless, as Harari points out, in defense of bureaucracy, it must be acknowledged that although bureaucracy does not reflect objective reality and thereby sacrifices truth and distorts understanding, it does so to maintain order, without which it would be impossible to sustain any large information network (Harari, 2024). In this vein, Harari poses the question:

"Although bureaucracy is far from perfect, is there a better way to manage large networks? For example, if we decided to abandon all conventional divisions in the academic world—departments, faculties, and specialized academic journals—would every aspiring doctor be expected to spend several years studying history? Would people studying the influence of the Black Death on Christian theology be considered expert virologists? Would this lead to a better healthcare system?" (Harari, 2024).

As Harari argues, anyone dreaming of abandoning bureaucracy in favor of a holistic approach to the world should remember that hospitals are also bureaucratic institutions. While they suffer from numerous bureaucratic illnesses, they nonetheless succeed in curing a significant number of people of biological illnesses. The same applies to nearly all other services that improve life, including schools and universities (Harari, 2024).

In general, holistic education seeks to develop students beyond academic knowledge by integrating cognitive, emotional, social, and physical dimensions of learning. This approach is particularly evident in Scandinavian education systems, where Norway, Denmark, and Finland emphasize a balance between structured learning and experiential education. For example, in Norwegian kindergartens, a holistic model integrates care, play, and learning, fostering well-being through relationships and nature-based experiences (Aslanian et al., 2020). Similarly, Finland's educational system prioritizes unstructured play as a crucial element of transformative learning (Lee et al., 2014).

Beyond early childhood education, holistic learning strategies in Scandinavia promote social and emotional development, ensuring that education nurtures intellectual, moral, and interpersonal capacities (Putri & Ilmi, 2023). In Denmark, for instance, early education is also used as a tool to reduce social inequality, focusing on equal opportunities and early interventions (Jensen, 2009). Additionally, Finnish education integrates

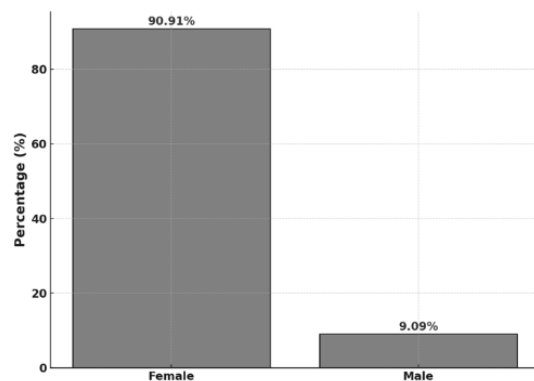
community engagement as a core principle, encouraging students to connect with their surroundings and actively participate in real-world learning experiences (Lee et al., 2014).

While holistic education is widely embraced in Scandinavian models, debates persist regarding the balance between academic rigor and holistic approaches. Some argue that an increased focus on structured learning might diminish the benefits of creativity and emotional intelligence, but Scandinavian practices continue to influence global discussions on progressive education (Mahmoudi et al., 2012).

## 4.2. The need for holistic approach in education – Study results

This chapter presents the results of the study, followed by a discussion of their implications. The findings are organized into thematic categories, beginning with demographic insights and concluding with participants' suggestions for enhancing education.

### 4.2.1. Gender distribution of participants



**Figure 1** Gender distribution of participants (percentage)

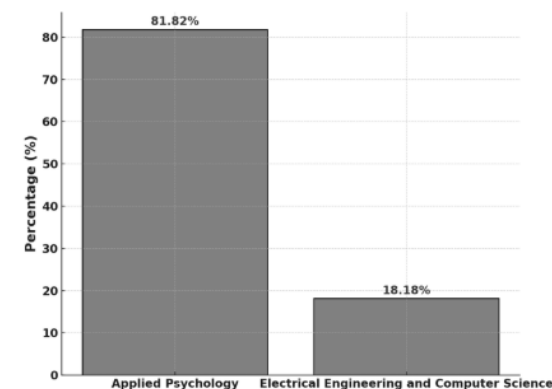
The study included 11 participants, of which 10 participants (90.91%) were female and 1 participant (9.09%) was male. The distribution is illustrated in Figure 1. This gender imbalance underscores the importance of ensuring diverse representation in future studies to capture a more comprehensive range of perspectives.

### 4.2.2. Faculty and academic program distribution

All participants in the study were students from the Faculty of Applied Sciences, at the University of Donja Gorica, representing two distinct academic programs (as shown in Figure 2):

Applied Psychology: 9 participants (81.82%).

Electrical Engineering and Computer Science: 2 participants (18.18%).



**Figure 2** Faculty and academic program distribution

The dominance of students from the Applied Psychology program reflects the primary academic focus of the survey, which aligns with the multidisciplinary themes explored. The smaller representation of Electrical Engineering and Computer Science students provides additional, albeit limited, insight into how the multidisciplinary approach is perceived in a technical field. This distribution underscores the importance of involving a wider array of academic programs in future studies to ensure diverse perspectives on multidisciplinary education. Integrating insights from both social sciences and technical disciplines may yield more comprehensive conclusions about the applicability of this approach across fields.

### 4.2.3. Perception of the usefulness of multidisciplinary education

Participants were asked to evaluate the usefulness of a multidisciplinary approach in their education. The results were as follows:

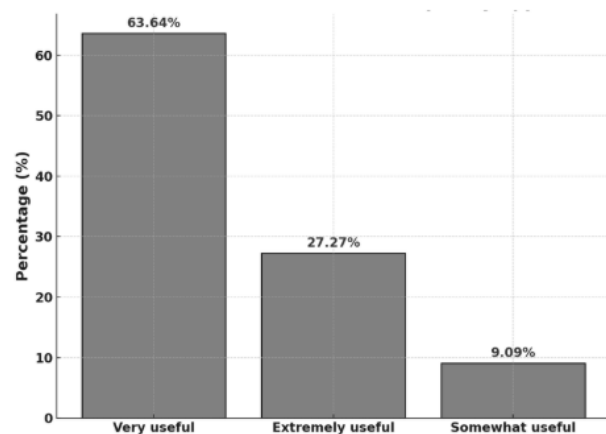


**Very useful:** 7 responses (63.64%)

**Extremely useful:** 3 responses (27.27%)

**Somewhat useful:** 1 response (9.09%)

The majority of participants (90.91%) rated the multidisciplinary approach as either "very useful" or "extremely useful." Only a small fraction (9.09%) considered it "somewhat useful," and no participants rated it as "not useful." This overwhelmingly positive response highlights the value students place on integrating multiple disciplines in their education. The high proportion of "very useful" responses suggests that students appreciate the practical and theoretical benefits of connecting diverse fields of study. The absence of negative responses reinforces the broad acceptance of this approach among the surveyed group. The distribution of responses is illustrated in Figure 3 below.



**Figure 3** Perception of the usefulness of a multidisciplinary approach (percentage).

The results underscore the effectiveness of incorporating interdisciplinary methods in academic programs, suggesting that students find it beneficial for understanding complex topics and gaining broader perspectives. The findings strongly advocate for the integration of multidisciplinary frameworks into higher education curricula to enhance students' adaptability and critical thinking. These findings resonate with the OECD's emphasis on fostering creativity and critical thinking through interdisciplinary approaches, which enable students to tackle complex challenges effectively (Saroyan, 2020). The importance of integrating

multidisciplinary approaches is also well-supported by frameworks promoting 21st-century skills, which emphasize creativity, critical thinking, communication, and collaboration as essential competencies for future success (Thornhill-Miller et al., 2023).

#### 4.2.4. Contribution of lectures on free trade and culture to understanding economics

Participants were asked how much lectures on free trade and culture contributed to their broader understanding of economics. The results were as follows:

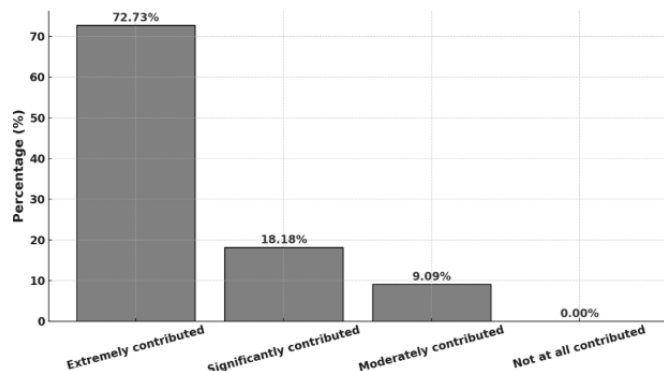
**Extremely contributed:** 8 responses (72.73%)

**Significantly contributed:** 2 responses (18.18%)

**Moderately contributed:** 1 response (9.09%)

**Not at all contributed:** 0 responses (0%)

The vast majority of participants (90.91%) indicated that the lectures contributed either "extremely" or "significantly" to their understanding of economics. Only a small portion (9.09%) rated the contribution as "moderate," and no participants reported that the lectures failed to contribute at all. These results highlight the effectiveness of the lectures in bridging the concepts of free trade, culture, and economics. The dominance of "extremely contributed" responses indicates a strong alignment between the lecture content and its perceived value among students. This suggests that integrating cultural perspectives into economic discussions resonates well with the students and enhances their comprehension of the subject. The response distribution is represented in Figure 4 below.



**Figure 4** Contribution of lectures on free trade and culture to understanding economics (percentage).

The findings emphasize the importance of incorporating interdisciplinary topics, such as culture and trade, in economics education. This approach not only deepens understanding but also broadens the context within which students analyze economic systems.

The integration of cultural and economic topics aligns with the OECD's framework, which advocates for curricula that promote creativity and critical thinking as essential 21st-century skills (Saroyan, 2020). The findings also align with global trends in education that prioritize the '4Cs'—creativity, critical thinking, communication, and collaboration—as foundational for addressing complex, interconnected global challenges (Thornhill-Miller et al., 2023).

#### 4.2.5. How lectures contributed to a broader understanding of economics

Students were asked to identify the most significant way the lectures on free trade and culture contributed to their understanding of economics. The responses were as follows:

- **I learned how free trade and culture influence the development of economic and social systems:** 4 responses **(36.36%)**
- **I understood how cultural and social factors shape global economic flows:** 2 responses **(18.18%)**

- **I developed critical thinking about the role of trade and culture in modern society:** 2 responses **(18.18%)**
- **The lectures enabled me to view economics through different disciplines, including psychology and culture, and vice versa:** 2 responses **(18.18%)**
- **Other (free-text explanation):** 1 response **(9.09%)**

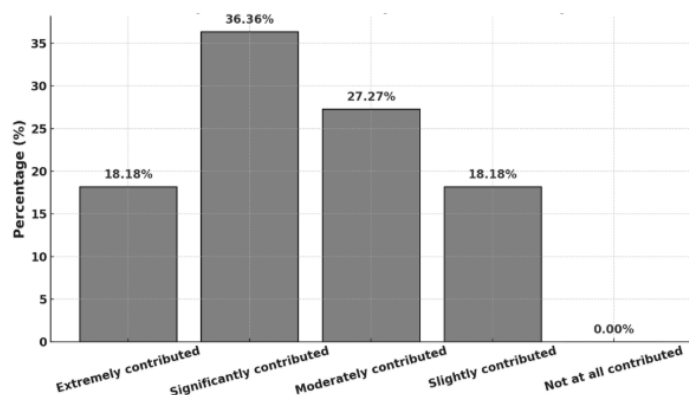
The most frequently selected option **(36.36%)** emphasizes the role of free trade and culture in shaping economic and social systems, demonstrating that students found value in connecting these concepts to practical societal contexts. The diversity in responses reflects the multidimensional impact of the lectures, addressing various aspects of economics, critical thinking, and interdisciplinary analysis. The combination of free trade, culture, and economics resonated with students by highlighting their interconnectedness. Responses like "I developed critical thinking about the role of trade and culture" and "I understood how cultural and social factors shape global economic flows" point to the lectures' success in fostering analytical skills and broadening perspectives. The inclusion of interdisciplinary insights, further enriched students' understanding of economics. One student stated: "I learned many useful topics related to humans and their role in society," underscoring the human-centric dimension of the lectures. These findings underline the effectiveness of integrating diverse topics into economics education, allowing students to grasp the subject from multiple perspectives, fostering critical thinking, and enriching their academic experience.

#### 4.2.6. Contribution of lectures to understanding the students' field of study

Students were asked how much the lectures on free trade and culture contributed to a broader understanding of their specific field of study (e.g., psychology, electrical engineering). The responses were distributed as follows:

- **Extremely contributed:** 2 responses **(18.18%)**
- **Significantly contributed:** 4 responses **(36.36%)**
- **Moderately contributed:** 3 responses **(27.27%)**

- **Slightly contributed:** 2 responses (18.18%)
- **Not at all contributed:** 0 responses (0%)



**Figure 5** Contribution of lectures to understanding the students' field of study (percentage)

The results indicate that a majority of students (81.82%) rated the lectures as contributing at least moderately to their understanding of their field of study, with a significant proportion (54.54%) finding them either "extremely" or "significantly" beneficial. Only 18.18% felt that the contribution was minimal, and none reported no contribution at all. The "significant" and "extreme" contributions reported by over half of the students reflect the interdisciplinary impact of the lectures. These responses highlight the value of connecting cultural and economic perspectives to diverse fields like psychology and engineering. The moderate responses suggest that the lectures may have varying levels of relevance depending on the specific academic discipline. The absence of "not at all contributed" responses reinforces the idea that even minimal integration of such topics can provide value across disciplines. The distribution of responses is illustrated in Figure 5.

The findings demonstrate the potential for lectures on free trade and culture to enhance understanding across a range of academic disciplines. By addressing economic and cultural influences, these lectures provide students with tools to analyze their fields from a broader and more integrated perspective.

#### 4.2.7. How lectures contributed to a broader understanding of students' fields of study

Participants were asked to identify the most significant way lectures on free trade and culture contributed to their broader understanding of their specific academic fields. The responses were distributed as follows:

- **They sparked new ideas and interests within my field:** 2 responses (18.18%)
- **The lectures helped me understand the broader context of my field and its connection to global societal and economic processes:** 2 responses (18.18%)
- **The lectures helped me see my field through different disciplines, including economics and culture:** 2 responses (18.18%)
- **They helped me understand my field more deeply and recognize the interdependence between different disciplines:** 3 responses (27.27%)
- **The lectures helped me recognize how global economic and cultural trends influence the development of various professions:** 1 response (9.09%)
- **Other (free-text responses):** 1 response (9.09%)

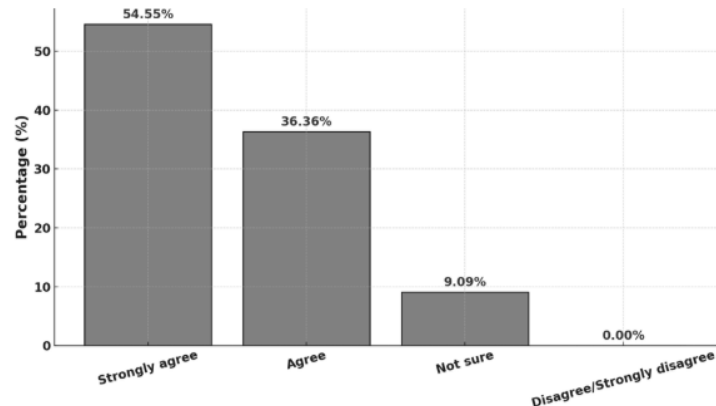
The responses indicate that students valued various aspects of the interdisciplinary lectures, with the largest proportion (27.27%) stating that the lectures deepened their understanding of their field and helped them identify interconnections between disciplines. Other significant responses include fostering new ideas and seeing their field from new disciplinary perspectives, highlighting the varied impact of these lectures. The high percentage of responses emphasizing deeper understanding and interconnection suggests that lectures successfully bridged disciplinary divides, providing students with a more integrated perspective on their fields. Responses such as "The lectures sparked new ideas and interests within my field" indicate that the interdisciplinary nature of the content stimulated curiosity and innovation. Free-text responses, such as "I heard many useful facts and theories and had the opportunity to express ideas through essay writing," underline the interactive and reflective benefits of the lectures.

The findings show that interdisciplinary lectures fostered both academic depth and creative thinking, enabling students to view their fields through broader lenses and encouraging critical examination of global economic and cultural influences. This underscores the value of such content in higher education curriculums.

#### 4.2.8. Do lectures on free trade and cultural influence contribute to a holistic approach to education?

Participants were asked to evaluate whether the lectures on free trade and cultural influence on economics contribute to their holistic approach to education. The responses were as follows (as shown in Figure 6):

- **Strongly agree:** 6 responses **(54.55%)**
- **Agree:** 4 responses **(36.36%)**
- **Not sure:** 1 response **(9.09%)**
- **Disagree/Strongly disagree:** 0 responses **(0%)**



**Figure 6** Contribution of lectures to a holistic approach to education (percentage).

The majority of participants **(90.91%)** expressed agreement or strong agreement, indicating that the lectures positively contributed to their holistic educational experience. Only one participant **(9.09%)** was uncertain, and none disagreed, reinforcing the overall perception that these lectures enhance a broad, interdisciplinary understanding. A large

proportion of "strongly agree" responses highlights the alignment of the lectures with holistic educational goals, integrating diverse knowledge streams. The absence of negative responses suggests that all students found at least some value in this approach. The single "not sure" response may reflect a need for further clarity or emphasis on the practical application of these ideas in holistic education.

These findings affirm that lectures addressing free trade and cultural influence are instrumental in fostering holistic learning. They help students connect economic theories with broader societal and cultural contexts, which is essential for understanding global challenges and cultivating interdisciplinary skills.

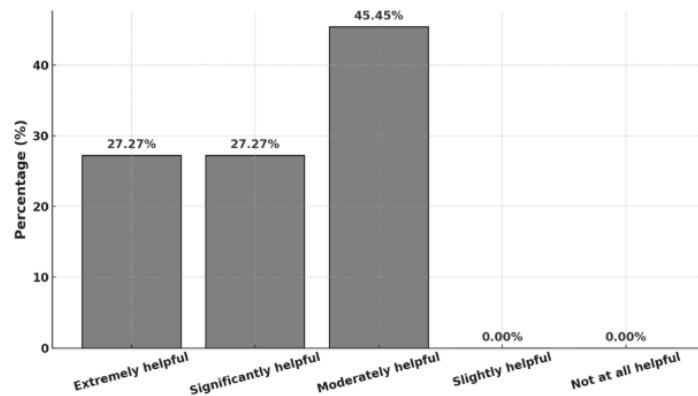
#### 4.2.9. Contribution of lectures to understanding the link between students' fields and socioeconomic systems

Participants were asked how much lectures on economics and culture helped them better understand the connection between their field of study and societal and economic systems. The responses were as follows:

- **Extremely helpful:** 3 responses **(27.27%)**
- **Significantly helpful:** 3 responses **(27.27%)**
- **Moderately helpful:** 5 responses **(45.45%)**
- **Slightly helpful:** 0 responses **(0%)**
- **Not at all helpful:** 0 responses **(0%)**

The distribution of responses is depicted in Figure 7.





**Figure 7** Contribution of lectures to understanding the students' field of study (percentage).

The majority of participants (**72.72%**) found the lectures at least significantly or moderately helpful, with **27.27%** reporting the lectures as "extremely helpful." None of the respondents indicated that the lectures were "slightly helpful" or "not at all helpful," demonstrating that all participants found value in the lectures to some extent. The largest group of responses (45.45%) rated the contribution as "moderately helpful," suggesting room for further refinement of lecture content to increase its perceived utility. The relatively high percentage of "extremely" and "significantly helpful" responses underscores the relevance of integrating economic and cultural topics to foster interdisciplinary understanding. The absence of negative responses indicates that the lectures successfully bridged the gap between academic disciplines and broader societal and economic systems.

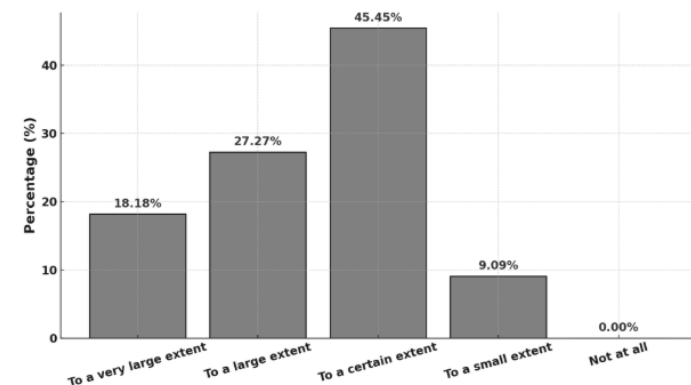
The findings suggest that lectures on economics and culture effectively enhance students' understanding of how their academic fields interact with larger societal and economic structures. This interdisciplinary approach supports a more comprehensive education, enabling students to contextualize their knowledge within real-world systems.

#### 4.2.10. Relevance of knowledge about economics and culture for future careers

Participants were asked to assess how much knowledge about economics and culture will benefit their future professional careers. The responses were distributed as follows:

- **To a very large extent:** 2 responses (**18.18%**)
- **To a large extent:** 3 responses (**27.27%**)
- **To a certain extent:** 5 responses (**45.45%**)
- **To a small extent:** 1 response (**9.09%**)
- **Not at all:** 0 responses (**0%**)

The majority of participants (**90.91%**) found the knowledge about economics and culture at least somewhat useful for their future careers, with **45.45%** rating it as beneficial "to a certain extent." Only **9.09%** of respondents felt it would be useful "to a small extent," and no one stated it would not be useful at all. The high proportion of "certain extent" responses suggests that while most students recognize the value of this knowledge, it may not be perceived as immediately critical for all professional paths. A notable portion of respondents (**45.45%** combined) indicated that the knowledge would be useful "to a very large" or "large extent," highlighting its potential relevance in interdisciplinary or culturally-sensitive professions. The lack of "not at all" responses affirms that integrating economics and culture into the curriculum has broad applicability across career fields. The response distribution is illustrated in Figure 8.



**Figure 8** Perceived relevance of knowledge about economics and culture for future careers (percentage).

The findings highlight the importance of incorporating cultural and economic perspectives into education. This knowledge equips students

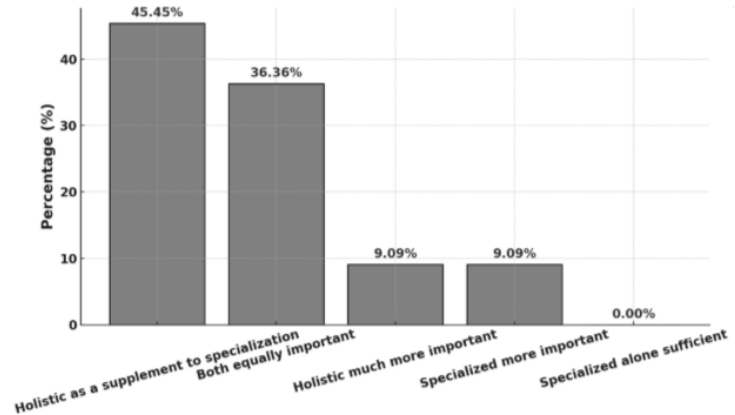
with critical skills for navigating diverse professional environments, where understanding socioeconomic systems and cultural dynamics is increasingly essential.

#### 4.2.11. Importance of holistic education compared to specialized education

Participants were asked to assess the importance of a holistic approach to education compared to specialized education within their field. The responses were distributed as follows:

- **Holistic education is important, but only as a supplement to specialization:** 5 responses (45.45%)
- **Both approaches are equally important:** 4 responses (36.36%)
- **Holistic education is much more important:** 1 response (9.09%)
- **Specialized education is more important:** 1 response (9.09%)
- **Specialized education alone is sufficient for professional success:** 0 responses (0%)

The majority of participants (81.81%) indicated that holistic education plays a significant role, either as a supplement or on equal footing with specialized education. Only a small percentage placed greater emphasis on one approach, with 9.09% prioritizing specialization and an equal percentage valuing holistic education more highly. The high percentage of responses favoring a balance between the two approaches reflects the recognition of their complementary roles in fostering both depth and breadth of knowledge. The lack of responses indicating that specialized education alone is sufficient highlights the growing importance of interdisciplinary and holistic learning in modern academic and professional contexts. The single response prioritizing holistic education ("much more important") suggests that some students view it as crucial for addressing complex societal and global challenges. The response distribution is represented in Figure 9.

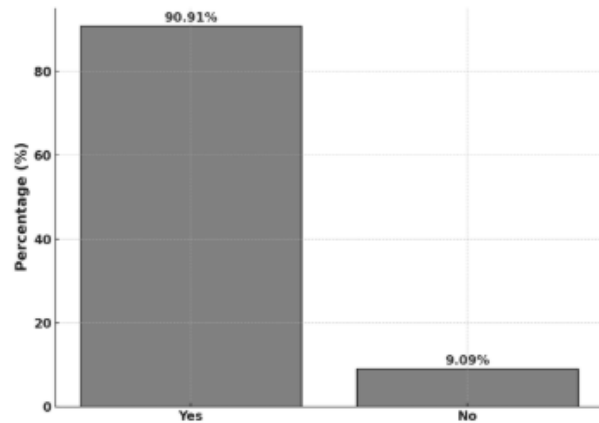


**Figure 9** Perceived importance of holistic education compared to specialized education (percentage).

These findings underscore the need for educational programs to strike a balance between holistic and specialized approaches. While specialization provides depth in a particular field, holistic education equips students with the ability to integrate knowledge across disciplines, fostering critical thinking and adaptability in diverse professional environments.

#### 4.2.12. Interest in additional lectures connecting fields of study with economics, culture, or other disciplines

Participants were asked if they would like to have more lectures connecting their field of study with economics, culture, or other disciplines. The responses were as follows, with the distribution shown in Figure 10:



**Figure 10** Interest in additional lectures connecting fields of study with economics, culture, or other disciplines (percentage.)

- **Yes:** 10 responses **(90.91%)**.
- **No:** 1 response **(9.09%)**

The overwhelming majority of students expressed a desire for more interdisciplinary lectures. The reasoning behind this interest, as explained in their comments, reveals various motivations and insights:

### 1. Broadening knowledge

Many participants emphasized the usefulness of these lectures in expanding general and specialized knowledge. For example:

"I find economics lectures very useful as they expand my general knowledge."

"These lectures opened new perspectives in my field that I hadn't considered before."

### 2. Practical application and professional development

Students highlighted the importance of interdisciplinary knowledge for practical problem-solving and professional success:

"Having knowledge from various fields helps me approach problems

more effectively."

"I think it's important for everyone to have knowledge of other disciplines to achieve a holistic approach."

### 3. Interdisciplinary relevance

Some participants expressed a strong belief in the value of integrating different fields:

"Interdisciplinarity is important in itself, especially understanding the connections and influences among fields."

"I believe it's essential to explore more connections between psychology and economics, as these intersections are currently underexplored."

### 4. Pedagogical suggestions

Several comments included suggestions for further development, such as incorporating workshops or focusing on specific skills:

"More workshops would be great."

"It would also be good to include grammar, culture in speech, expression, and art in such interactive formats."

### 5. Contrasting perspective

The single participant who did not want more lectures expressed concerns about focus and specialization:

"I want to concentrate on my profession, and too many directions within one field confuse me and make me lose focus."

The findings underscore a strong demand for interdisciplinary approaches in education, as students recognize their value in broadening perspectives, enhancing problem-solving skills, and preparing for complex professional challenges. The singular dissenting view highlights the importance of balancing depth in specialization with the breadth provided by interdisciplinary learning.

#### 4.2.13. Most appreciated aspects of lectures on economics, culture, and other topics

Participants were asked to describe the aspects of lectures they found most engaging or useful. Their responses reveal diverse preferences and highlight the features of the lectures that resonated most with them:

##### Key themes identified in responses

##### 1. Interactivity and engagement

Many participants praised the interactive nature of the lectures, particularly those involving discussions, group work, and role-playing:

"The class where we discussed trade (tribes) was my favorite because it was very active and not monotonous. It also helped me get to know my colleagues better."

"Interactive discussions where we developed critical thinking and teamwork skills stood out. I especially appreciated the encouragement to speak freely and use creativity."

##### 2. Creativity and unique teaching methods

Students appreciated activities that allowed them to think creatively and explore unconventional approaches:

"I enjoyed sitting in a circle, essay writing, and activities like imagining ourselves in a prehistoric period, with sounds, decorated papers, and small props like treasure chests."

"The workshop on survival was an excellent way to learn about the value of economics while also discovering group dynamics and personal abilities."

##### 3. Broader perspective and critical thinking

Several responses emphasized how the lectures expanded their understanding of economics and societal systems:

"The lecture on free trade ('I, Pencil') opened my eyes to how even the simplest products require complex networks. It made me reflect on how

life would be without trade."

"The discussion on cultural heritage in global brands and the use of resources for survival taught me about broader economic values and practical applications."

##### 4. Cultural insights

The psychological and cultural dimensions of the topics were particularly appreciated:

"The lecture on culture fascinated me because it explored how a nation's history, traditions, and collective unconscious influence individuals and their economies."

##### 5. Group work and collaboration

Working in teams was highlighted as a positive aspect:

"Group activities made the material more interesting and led to better outcomes when followed by discussions and presentations."

##### 6. Practical life lessons

Some participants found the lectures to be applicable beyond academics:

"The importance of free trade was the most useful topic for me. It taught me that we cannot do everything on our own and highlighted the significance of networks."

##### Representative quotes

"The activities helped me understand myself better while learning through creative and fun methods."

"I loved the freedom to express our opinions and use our imagination in some of the exercises."

"These lectures gave me a deeper understanding of my field and its connection to other disciplines."



The responses reveal that students greatly value innovative teaching methods that combine theory with practical applications. Interdisciplinary elements, creative exercises, and collaborative activities were particularly impactful, as they provided opportunities for personal growth, critical thinking, and a broader understanding of their fields.

These findings underscore the importance of active, interdisciplinary, and creative approaches in education. By integrating cultural, economic, and practical dimensions, the lectures successfully engaged students and provided them with both academic knowledge and life skills. This feedback suggests that expanding such teaching methods could further enhance the learning experience.

#### 4.2.14. Additional areas that could contribute to students' education

Participants were asked to suggest three additional areas they believe could enhance their education. Their responses highlighted a diverse range of disciplines and skills, reflecting both academic and practical interests. Below is a thematic summary of the suggestions with the distribution detailed in Figure 11:

##### Key areas identified

**1. Humanities:** Literature, philosophy, history.

Examples: "Literature, philosophy, and history." / "Debates, literature, and art."

**2. Communication and Sociology:** Communication studies, sociology.

Examples: "Public speaking, sociology, and hobbies." / "Communication, sociology, and philosophy."

**3. Practical Skills:** Law, volunteering, politics.

Examples: "Law, politics, and security." / "Volunteering, psychology, and medicine."

**4. Arts and Technology:** Creativity, programming.

Examples: "Literature, programming, and communication." / "Creativity, philosophy, and art."

**5. Holistic Learning:** Interdisciplinary combinations.

Examples: "Philology, philosophy, and sociology." / "Communication, sociology, and history."

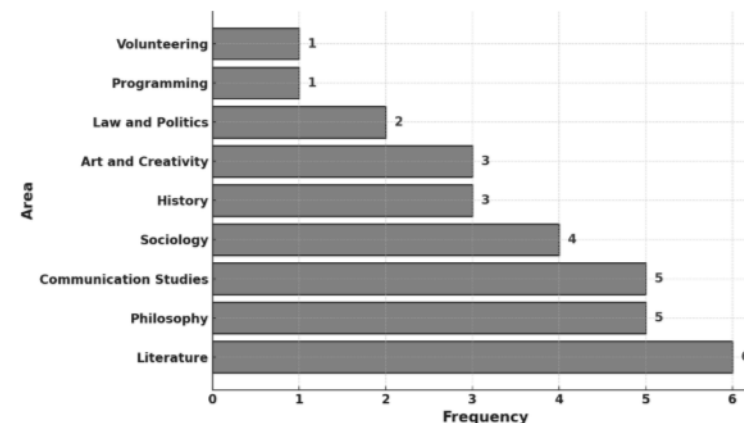


Figure 12 Frequency of interest in different areas

The suggestions emphasize the importance of interdisciplinary education, with a strong interest in integrating humanities, communication, practical skills, and creative disciplines. These areas reflect students' desire for a holistic learning experience that balances theoretical knowledge with practical application and personal growth. Integrating such fields into curricula could significantly enhance students' academic and professional development.

## 5. RESEARCH LIMITATIONS

This study, while offering valuable insights into the role of holistic and interdisciplinary approaches in education, has certain limitations. Potential limitations of the methodology include the reliance on self-reported data, which may be subject to social desirability bias, where students may provide answers they perceive as favorable rather than reflective of their true opinions. Additionally, the study focuses on a single course, which means that the findings may not be generalizable to other academic settings or disciplines. Moreover, the study captures students' perceptions immediately following the course, leaving the long-term impact of the teaching method unexplored. The gender imbalance, which was present in this research due to sample's gender distribution,

underscores the importance of ensuring diverse representation in future studies to capture a more comprehensive range of perspectives. Additionally, faculty and academic program distribution recorded in this research underscores the importance of involving a wider array of academic programs in future studies to ensure diverse perspectives on multidisciplinary education. Integrating insights from both social sciences and technical disciplines may yield more comprehensive conclusions about the applicability of this approach across fields.

A more extensive future research, incorporating longitudinal data and comparative analysis with traditional teaching models, could address these limitations and provide a deeper understanding of the sustained benefits and challenges of holistic education. Despite these limitations, the study provides a meaningful contribution to the growing body of research on innovative pedagogical approaches in higher education.

## 6. CONCLUSION

Holistic education provides students with a broader, interconnected understanding of knowledge, preparing them to navigate complex global challenges. The findings of this study emphasize the need for a more flexible and interdisciplinary approach in higher education, where cognitive, emotional, social, and experiential learning are valued equally. However, institutional structures often reinforce rigid disciplinary boundaries, limiting students' exposure to holistic learning experiences. While universities recognize the value of interdisciplinary education, implementation remains hindered by bureaucratic and administrative constraints.

To ensure holistic education becomes an integral part of university learning, institutions must adopt structural changes that promote interdisciplinarity, innovation, and student-centered learning. One key strategy is to redesign curricula to encourage interdisciplinary courses and project-based learning that integrate perspectives from economics, psychology, social sciences, and cultural studies. This shift would enable students to apply theoretical knowledge in real-world contexts while developing critical thinking and problem-solving skills.

Additionally, universities should implement flexible administrative structures that allow for modular programs and cross-disciplinary enrollment, making it easier for students to customize their learning

pathways. Encouraging faculty collaboration, co-teaching models, and providing academic incentives for interdisciplinary research and teaching initiatives will further strengthen the integration of holistic education.

Beyond curriculum reform, student-centered initiatives such as mentorship programs, interdisciplinary workshops, and collaborative learning environments can foster deeper engagement and experiential learning. These strategies would ensure that holistic education is not just a theoretical concept but an applied practice that prepares students for a rapidly evolving world.

By implementing these reforms, universities can break down disciplinary silos and create an academic environment that nurtures intellectual curiosity, adaptability, and lifelong learning. The transformation toward holistic education is not just a pedagogical shift—it is a necessary evolution that aligns education with the complex realities of the 21st century.

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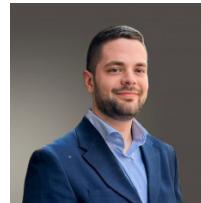
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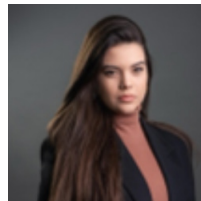
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# 6.

## Nobel Laureates: How the World's Greatest Economic Minds Shaped Modern Thought – a book review

Maja Juncaj





# Nobel Laureates: How the World's Greatest Economic Minds Shaped Modern Thought – a book review

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## ABSTRACT:

This paper, which contains a short review of the book "Nobel Laureates: How the World's Greatest Economic Minds Shaped Modern Thought" written by Marilu Hurt McCarty, aims to explore the contributions of Nobel Prize winners in economics in shaping modern economic thought, highlighting their fundamental contributions, methodological innovations, and the impact of their work in the real world.

The structure of this review follows the organization of the book, grouping the contributions of Nobel Prize laureates into thematic areas as presented by McCarty. These thematic divisions reflect the evolution of economic thought across various domains, including rationality and individual choice, macroeconomic modeling, economic development, financial markets, and institutional frameworks.

McCarty's approach makes complex economic theories accessible to both academics and policymakers by linking theoretical concepts to real-world applications. The book's practical orientation and thematic organization highlight the relevance of economic thought in addressing societal progress and pressing global issues, offering valuable insights into the transformative power of economics.

**Keywords: Nobel Prize, economic sciences laureates, modern economic thought, economics**

## 1. INTRODUCTION

The contributions of Nobel Prize laureates in Economic Sciences have profoundly shaped modern economic thought and practice. Marilu Hurt McCarty's book, „Nobel Laureates: How the World's Greatest Economic Minds Shaped Modern Thought“ offers a comprehensive examination of these contributions, highlighting their theoretical innovations and real-world applications. This review aims to explore the key insights presented in McCarty's work, emphasizing the practical relevance of the laureates theories in addressing societal challenges and advancing the field of economics.

The structure of this review follows the organization of the book, grouping the contributions of Nobel Prize laureates into thematic areas as presented by McCarty. These thematic divisions reflect the evolution of economic thought across various domains, including rationality and individual choice, macroeconomic modeling, economic development, financial markets, and institutional frameworks. By adhering to this structure, the review will provide a comprehensive summary of the contributions of Nobel laureates in Economic Sciences as outlined in the book, highlighting their groundbreaking ideas and their impact on shaping modern economic thought and addressing real-world challenges.

## 2. NOBEL PRIZE IN ECONOMIC SCIENCES

The Nobel Prize in Economic Sciences was founded in 1968. and it holds profound historical and conceptual significance. Unlike the original Nobel Prizes, it was introduced to recognize groundbreaking contributions to the evolving field of economics, emphasizing its critical role in understanding and addressing societal challenges. This award serves as a bridge between abstract theory and practical application, highlighting the importance of economic research in shaping policies and influencing global progress.

The Nobel Prize in Economics recognizes innovative theories and methodologies that shape contemporary economic thought and practice. The first prize in economic sciences was awarded to Ragnar Frisch and Jan Tinbergen in 1969.<sup>1</sup>

By honoring those who develop innovative methods, tackle pressing

issues, and propose solutions for sustainable growth, the prize underscores the enduring relevance of economics as a tool for improving human welfare. Its history reflects the shifting priorities of each era, from addressing economic crises to promoting development and equity, marking a continuous dialogue between academic innovation and real-world impact.

Although the Nobel Prize in Economics was not part of Alfred Nobel's original vision, it has emerged as a foundation in recognizing research that redefines our understanding of economic challenges, from market efficiency to global development issues. This prestigious award underscores the dynamic interplay between economic theories and practical policy applications, ensuring that groundbreaking ideas not only thrive in academic discourse but also address pressing societal concerns.

Through the decades, Nobel laureates have provided transformative insights into economic systems, guiding policymakers and shaping debates on issues such as fiscal strategies, resource allocation, and social equity. The award's ability to highlight these contributions ensures a lasting impact, bridging theoretical advancements with real-world applications.<sup>2</sup>

The contributions of the researchers mentioned in this review encompass microeconomics, macroeconomics, game theory, econometrics, international trade, public policy, financial markets, and economic inequalities, significantly advancing the development of contemporary economic theory and practice.

## 2.1. Marilu Hurt McCarty and the Approach of the Book

Marilu Hurt McCarty's „Nobel Laureates: How the World's Greatest Economic Minds Shaped Modern Thought“ takes on the task of making the intellectual achievements of economics Nobel laureates accessible to a broader audience. The book stands out for its ability to distill complex economic theories into narratives that connect directly with everyday life. By focusing on how these ideas apply to solving practical problems, McCarty demonstrates the enduring relevance of economic thought. Her approach invites readers to appreciate the depth and diversity of contributions from these eminent academics while showcasing the

human dimension behind their groundbreaking work.

McCarty's approach is particularly notable for its accessibility, as it distills complex economic theories into relatable narratives, making the work valuable not only to academics but also to experts and policymakers.

## 2.2. Contemporary Relevance of Economic Theories

In a rapidly evolving global landscape, the relevance of Nobel-winning economic theories extends far beyond academic circles. These theories serve as essential tools for understanding and addressing current challenges such as inflation, climate change, and rising inequalities. For instance, the application of game theory to international negotiations, insights from behavioral economics to design effective public policies, or innovative frameworks for sustainable economic development exemplify how these laureates work transcends theoretical boundaries.

McCarty's book was chosen for this review exactly because it effectively captures the transformative influence of these economic ideas in real-world scenarios. It provides a clear and insightful exploration of how Nobel-winning theories continue to shape policymaking and economic strategies, offering readers a deeper understanding of their practical implications. By illustrating how these concepts evolve to meet contemporary challenges, the book highlights the enduring relevance of economic thought in improving societies and guiding future decisions.

Economic theories are not static but evolve to meet the demands of new contexts, providing policymakers and experts with frameworks to navigate uncertainty and complexity. As McCarty's book reveals, the Nobel Prize in Economics is more than an honor; it is a testament to the power of ideas to shape and improve the world in profound ways.

## 3. ECONOMIC SCIENCES LAUREATES

### 3.1. Rationality and individual choice

The first group of Nobel laureates in Economic Sciences made significant contributions to the understanding of rationality and individual choice, shaping economic theory and policy-making. Their work emphasizes that

individuals make decisions based on preferences and goals, considering limited resources and available information, with the aim of maximizing utility or satisfaction.

These laureates, often referred to as neoclassical economists, linked their philosophy to the classical economists of the 18th and 19th centuries. Through their works, they have revolutionized the understanding of rationality and decision-making, shaping modern economic theory and practice.

**George Stigler (1982)<sup>3</sup>** was a leading neoclassical economist and the foremost rationalist among all economists. Stigler defined, articulated, and clarified concepts that make economics a fundamental discipline within the social sciences. His work on the theory of optimization and market equilibrium demonstrated how markets, through competition, tend toward the efficient allocation of resources. Stigler advocated minimal government intervention and free markets as the key to maximizing societal welfare.

**Friedrich von Hayek (1974)**, renowned for his book *The Road to Serfdom* (1944), shared the Nobel Prize with Gunnar Myrdal. Hayek was a steadfast proponent of free-market capitalism and the theory of spontaneous order, emphasizing that decentralized decision-making leads to more efficient outcomes than central planning, which often results in tyranny and the loss of individual freedoms. Beyond critiquing central planning, he offered a positive vision of how free societies can operate efficiently and equitably.

**Gary Becker (1992)** extended economic theory beyond traditional market contexts to include areas such as crime, education, and family decisions. His analysis of rational choice demonstrated how individuals make decisions by weighing costs and benefits, even in social situations. His work on the theory of human capital and the economic analysis of crime is particularly notable.

**Herbert Simon (1978)** introduced the concept of "bounded rationality," highlighting that human decision-making is constrained by cognitive abilities and available information. Instead of optimizing, people often make decisions that are "good enough." Simon critiqued classical assumptions of rational behavior, arguing that perfect rationality is unattainable in the real world.

While Stigler, Hayek, and Becker share a foundation in rationality and market-oriented frameworks, their areas of focus and applications differ. Hayek emphasizes decentralized order and political freedom, Stigler centers on market efficiency, and Becker broadens the scope of economic inquiry into social domains. Simon diverges from all three by fundamentally rethinking the assumptions of rationality, thereby reshaping the analytical tools used to understand economic and organizational behavior. Together, their works offer complementary and contrasting perspectives that enrich the field of economics when it comes to rationality and individual choice.

### 3.2. Limits to rationality and the role of government

Limited rationality and the role of government in economics are key concepts explored by numerous Nobel Prize laureates in Economic Sciences. These economists have analyzed how people make decisions under uncertainty and with limited information and resources, as well as the role of government in the economy, examining how public policies can address market failures and support sustainable growth. They have significantly contributed to the understanding of the complex relationships between rationality, markets and government interventions, enriching economic and social theories.

**Kenneth Arrow (1972)**, who received the prize alongside **John Hicks**, developed the Impossibility Theorem, which highlights the limitations of rationality in collective decision-making. His work revealed the voting paradox, emphasizing the challenges of achieving rational decisions through political processes; whenever voters are presented with more than two alternatives, it is impossible to achieve consistent electoral outcomes.

**James Buchanan (1986)** was awarded the prize for developing public choice theory, which examines political processes through an economic lens. Buchanan argued that political actors often act in accordance with their own interests rather than the public good, posing challenges to the formulation of public policies.

**Ronald Coase (1991)** received the prize for his research on transaction costs and externalities. His work demonstrated that clearly defined property rights and low transaction costs enable the efficient resolution



of externalities without the need for government intervention, revolutionizing the theory of the firm and corporate governance.

**Amartya Sen (1998)** was awarded the prize for combining economics and philosophy in the study of social choice, thereby reintroducing an ethical dimension to the discussion of vital economic problems. Sen expanded Arrow's social choice theory by incorporating ethical considerations such as justice and equality into the analysis of collective decision-making and economic policies.

Arrow, Buchanan, Coase, and Sen all examine the limitations of rationality and the role of government, but their perspectives and conclusions differ significantly. Arrow's work highlights the mathematical challenges of achieving collective rationality, whereas Buchanan's public choice theory critiques the self-interest inherent in political processes. Coase focuses on minimizing government intervention by promoting efficient property rights and low transaction costs, while Sen emphasizes the ethical and philosophical dimensions of economic policies, advocating for justice and equality.

Together, these perspectives provide a well-rounded view and understanding of how rationality and governance intersect in economics. These diverse viewpoints collectively offer a deeper understanding of the complexities in markets and society, balancing efficiency with ethical considerations.

### 3.3. Measuring to understand

The development of econometrics and quantitative methods has enabled a deeper understanding of economic phenomena and the formulation of effective policies. The third group of Nobel laureates in Economic Sciences made significant contributions to this field with their significant works through which they enabled the development of methods that transformed economic analysis and contributed to a better understanding of complex economic processes.

**Ragnar Frisch and Jan Tinbergen (1969)** were awarded the first Nobel Prize in Economic Sciences for introducing mathematical methods into the analysis of economic phenomena. **Frisch**, the founder of econometrics, coined the term for the method he believed would ultimately establish

economics as a science by integrating theory, mathematics, and statistics. On the other hand, **Tinbergen** was one of the first economists to systematically use quantitative methods to analyze economic phenomena. He developed models to study the impact of economic policies on macroeconomic outcomes.

**Tjalling Koopmans and Leonid Kantorovich (1975)** were awarded the prize for applying econometrics to policies for the optimal allocation of scarce resources. **Koopmans** advanced the theory of general equilibrium and linear programming, while **Kantorovich** developed methods for resource optimization, including the theory of duality in linear programming.

**Trygve Haavelmo (1989)** laid the foundation for probabilistic methods in econometrics, enabling economic models to be treated as statistical ones. His work enhanced economists' ability to quantify the effects of economic policies while accounting for uncertainty and variability in data.

While Frisch and Tinbergen were pioneers in integrating mathematical and statistical tools into economics, their work laid the foundation for a more rigorous approach to economic analysis. They recognized the importance of quantitative methods in understanding economic relationships, using models to better capture the complexities of economic systems. Building upon this, Koopmans and Kantorovich extended these techniques to tackle optimization and resource allocation problems, offering more precise tools for addressing issues like efficiency and the best use of limited resources. Their work contributed to the development of operational research within economics, emphasizing the importance of mathematical optimization in resource management.

Haavelmo's focus on probabilistic methods marked a significant shift in economic modeling, as it introduced greater precision and clarity in analyzing economic data and forecasting future trends. By incorporating uncertainty and probability into models, Haavelmo bridged the gap between abstract economic theories and empirical realities, allowing for more accurate predictions and a deeper understanding of economic dynamics. This shift was instrumental in refining econometric methods and improving the ability to forecast real-world economic conditions.

Together, these laureates advanced the scientific rigor of economics, ensuring that quantitative analysis became a foundation for understanding economic behavior and guiding policy decisions. Their collective contributions transformed economics into a more data-driven

and mathematically sophisticated discipline, equipping economists with the tools to address the increasingly complex challenges of modern economies, from resource distribution to policy formulation and economic forecasting.

### 3.4. When cycles become depressions

The Great Depression, which posed a significant challenge in the 1930s, inspired a revolution in macroeconomic thinking. In response to the devastating economic downturn, a new generation of economists, including those from the fourth group of Nobel laureates in Economic Sciences, contributed significantly to the understanding of economic cycles and the effectiveness of policy interventions aimed at stabilizing economies. The perspectives of these economists contributed to the analysis of economic cycles and the effectiveness of policies for stabilizing the economy by expanding on existing theories and introducing new frameworks for understanding the dynamics of business cycles, offering valuable insights into the role of government and monetary authorities in managing economic fluctuations.

**Paul Samuelson (1970)**, in his influential work, expanded Keynes' theory of business cycles, demonstrating how economies have a natural tendency toward instability, driven by factors such as fluctuations in investment and consumption. He was also, perhaps, the most prominent global interpreter of Keynesian theory and business cycle policy. Samuelson's refinement of Keynesian ideas demonstrated that economic cycles were not just external shocks but also part of a broader, recurring pattern. He emphasized the importance of stabilization policies and the role of government in mitigating economic cycles through fiscal and monetary measures.

**Milton Friedman (1976)** advocated for monetary policy as key to economic stability. Known for his monetarist theory and critique of Keynesian economics, he argued that depressions are often the result of flawed monetary policies by central banks. Friedman's critique of government intervention in the economy, particularly through fiscal stimulus, was grounded in his belief that such policies often exacerbated economic problems. Instead, he advocated for monetary stability as the key to preventing depressions, focusing on controlling inflation and avoiding erratic changes in the money supply.

**James Tobin (1981)** investigated liquidity preferences and the impact of monetary policy on savings, investments, and the velocity of money. His portfolio theory, which emphasized the role of asset diversification in reducing risk, provided important insights into how individuals and businesses make economic decisions under conditions of uncertainty. Tobin's work illuminated how changes in interest rates, which are often the target of monetary policy, influence economic behavior, including the decisions to save, invest, and spend. His insights helped deepen understanding of the channels through which monetary policy impacts the broader economy.

**John Hicks (1972)** synthesized Keynesian and monetarist theories, developing models that analyzed the interaction of savings, investments, and monetary policy in economic stabilization. He argued that government policies could influence the economy through both fiscal and monetary channels, but he also acknowledged the importance of managing expectations and the potential risks of excessive intervention. Hicks' work laid the groundwork for later developments in economic theory that sought to reconcile different schools of thought in understanding economic stabilization.

**Robert Lucas (1995)** developed the theory of rational expectations, which posits that individuals make decisions based on rational forecasts of the future, using available information and economic models, thereby limiting the effectiveness of policies. This theory challenged traditional Keynesian models, which often assumed that policy interventions could have a predictable and lasting impact on economic outcomes. Lucas argued that if people anticipate government policies, they will adjust their behavior in ways that can limit the effectiveness of those policies, thereby reducing their potential impact on stabilizing the economy. His work highlighted the importance of considering how expectations and forward-looking behavior influence macroeconomic outcomes.

**Franco Modigliani (1985)** developed the life-cycle theory of savings, explaining how people plan consumption and savings throughout their lives. Modigliani argued that individuals smooth their consumption by saving during their working years and drawing down their savings in retirement, adjusting their behavior in response to changing income over time. Modigliani's theory offered a broader perspective on how economic cycles can be influenced by the decisions of individuals, rather than just short-term fluctuations in investment and government policy. His work advanced the understanding of consumer and investor behavior.

While these laureates share a commitment to understanding and mitigating economic cycles, their approaches reflect differing perspectives on the mechanisms of stabilization and policy effectiveness. Samuelson and Hicks underscore the importance of government intervention, while Friedman critiques its role, emphasizing monetary policy and the risks of mismanagement. Tobin's focus on liquidity and portfolio decisions complements Modigliani's insights into consumer behavior over time, providing microeconomic underpinnings to macroeconomic theories. Lucas's rational expectations framework challenges traditional policy approaches, arguing for the limited effectiveness of interventions in the face of forward-looking, informed decision-making by individuals. Collectively, their works provide a multifaceted view of economic cycles and the policies designed to address them.

### 3.5. The model builders

Understanding the economic system requires the construction of economic models. The following economists who revolutionized macroeconomic modeling have actually shaped contemporary macroeconomics, providing insights into the causes and solutions of economic crises, have been awarded the Nobel Prize in Economic Sciences.

**Richard Stone (1984)** was awarded for his contributions to economic science through the development of national accounting systems, which standardized the measurement of GDP, national income, and other economic variables, laying the foundation for international statistical standards. His work on national accounts later became the basis for the System of National Accounts (SNA), adopted by the United Nations and used by countries worldwide. His standardized approach allowed for more consistent and reliable economic measurements, fostering better comparisons across nations and more informed policy decisions. Stone's innovations in national accounting helped transform economic data collection, making it more systematic and globally applicable, which continues to serve as a foundation in economic analysis today.

**Gerard Debreu (1983)** developed the theory of general equilibrium, demonstrating the existence of general equilibrium in an economy through mathematical proofs, which became the foundation of modern mathematical economics. His contributions to mathematical economics

provided the rigorous foundation needed for modern economic theory, making general equilibrium theory a central part of economic modeling.

**Maurice Allais (1988)** contributed to the theory of general equilibrium by analyzing the fundamental principles of economic systems, including the impact of technology, social classes, and international relations. Allais's work highlighted the importance of understanding the complex interactions between various sectors of the economy and the factors that drive long-term economic change. His contributions to general equilibrium theory added depth and richness to the understanding of how economic systems function, showing that equilibrium does not solely depend on mathematical models but also on real-world, multi-dimensional factors.

**Wassily Leontief (1973)** developed input-output analysis, a model that quantitatively illustrates economic interactions between sectors, providing deeper insights into production processes and resource flows. Leontief's input-output model became a key tool for policymakers and economists to analyze the effects of changes in one sector on the entire economy. It also helped economists examine how shifts in demand, technology, or resource availability can impact different industries, making it essential for understanding inter-industry relationships and guiding economic planning.

**Lawrence Klein (1980)** was a pioneer in developing macroeconomic models for predicting economic trends and analyzing policies, integrating microeconomic data into aggregate models. Klein developed dynamic models of the economy that were capable of forecasting key indicators such as GDP, inflation, and unemployment. By bridging the gap between microeconomic behavior and macroeconomic trends, Klein's models became instrumental in guiding government policy decisions. His work demonstrated that by analyzing individual economic behavior and aggregating it to the macro level, policymakers could gain valuable insights into how the economy functions at a larger scale, enabling better policy formulation and economic management.

**Simon Kuznets (1971)** was awarded for developing methods for collecting and analyzing data that measure national income and GDP, enabling a better understanding of economic growth and structure. His most fundamental contribution to macroeconomic modeling was the construction of national income accounts, which became essential tools for analyzing long-term economic trends and understanding the

relationship between income, investment, and growth. His contributions allowed economists to track economic development and its impacts on different sectors and social groups, leading to a more nuanced understanding of economic growth patterns.

Although all these economists advanced the field of economic modeling, each focused on a different aspect of the economic system. Stone and Kuznets emphasized the importance of empirical measurement and standardization, providing the tools necessary to assess both national and global economic performance. Their work laid the foundation for economic data collection and analysis that continues to inform policy decisions today. Debreu and Allais, on the other hand, made significant contributions to theoretical modeling. Debreu's rigorous mathematical approach to general equilibrium set the stage for modern economic theory, while Allais broadened the scope of equilibrium theory to include systemic factors such as technology and international relations. Leontief's input-output analysis provided a practical tool for understanding inter-sectoral relationships, helping to quantify economic linkages and production processes. Klein's integration of microeconomic data into macroeconomic models enhanced the predictive power of economic forecasting, directly influencing policy decision-making by providing insights into economic behavior at both the individual and aggregate levels.

The laureates from this group, created a multifaceted framework for understanding complex economic systems, combining empirical measurement, theoretical models, and practical tools for analyzing economic dynamics. Their contributions remain foundational to contemporary economics, offering valuable insights into the causes of economic crises, the effectiveness of policies, and the structure of economic growth. Their work continues to inform economic theory and practice, shaping how economists and policymakers approach the management of modern economies.

### 3.6. Economic growth and development

Economic growth and development are key elements of modern society. Nobel laureates in Economic Sciences who focused on these topics have shaped the understanding of the long-term and structural aspects of development. The Nobel laureates who have contributed to this field

have greatly enhanced the understanding of the long-term drivers of economic growth and the complex structural factors that influence development. Their work provides both theoretical frameworks and empirical insights that continue to shape policy decisions on a global scale, helping to chart the path toward sustained prosperity for all.

**Robert Solow (1987)** was a pioneer of modern growth theory, developing a growth model that highlights technological progress as the key driver of long-term growth. While acknowledging the importance of capital and labor, Solow argued that sustained prosperity depends more heavily on technological innovation, as it enables economies to continually improve productivity without diminishing returns to capital. Solow's contributions have had profound implications for understanding how countries can achieve long-term growth and the role that innovation plays in shaping that trajectory.

**Theodore Schultz (1979) and Arthur Lewis (1979)** were awarded the Nobel Prize for their research on economic development, particularly the developmental challenges of the world's poorest countries. **Schultz** introduced the concept of human capital, emphasizing that investments in education, healthcare, and training are vital for improving productivity and fostering economic development, especially in resource-limited regions. By focusing on enhancing the skills and knowledge of the workforce, Schultz highlighted how human capital could drive long-term growth. **Lewis**, in turn, developed the dual-sector model, which analyzed the transition from traditional agricultural economies to industrial ones. His model explored how surplus labor from the agricultural sector could be absorbed by the industrial sector, promoting growth and structural change. Lewis identified the challenges of this transition, such as managing labor migration and addressing urban unemployment, while emphasizing the importance of it. Together they offered valuable insights into the role of education, health, and industrialization in the development of poorer nations, providing frameworks to guide policymakers in fostering growth and reducing inequality. Industrialization for boosting productivity and creating jobs.

**Robert Fogel (1993)** applied econometric methods to the actual experience of growth and development, using quantitative methods on historical data to show how such analyses can illuminate the factors of long-term growth and social change. Fogel's application of econometrics to the study of economic history allowed him to analyze how factors like technological advances, transportation systems, and social changes



influenced the growth patterns of societies over time. His work illuminated the ways in which historical factors—such as improvements in infrastructure or changes in social organization—can have long-lasting effects on economic development, offering valuable empirical evidence to support theories of growth and change.

**Gunnar Myrdal (1974)** examined development challenges in Asia, linking economic, political, and social factors. He emphasized the need for a comprehensive approach to development to reduce poverty. Myrdal emphasized the importance of understanding development not just through an economic lens, but through the broader context of social and political institutions. He argued that development is a multifaceted process that involves addressing not only economic factors such as industrialization and trade, but also social issues like poverty, inequality, and political instability.

While Solow laid the groundwork for understanding economic growth through technological progress, arguing that sustained growth relies heavily on advancements in technology rather than merely increasing labor and capital, Schultz and Lewis shifted the focus to the human and structural elements crucial for long-term development. Schultz emphasized the importance of investing in human capital, education, health, and skills, asserting that enhancing human potential leads to greater productivity and economic prosperity. In contrast, Lewis developed the dual-sector model, which explains the transition of economies from traditional agricultural sectors to modern industrialized ones, shedding light on the structural changes required to achieve sustainable development and reduce poverty.

Fogel introduced a quantitative historical perspective, applying econometric methods to analyze long-term economic trends and the role of factors such as nutrition, health, and institutional changes in driving growth. His research demonstrated how historical data could provide empirical insights into economic dynamics and challenged conventional wisdom about the causes of development and progress. On the other hand, Myrdal provided a more holistic approach by examining the interconnectedness of economic, social, and political factors. He argued that underdevelopment often stems from institutional weaknesses and policy failures rather than purely economic forces, advocating for comprehensive policy interventions to break the cycle of poverty and underdevelopment.

Together, these contributions present a comprehensive and multifaceted view of economic growth and development, integrating theoretical insights, empirical analysis, and policy applications. They highlight that achieving long-term prosperity requires a combination of technological progress, investment in human capital, structural transformation, and institutional reforms. Moreover, their work underscores the importance of addressing inequalities and ensuring that economic growth benefits all segments of society, offering valuable perspectives for policymakers and researchers seeking to tackle contemporary development challenges.

### 3.7. Financing investments that stimulate growth

Financial markets play a key role in allocating resources for investments that stimulate economic growth. Nobel laureates in Economic Sciences who have explored this topic have made significant contributions to understanding risk, returns, international trade, and market mechanisms. Their work has shaped the contemporary understanding of how investments can be optimized for growth, how financial markets operate, and how governments and businesses navigate the complexities of risk and returns to ensure long-term prosperity.

**Harry Markowitz (1990)** developed portfolio theory, providing investors with tools for diversification and minimizing risk while maximizing returns. Markowitz's work provided investors with the mathematical framework to allocate their assets optimally, reducing the negative impact of market fluctuations. This theory helped shift investment strategies from focusing on individual securities to considering the overall risk-return profile of an entire portfolio.

**William Sharpe (1990)** introduced the Sharpe Ratio, a measure of investment efficiency relative to risk, revolutionizing portfolio management. The Sharpe Ratio provided a measure of risk-adjusted return, enabling investors to make more informed decisions by comparing investments of varying risks. This innovation transformed the way portfolio management was approached, giving investors a clearer way to evaluate and manage risk.

**James Tobin (1981)** developed the "q" ratio to evaluate corporate investments, emphasizing the influence of market conditions on investment decisions. The q ratio, which compares the market value

of a firm's assets to the replacement cost of those assets, offered insights into how market conditions affect investment behavior. Tobin's work bridged macroeconomic theory with practical corporate finance, emphasizing how external market conditions influence corporate investment strategies and economic growth.

**Merton Miller and Franco Modigliani (1990)** demonstrated, through the Modigliani-Miller theorem, that a company's capital structure does not affect its value under perfect market conditions, company's capital structure—whether it is financed by debt or equity, does not affect its overall value. This groundbreaking theory offered a theoretical foundation for understanding corporate finance, illustrating that under idealized conditions, financial decisions related to debt and equity are irrelevant to a company's market value. This finding challenged traditional notions about capital structure and provided clarity on how financial markets function in an idealized world.

**Robert Merton and Myron Scholes (1997)**, together with Fischer Black, developed the option pricing model, which became foundational for modern finance. This model provided a systematic approach to pricing options and derivatives, helping investors manage financial risk more effectively. The Black-Scholes model revolutionized the way financial derivatives were valued and opened the door for the growth of complex financial products, which are now a central part of global financial markets.

**Bertil Ohlin and James Meade (1977)** were awarded for their contributions to the theory of international trade and investment flows, analyzing production factors and trade policies. Their work underscored the importance of comparative advantage in driving trade liberalization, offering key insights into how nations can leverage their strengths to foster economic growth through trade. Their research shaped the global economic framework, highlighting the link between trade policies and long-term development.

**Robert Mundell (1999)** developed the theory of optimal currency areas, which formed the basis for the creation of the euro and understanding international monetary relations. Mundell's theory provided insights into the economic dynamics that guide currency integration and exchange rate policies, influencing the design of monetary systems and contributing to global economic stability. His work on currency areas helped shape the economic foundation for the European Union's common currency.

**William Vickrey (1996)** developed auction theory and concepts related to pricing in the public sector. His work on auctions and pricing mechanisms has had a broad impact on resource allocation and public finance, influencing everything from government procurement to the allocation of telecommunications licenses.

**James Mirrlees (1996)** similarly to Vickrey, studied optimal taxation in the context of asymmetric information, providing a framework for designing equitable tax systems that balance efficiency with fairness. His work provided a framework for designing tax systems that balance efficiency and equity, showing how progressive taxation can achieve redistributive goals with minimal economic distortions.

While Markowitz and Sharpe revolutionized portfolio management by focusing on risk and return optimization, Tobin extended the analysis to corporate investment strategies influenced by market dynamics. Miller and Modigliani explored capital structure under idealized conditions, while Merton and Scholes provided groundbreaking tools for risk valuation in financial derivatives. Ohlin and Meade's emphasis on trade and investment flows contrasts with Mundell's focus on currency and monetary systems. Vickrey and Mirrlees addressed public-sector challenges, from auction mechanisms to tax equity.

These economists together offer a comprehensive framework for understanding the interplay between finance, investment, and economic growth, with practical implications across both private and public sectors.

### 3.8. Institutions of society: Their origins nad potential for change

It is impossible to understand the functioning of an economic system without understanding the institutions that support it. The institutions of society represent the fundamental organizational structures that shape our social, economic, and political interactions. Their origins, evolution, and potential for change are critical factors influencing the development of societies worldwide. The perspectives of the final group of Nobel laureates in Economic Sciences will provide deeper insights into these processes. These economists have offered profound insights into the evolution and significance of institutions, contributing to an understanding of how the institutional framework shapes economic outcomes and societal progress.

**John Nash (1994), John Harsanyi (1994), and Reinhard Selten (1994)** were jointly awarded the Nobel Prize in Economic Sciences. **Nash** developed the concept of Nash equilibrium in game theory, a concept that fundamentally changed how economists and game theorists understand behavior in interactive situations, analyzing how individuals in such contexts maximize their benefits. This became crucial for understanding market interactions and political negotiations.

**Harsanyi** expanded game theory by introducing Bayesian equilibrium, enabling the analysis of strategies under conditions of uncertainty and incomplete information. **Selten** investigated threats and credibility in repeated games, developing the concept of subgame perfect equilibrium, essential for understanding long-term strategic interactions.

**Douglass North (1993)** analyzed how formal and informal institutions impact economic growth. He is a laureate who most successfully described the historical evolution of social institutions. His concept of "institutions as the rules of the game" emphasizes the importance of secure property rights and reliable legal systems for economic prosperity.

**Robert Fogel (1993)** also contributed to understanding institutions and their impact on economic development. He used quantitative methods to analyze historical institutions, demonstrating how social norms and perceptions influence economic development. He highlighted that the abolition of slavery was driven by ethical changes, not just economic reasons.

The contributions of these laureates illuminate different dimensions of institutional analysis. Nash, Harsanyi, and Selten focused on the micro-level strategic interactions within institutional contexts, providing tools to predict and analyze individual and collective behavior. In contrast, North and Fogel offered macro-level perspectives, emphasizing the historical and structural evolution of institutions over time. While Nash and his peers concentrated on equilibrium and strategy, North and Fogel explored how institutions emerge, adapt, and transform under changing societal norms and economic pressures.

The last group of laureates provide a holistic view of institutions, bridging the gap between theoretical models of strategic behavior and empirical analyses of historical evolution. Their work highlights the indispensable role of institutions in shaping economic development and underscores the potential for societal progress through institutional change.

## 4. RESULTS AND DISCUSSIONS

This book review covers Nobel Prize laureates in Economic Sciences up to the 2000s, as the book was published in August 2000. Since then, 52 more economists have received the Nobel Prize in Economics for their various contributions in various fields. Among them are Daniel L. McFadden (2000) for his development of theory and methods for analyzing discrete choices, Daniel Kahneman (2002) for his work in behavioral economics, Paul Krugman (2008) for his research on international trade theory and economic geography and William D. Nordhaus (2018) for integrating climate change into macroeconomic analysis. The latest Nobel laureates in Economic Sciences are Daron Acemoglu, Simon Johnson, and James A. Robinson, awarded in 2024 for their research on how institutions are formed and their affect in shaping prosperity.<sup>4</sup>

What is essential to note about the author of this book is that rather than focusing on the specifics of certain ideas, the book emphasizes explaining the real-world applications of many of these ideas. By doing so, it successfully connects the Nobel laureates in Economic Sciences with the very goals of society. The author's approach is commendable in how it distills complex theories into accessible narratives, showcasing the practical relevance of economic ideas in addressing societal challenges such as inequality, growth, and institutional development.

However, while the book provides an invaluable overview of the contributions of Nobel laureates, it does leave room for potential improvement. For instance, the book's focus on Nobel Prize winners might come across as overly exclusive, potentially overlooking the impactful contributions of other economists who were not laureates but whose work has also significantly shaped economic thought. Incorporating references to such figures could have provided a richer and more nuanced understanding of the field.

Another potential shortcoming lies in the depth of detail presented. While the comprehensive nature of the book is undoubtedly one of its strengths, the sheer volume of information might be overwhelming for readers less familiar with economics. A more thematic organization or a focus on fewer key contributions could have improved accessibility.

Moreover, while the book succeeds in connecting theory to real-world applications, it occasionally stops short of critically evaluating the

limitations or contested aspects of the featured theories. Including a more balanced perspective that highlights both the strengths and critiques of these economic contributions could have further enriched the narrative.

Overall, this book provides valuable insights into how Nobel laureates in Economic Sciences have contributed to the global economy as we know it today. It bridges the gap between complex economic theories and their societal implications, offering a resource that is both informative and inspiring. With minor adjustments to broaden its scope and refine its critical analysis, the book could serve as an even more comprehensive guide to understanding the evolving field of economics.

## 5. CONCLUSION

This book review explores the ways Nobel laureates in Economic Sciences have shaped modern economic thought and practice, as presented in Marilu Hurt McCarty's work, "Nobel Laureates: How the World's Greatest Economic Minds Shaped Modern Thought." By dividing the laureates into thematic categories based on their contributions, the book provides an organized framework for understanding the evolution of economic ideas and their impact on society. The thematic categorization aligns with the book's structure, offering a coherent perspective on the progression of economic theories and their practical applications.

One of the book's strengths is its emphasis on the practical relevance of the laureates' theories, showing how their work addresses real-world problems such as economic growth, inequality, financial markets, and institutional development. This approach ensures that the work transcends academic discourse, instead positioning economics as a tool for understanding and resolving pressing societal challenges. By focusing on these applications, the book successfully connects the contributions of Nobel laureates to broader societal goals, reinforcing their significance in navigating contemporary global issues.

Nobel laureates in Economic Sciences, through their research and theories, reflected the challenges and issues specific to their time, providing innovative solutions that have shaped modern economic thought and practice. Their ideas stemmed from personal experiences, focused on a fundamental question: how does a particular event, action, or policy affect the well-being of ordinary people? (McCarty, 2000)

The spirit of the times played a key role in their work, defining the economic problems they addressed and determining why their contributions were recognized with the Nobel Prize. Each era brought specific challenges that demanded new perspectives, and these economists, driven by a genuine concern for human well-being, offered solutions that continue to shape our daily lives even to this day.

In conclusion, McCarty's book offers a compelling narrative that not only illuminates the intellectual achievements of Nobel laureates but also underscores the dynamic interplay between economic theory and societal progress. It effectively showcases how the ideas of these eminent economists have not only shaped their respective fields but have also contributed to solving the enduring challenges of their times. The book serves as both a tribute to the transformative power of economics and a reminder of its enduring relevance in understanding and addressing the complexities of the modern world.

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# 7.

## UNDERSTANDING SOCIAL ENTREPRENEURSHIP – CASE STUDY OF UNIVERSITY OF DONJA GORICA

Jovana Popovic, Katarina Scepanovic





# UNDERSTANDING SOCIAL ENTREPRENEURSHIP – CASE STUDY OF UNIVERSITY OF DONJA GORICA

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## ABSTRACT

In the modern era, individuals belonging to different generations inhabit a world that is, at the very least, uncertain in its fundamental aspects. In order to comprehend this world, it is essential to have developed social and emotional intelligence. It is becoming increasingly evident that environmental and social issues are prevalent in society, and it is therefore of paramount importance to gain an understanding of them.. However, it is important to recognise that entrepreneurs are not solely limited to those with expertise in economics. This study examines the role of the University of Donja Gorica (UDG) in shaping students' perceptions of social entrepreneurship. Through a survey of 412 students from various faculties, the research assesses how university-led initiatives influence their entrepreneurial mindset. Results show that 61.41% of students are familiar with social entrepreneurship, while 86.2% recognize that UDG actively promotes it. Findings indicate that extracurricular programs, such as the Ideas and Character project and master classes, significantly impact students' readiness for social enterprise development. These insights highlight the importance of integrating social entrepreneurship education across all faculties to ensure a more comprehensive and interdisciplinary approach.

**Keywords:** social entrepreneurship, innovation, UDG students, uncertainty, change

## 1. INTRODUCTION

Studying in a modern society is becoming increasingly challenging. Meeting the needs of modern society is a daily concern in the business environment. To survive in such a market, you need to be as innovative as possible, ready for uncertainties and ready to recognise opportunities.

The purpose of this paper is to investigate the attitude of the population of UDG students towards social entrepreneurship. The objective of this study is to ascertain the extent to which UDG fosters the development of socially responsible citizens within the global community, particularly in the context of social entrepreneurship.

Regarding that, the hypothesis of the paper is that the diverse range of extra-curricular activities available at UDG provides students with the opportunity to gain a deeper understanding of the world around them. We conducted our empirical research at the University of Donja Gorica, among students from various faculties. The multidisciplinary approach is the primary reason for the discussion of this topic among UDG students. UDG provides its students with a diverse range of activities during their BSc, MSc and PhD studies. This student experience offers numerous possibilities and opportunities for their future professional careers.

The second part of the paper will concentrate on defining social entrepreneurship and social innovation. Subsequently, the third part will entail an interpretation of the methodology employed and the acquisition of data. In the concluding section, the findings will be presented and analyzed.

As of the present moment, the Republic of Montenegro is home to a total of eight institutions of higher education. This number includes four universities and four independent faculties. Higher education institutions wield a considerable influence over the demographic composition of a nation. During their academic pursuits, students have the opportunity to cultivate their character, confront reality, and raise global awareness. It is imperative to recognise the pivotal role that education plays in shaping attitudes and behaviours. Educating individuals effectively is a crucial factor in influencing their perceptions and actions, particularly in contexts where personal influence is significant.

The University of Donja Gorica is an institution of higher education that

has been identified as fostering an entrepreneurial spirit and critical thinking among its students. The uniqueness of university is mainly in the process of decision making, unique style of functioning and study model. The study model itself represents Professor's equation  $S$  (study) equals  $z$  (knowledge) multiplied by  $i^2$  (intensity of life squared). Recognised as an entrepreneurial university, promoting entrepreneurial thinking and innovation, UDG is a strategic partner of Arizona State University.

A partnership between ASU and UDG has resulted in the provision of a university curriculum that is designed to empower students. The curriculum draws upon materials from the Cintana Education Network, with the overarching objective being the preparation of students to become global participants in the world.

## 2.LITERATURE OVERVIEW

### 2.1. SOCIAL ENTREPRENEURSHIP – DEFINITION AND CONCEPT

Entrepreneurship is the main catalyst of society and human civilisation. However, market conditions have developed a need for social entrepreneurship over time. Traditional entrepreneurship nurtures the free spirit of the individual who is willing and ready to make a difference in society. Entrepreneurs have the skills and knowledge to take advantage of every situation around them. Entrepreneurship is characterized by a change-behavior that results from an inclination and ability to challenge conventional thinking, to behave differently from those maintaining the status quo, and to exhibit considerable confidence when effecting the change.

In the last 10 years, social entrepreneurship has highlighted the impact of education and practical exposure to entrepreneurship on entrepreneurial intentions. Authors Herlina et al. (2020) agrees that the university must pay special attention to the entrepreneurial learning process, for example by conducting real practice in the field.

Students may identify a number of social issues that require attention, including the lack of job opportunities, the adverse effects of contemporary business practices on the environment, social inclusion, and the necessity for quality and equitable education for all. Additionally, concerns pertaining to food safety and digital writing may also be

considered.

Social entrepreneurship has emphasized the social outcome of business activities that aim at value creation beyond profit maximization (Grilo & Moreira, 2022).

Sampaio & Sebastiao (2024) define social entrepreneurship as a primary goal of addressing social issues and creating positive change in society through entrepreneurial ventures. Social value is generated, not personal or shareholder wealth. Social entrepreneurship is about seizing new opportunities to serve a social mission, driving continuous innovation, adaptation and learning. Social entrepreneurs act boldly, often without being limited by current resources, and exhibit a heightened sense of accountability to the constituencies served and the outcomes created.

Social entrepreneurship should be understood as a process of creating businesses with the main aim of improving the current social situation, addressing current social changes and creating social value. Being a successful entrepreneur means being able to identify the opportunities and needs of society and respond correctly to market demand. The student population of UDG (BSc students) should be prepared to embrace change and be ready for the challenges that lie ahead. Those who are leaders in innovation should be among them.

In this context, social innovation can be defined as the final product of social entrepreneurs and the process of its creation. The concept of social innovation encompasses a crucial aspect: the emergence of novel approaches to driving social change. This paradigm is responsible for the reinvigoration of social dimensions inherent to all forms of innovation (Grilo & Moreira, 2022).

Social innovation is defined as strategies that provide sustainable solutions to community issues, focusing on social, economic, and environmental dimensions Zapata-Aguilar (2024).

As previously stated, the most significant social issue is the lack of job opportunities. Given that the research will be conducted with undergraduate students, it is reasonable to assume that they are contemplating their future career paths. Currently, the market is demanding a greater range of skills and abilities from new employees. The aforementioned skills could be acquired through participation in a multitude of activities organised by UDG. These activities encourage



lateral thinking and the utilisation of diverse sources of information. On occasion, individuals may be aware of the issue at hand but lack the requisite knowledge to accurately identify it or implement an appropriate course of action. Such an education is encouraging and encourages students to push their limits, ultimately leading to the creation of social innovation.

## 2.2. THE ROLE OF UNIVERSITIES IN FOSTERING SOCIAL ENTREPRENEURSHIP

As previously mentioned, young people are instrumental in effecting societal change. It is imperative that the time allocated to academic pursuits is utilized for the advancement of knowledge and understanding.

Universities have the capacity to foster a culture of social entrepreneurship. This may be achieved by three mechanisms. Firstly, universities are in a position to allocate resources in support of this endeavor. Secondly, the provision of a diverse program of academic study may be instrumental in this process. Thirdly and perhaps most crucially, active student involvement in these programs is likely to enhance students' skills and mindset. The result of these initiatives will be students who have been prepared to become socially conscious entrepreneurs. Such individuals should be capable of contributing to both sustainable development and societal well-being (Chauhan, Satsangi, & Kumar, 2024).

It is vital that universities are at the vanguard of recognizing change and implementing it, in order to ensure that students are equipped with the necessary skills to adapt to it.

Social entrepreneurship can be considered as a manifestation of such transformative initiatives.

The role of universities in fostering social entrepreneurship could be demonstrated through the following means:

- Integrating educational programs
- Collaborative methodologies
- Key strategies – challenge based learning

- Active learning methodologies
- Emotional intelligence
- Communication skills

It is imperative that universities commit to ongoing development and enhancement of their educational programs, with the objective of ensuring that their students receive the highest caliber of education. Social entrepreneurship is defined as a scientific discipline that integrates multiple scientific fields to create new knowledge.

It is imperative that students receive an education that fosters critical thinking and creativity.

Villanueva-Paredes et al. (2024) have said that a plethora of international studies have demonstrated that training programmes – also referred to as ecosystems – developed by universities contribute to fostering an entrepreneurial and innovative culture, thereby driving transformation towards social development. The social challenges that were addressed by the study included social innovation, collaboration with external entities, active learning methods and student engagement in social challenges. The results of the paper indicate that future university programmes should be enhanced by incorporating social and emotional intelligence. This would allow students to develop their awareness and to continuously hone their skills in improving society and contributing to it.

It is imperative that young students are provided with the opportunity to acquire knowledge and facts that are pertinent to the contemporary era. This era compels us to become more cognizant of our actions and their consequences. Universities have been identified as optimal institutions for encouraging unconventional thinking, facilitating the development of skills and abilities, and inspiring societal transformation. Consequently, it is incumbent upon universities to perpetually refine their educational programs and assume a proactive role in driving positive change within society.

### 3. METHODOLOGY OF THE RESEARCH

For the purpose of this study, research was conducted on a sample of students from the University of Donja Gorica. The focus of the research was to assess the impact of activities such as the "Ideas and Character" project, master class sessions, and partnership with ASU on the development of competencies for social entrepreneurship. To achieve this, a quantitative survey was conducted, consisting of closed-ended questions using a Likert scale (1–5), as well as several open-ended questions that allowed respondents to express additional opinions on social entrepreneurship. The questionnaire was designed to assess students' awareness of the concept of social entrepreneurship, their perspectives on key challenges and opportunities in this field, and their perception of the role of the University of Donja Gorica in fostering entrepreneurial thinking. The questionnaires enabled a detailed analysis of students' perceptions regarding the extent to which extracurricular activities at UDG contribute to their development as socially responsible individuals and global citizens. The research sample included 412 students from various faculties at UDG, with particular attention given to covering students from different years of study. The data was analyzed using descriptive statistics and cross-tabulation techniques to identify differences in perceptions among students from different academic disciplines.

This section presents a descriptive analysis of the research conducted. Of the 412 surveyed students, 198 (48.1%) are female and 214 (51.9%) are male. This indicates a nearly equal distribution of the two genders in the sample.

**Table 1.** General demographics (gender)

Gender	Frequency
Female	198
Male	214
Total	412

The majority of the surveyed students are enrolled in the Faculty of Information Systems and Technology (35.19%), the Faculty of International Economics, Finance and Business (16.26% are enrolled in the general course and 7.77% are enrolled in the course Entrepreneurship, Management and Business), the Faculty of Polytechnics (14.08%), the Faculty of Law (7.52%), and the Faculty of Sport Management (6.07%). The remaining students were enrolled in faculties including the Faculty of Applied Sciences (courses in Psychology, Electrotechnics, Geodesy and Mathematics), the Faculty of Art, the Faculty of Design and Multimedia, and other faculties.

The survey was conducted on a sample of students enrolled in bachelor's degree program. The majority of the students in the sample were in their first year of studies, representing 53.6% of the total sample. Second-year students constituted 29.9% of the sample, while third-year students comprised 16.5%.

**Table 2.** General demographics (level of studies)

Level of studies	Frequency
First year	221
Second year	123
Third year	68
Total	412

## 4. RESULTS

Table 3 presents the frequencies and percentages of students who are familiar with the term "social entrepreneurship" and those who are not, classified by their academic disciplines. Of the total sample, 61.41% of the surveyed students have indicated that they are aware of the concept of social entrepreneurship, while 38.59% have stated that they are not.

As illustrated in Table 4, the Faculty of International Economics, Finance and Business has the highest percentage of students who are familiar with the term "social entrepreneurship." In fact, 79.10% of general course students and 78.13% of Entrepreneurship, Management and Business course students indicated that they know this term. Furthermore, a significant number of students from the Faculty of Law (67.74%), Polytechnics (63.79%) and Psychology (60.87%) indicated that they were aware of the concept of social entrepreneurship. However, when students from the Geodesy department were included in the analysis, none of the surveyed students reported being informed about social entrepreneurship.

Based on the provided information, it can be concluded that the majority of surveyed students are familiar with the concept of social entrepreneurship, which is one of the key concepts socially responsible individuals should understand. Furthermore, the research revealed that 86.2% of students who indicated familiarity with the concept of social entrepreneurship recognized that the University of Donja Gorica promotes social entrepreneurship. Additionally, among the surveyed students who indicated familiarity with the concept of social entrepreneurship, 61.7% rated the extent to which UDG's unique study model encourages students to engage more in social entrepreneurship with a score of 3 or higher on a scale from 1 to 5, where 1 is the lowest and 5 is the highest value.

**Table 3.** Descriptive statistics for the responses for the question: „Do you know what social entrepreneurship is?“

FACULTY	YES	NO
FIST	79	66
FMEFB	53	14
FMEFB - PMB	25	7
Polytechnics	37	21
FPN	21	10
FSM	12	13
FKT	4	5
FPRN - Electrotechnics	3	4
FPRN - Psychology	14	9
FPRN - Geodesy	0	5
FU	2	3
Other faculties	3	2
<i>Total</i>	<b>253</b>	<b>159</b>

The results of the survey indicate that the majority of students surveyed believe that changes are needed in today's society and that social entrepreneurship can be a sustainable solution to social and environmental problems. Of the total 412 surveyed students, 369 mentioned that there is a need for change in today's society. Among them, 303 believe that social entrepreneurship can be a sustainable solution to social and environmental problems. Furthermore, among the 369 students who perceive that today's society needs changes, 313 see social entrepreneurship as a necessity of modern society. The minority, comprising 43 students, which is 10.44% of the surveyed students, believes that today's society does not need changes.

Among the students who identified social entrepreneurship as a potential solution to social and environmental problems, 70% expressed interest in participating in knowledge and skills development workshops. Based on this information, it can be concluded that students of the

University of Donja Gorica, as true representatives of responsible global citizens, recognize the need for change in modern society as well as the importance of social entrepreneurship as a key factor in driving these changes.

The research indicates that 37% of students perceive the primary focus of social entrepreneurship to be the creation of a sustainable society and the improvement of living conditions. A notable proportion of students (27%) view the resolution of current societal issues as the core objective of social entrepreneurship. Conversely, a smaller proportion of students (19% and 17%, respectively) believe that social entrepreneurship is primarily concerned with driving innovation and empowering communities.

Students of the University of Donja Gorica, as representatives of young people with a profound understanding of the world around them, demonstrate a solid comprehension of the challenges faced by social entrepreneurs. The data on students' views on the main challenges for social entrepreneurs is as 37% identify people's resistance to change as the main problem facing social entrepreneurs today. Almost equal proportions of students see lack of funding (31%) and limited access to resources (32%) as the main problems for individuals engaged in social entrepreneurship.



**Figure 1.** Main challenges for social entrepreneurs

When asked to assess the importance of the role that universities should play in promoting social entrepreneurship, students were presented with

a scale from 1 to 5, with 1 indicating that universities have no influence in promoting social entrepreneurship and 5 indicating that they have a significant influence. As illustrated in Table 4, the majority of students ranked the importance of the role of universities between levels 3 and 4. This indicates that students perceive the role of universities to be important in promoting social entrepreneurship, but that they also understand that there are other important factors.

Table 4 indicates that 341 of the 412 surveyed students recognize that the University of Donja Gorica promotes social entrepreneurship. The students surveyed who recognize the importance of the role that universities should play in promoting social entrepreneurship are also those who have rated this role with a level 3 and above. The majority of students who recognized that UDG promotes social entrepreneurship also rate the extent to which UDG's unique study model encourages students to become more involved in social entrepreneurship as level 3 out of 5 possible levels.

Additional analysis revealed that students who rated the role that universities should play in promoting social entrepreneurship with scores of 4 and 5 particularly emphasized the importance of UDG's partnership with ASU and the projects students undertake as innovation catalysts. Specifically, 52.2% of students who rated the role that universities should play in promoting social entrepreneurship with a score of 4 out of 5 rated the importance of the partnership with ASU with a score of 4 and 5. Among students who rated the role that universities should play in promoting social entrepreneurship with a score of 5, this percentage increases to 59.7%. Additionally, 50% of students who assigned a score of 4 out of 5 to the role of universities in promoting social entrepreneurship rated the importance of student projects with scores of 4 or 5. Among students who rated the role that universities should play in promoting social entrepreneurship with a score of 5, this percentage increases to 61.1%.

A smaller proportion of students, 71 out of 412 surveyed students, or 17.23%, indicated that they did not recognize that the University of Donja Gorica promotes social entrepreneurship. The majority of this group of students also rated the extent to which UDG's unique study model encourages students to become more involved in social entrepreneurship at level 3 out of a possible 5.

In conclusion, it can be stated that students perceive the importance of universities in promoting social entrepreneurship and that the University



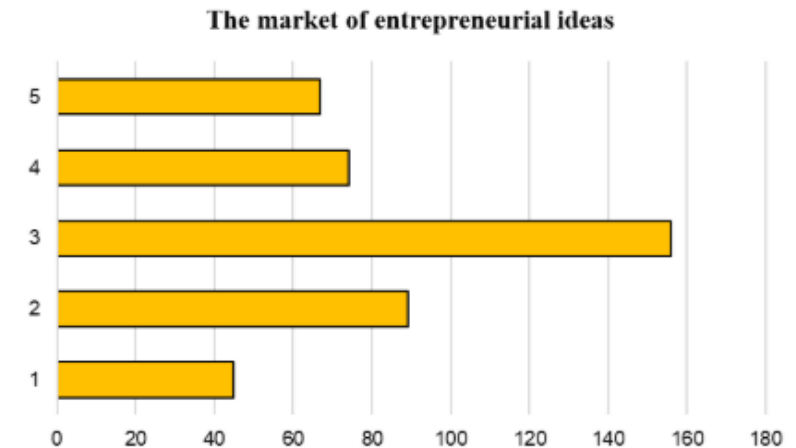
of Donja Gorica, through its unique study model, encourages students to become more involved in social entrepreneurship to a significant extent.

**Table 4.** Student perceptions of universities and UDG's study model as supportive factors for social entrepreneurship

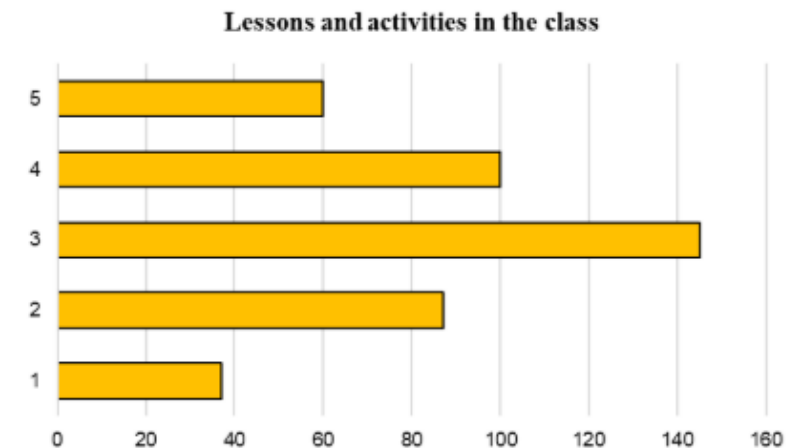
Do you recognize that UDG promotes social entrepreneurship?		What do you think is the role that universities should play in the promotion of social entrepreneurship?					Total
		1	2	3	4	5	
No	1	4	1	4	1	0	10
	2	2	2	4	2	1	11
	3	1	5	10	7	5	28
	4	0	0	2	7	2	11
	5	3	1	3	0	4	11
	<b>Total</b>	10	9	23	17	12	71
Yes	1	7	5	16	13	18	59
	2	1	8	27	25	7	68
	3	1	5	56	41	9	112
	4	0	4	24	31	8	67
	5	1	2	3	11	18	35
	<b>Total</b>	10	24	126	121	60	341
Total	1	11	6	20	14	18	69
	2	3	10	31	27	8	79
	3	2	10	66	48	14	140
	4	0	4	26	38	10	78
	5	4	3	6	11	22	46
	<b>Total</b>	20	33	149	138	72	412

The data presented above allows us to infer how students perceive the role of certain activities at the University of Donja Gorica in fostering innovation. It is evident that the majority of students rate the aforementioned activities as innovation catalysts, with an average score of 3 on a scale from 1 to 5. Additionally, the activity that the majority

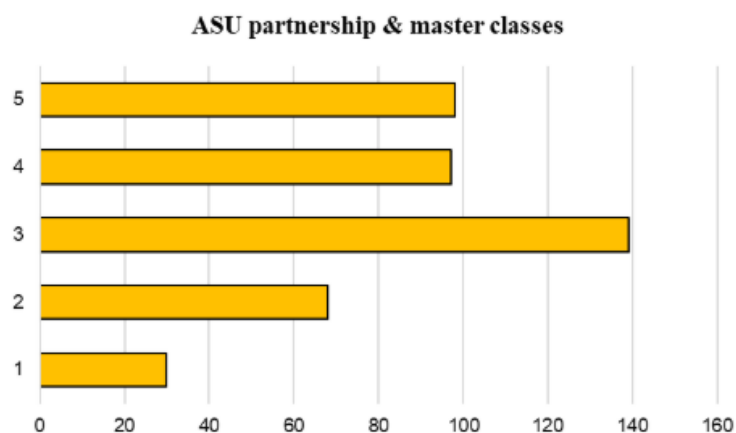
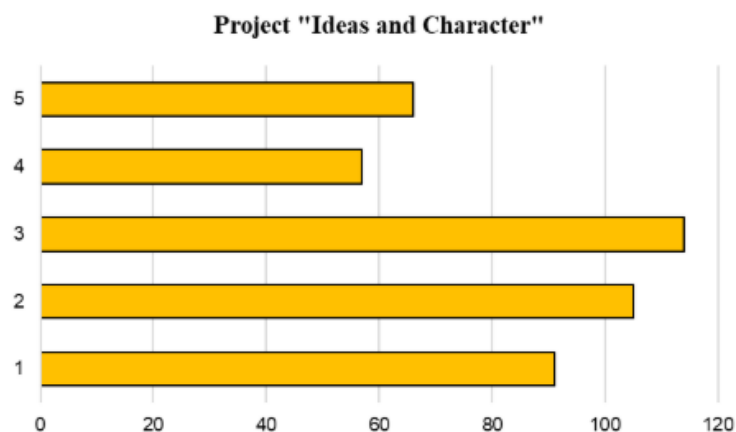
of students rated highly in terms of its ability to act as a catalyst for innovation is also the "Ideas and Character" project, which is organised every semester.



**Figure 2.** The view of students on The market of entrepreneurial ideas as an innovation catalyst



**Figure 3.** The view of students on the lessons and activities in the class as an innovation catalyst



**Figure 6.** The view of students on the ASU partnership and master classes as an innovation catalyst

## 5. DISCUSSION

The findings suggest that students from faculties with a strong business and management focus, such as the Faculty of International Economics, Finance and Business and Faculty for Information Systems and Technologies, exhibit the highest awareness of social entrepreneurship. This is likely due to their curriculum, which integrates entrepreneurship-related content and exposes students to real-world business challenges. Similarly, the relatively high awareness among law and polytechnic

students may stem from interdisciplinary exposure to economic and societal issues. In contrast, students from faculties with less direct engagement in business-related subjects, such as Geodesy, reported significantly lower awareness. This highlights a potential gap in the integration of social entrepreneurship principles across all academic disciplines at UDG. Furthermore, a significant proportion of students acknowledged UDG's role in promoting social entrepreneurship. However, some students rated its influence lower, suggesting potential areas for improvement. One possible explanation is the variation in emphasis on entrepreneurial education across faculties. Additionally, extracurricular engagement may vary among students, leading to different perceptions of the university's impact. Those who actively participate in initiatives such as the Ideas and Character project or master classes may perceive a stronger influence compared to students who are less involved.

Furthermore, 37% of students identified resistance to change as a primary challenge for social entrepreneurs. This finding suggests a need for greater emphasis on fostering adaptability and problem-solving skills among students.

Another important observation is that 70% of students who see social entrepreneurship as a solution to societal problems are interested in participating in relevant workshops. This indicates a strong demand for practical, hands-on learning experiences, suggesting that the promotion of existing workshops and events at UDG could be increased. Raising awareness about interactive opportunities, such as mentorship programs, incubators, and real-world projects, could further enhance students' engagement and practical knowledge.

Another key insight is the role of UDG's partnership with Arizona State University (ASU) in shaping students' perceptions of social entrepreneurship. Students who rated UDG's influence more highly often highlighted the value of ASU-powered initiatives, such as master classes and access to international resources. However, the impact of these opportunities appears to be uneven across faculties, suggesting that greater efforts could be made to integrate ASU's entrepreneurial approach into a wider range of academic programs. Expanding interdisciplinary collaborations and increasing student participation in ASU-supported projects could further enhance entrepreneurial competencies across different fields of study.

Overall, the results underscore the importance of a holistic approach

to fostering social entrepreneurship. While UDG plays a significant role in promoting this mindset, there are opportunities to strengthen the integration of social entrepreneurship education across all faculties, ensuring that students from diverse academic backgrounds develop the skills necessary to contribute meaningfully to society.

## 6. CONCLUSION

The students at the UDG are regarded as proactive individuals, prepared to face the challenges of an uncertain professional future. The distinctive study model provides students with the requisite knowledge and skills.

In the context of contemporary society, which is undergoing constant change, it is of the utmost importance to gain an understanding of the needs and desires of society at large. Those who are able to adapt to the ever-evolving pace of modern life will undoubtedly gain a competitive advantage.

Social entrepreneurship represents a potential solution to a number of contemporary societal issues, particularly in Montenegro. The provision of students with the requisite knowledge and skills, coupled with the implementation of effective teaching methodologies, can facilitate the development of a generation of socially conscious and enterprising individuals.

The resolution of acknowledged social issues is contingent upon the initiation of change by the individuals concerned. Following an extensive research project, it was determined that all students would be empowered to effect change. Perhaps the most significant outcome is that students are aware of the part played by universities in the dissemination of knowledge and in the promotion of awareness of socially pertinent matters.

To further enhance the role of universities in fostering social entrepreneurship, institutions like UDG could expand interdisciplinary initiatives, ensuring that students from all academic backgrounds gain exposure to entrepreneurial concepts. Increasing collaboration with external partners, such as Arizona State University, and integrating real-world case studies into curricula could strengthen students' practical understanding.

Additionally, universities should consider implementing more structured mentorship programs, incubators, and networking opportunities that connect students with successful social entrepreneurs. Future research could explore the long-term impact of such initiatives on students' career choices, as well as examine how different pedagogical approaches influence their entrepreneurial mindset.

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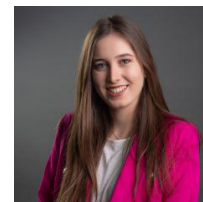
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