



MEASURING GLOBALIZATION: ANALYZING INTERNATIONALIZATION OF HIGHER EDUCATION (IOHE) THROUGH STEM EDUCATION IN PAKISTAN

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ABSTRACT

The concepts of 'internationalization' and 'globalization' are closely intertwined, impacting both tangible and intangible aspects of higher education. Internationalization refers to the internal transformations that occur within an educational setting as a result of frequent cross-border interactions within a local governmental system. Currently, developing countries like Pakistan are adapting and shaping their higher education systems in response to the global knowledge economy but neglecting the introduction of STEM education in the areas of social sciences like mathematics, statistics, entrepreneurship, IT, and other courses that are considered the need of time may leads to lack social scientist's ability to estimate & forecasting and critically evaluate the situations as these deficiencies lead to reduce the cognitive skill of the workforce. This qualitative study employed Wallenstein's World System analysis framework to examine student mobility and educational policy aspects in Pakistan critically. The findings suggest that the internationalization of higher education may lead to unequal exchange of educational services between core and peripheral countries in the global system.

KEYWORDS: Internationalization of Higher Education (IoHE), STEM (Science, technology, engineering, and mathematics), Globalization, World-System Analysis (WSA), Student Mobility, and Educational Policy.



INTRODUCTION:

Globalization is a contemporary trend that describes the shortened distances between nation-states and their interdependence of culture, economies, goods, and ideas. This growing global mobility has impacted various aspects of each state such as health, climate, economy, and education. The international collaboration in the educational dynamics has given rise to the 'internationalization' of higher education which is greatly influenced by each country's policies, programs, and initiatives. Notably, the terms 'globalization' and 'internationalization' are interconnected concepts that have affected the material and immaterial dimensions associated with the education process (Andone, 2021). Globalization, on the one hand, represents the obscuring of economic and cultural borders between nations through the exchange of services and extreme worldwide trade, including in the field of education (Sharipov, 2020). On the other hand, internationalization focuses on the internal dynamics and alterations in the educational environment due to the frequency of cross-border interactions within a national system. Globalization is portrayed as an array of forces while internationalization is viewed as the strategy of policymakers to shape the educational environment (Tight, 2021). At large, globalization comprehends the world system as a powerful outlook in a way that modernization, industrialization, and urbanization clustered together for an effective higher education system, whereas else, internationalization happens to occur at a university level (Strielkowski et al., 2021) and comprises of policies and regulations set by the academic institutions and authorities to cater the global educational space (Tight, 2021).

The responses to this internationalization differ from country to country according to their national interests and context (Hsieh, 2020). This is the reason why a significant number of developing nations, including Pakistan, face substantial challenges in meeting the demands of international higher education standards. Pakistan has liberally adopted internationalization policies of higher education by establishing global research collaboration, internationally funded educational programs, and recruitment of international students and faculty (Khalid et al., 2017). For this purpose, the recently established, key-player body of the Higher Education Commission (HEC) works on mapping of tactical plans and policies for the internationalization of higher education in Pakistan (Mughul & Pekkola, 2009).

RELEVANCY WITH SDGS:

The internationalization of higher education, in the era of globalization, can be a key source to achieve the United Nations Sustainable Development Goals (SDGs). The attainment of SDGs would work as a catalyst for developing the atmosphere of internationalization of higher education since the main goal of internationalization is to enhance the global society through international research, educational services, and commitments (Ramaswamy et al., 2021).

For instance, SDG 4 'Quality Education' advocates for universal post-secondary education, particularly university education, to support human formation; lifelong learning; knowledge and skill building, and innovation that may contribute to the attainment of the rest of the SDGs (Chankseliani & McCowan,



2021). Similarly, the internationalization of higher education enables the achievement of SDG 5 'Gender Equality' by detecting gender gaps in Higher Education Institutions (HEIs) and their impact on policy-making, teaching, and learning to enhance female students' mobility. The inclusive campuses and environment increase female participation in higher education which may be hindered due to harassment or assault cases (UNESCO IESALC, 2023). Thus, the achievement of SDGs and the development of the internationalization of higher education go hand-in-hand in recent times of globalization.

LITERATURE REVIEW:

Internationalization of Higher Education (IoHE) is considered to be an essentially unavoidable means of progress in the context of globalization and is a common goal of a majority of the countries in their Higher Education policies. This internationalization is a growing challenge in the global knowledge economy due to which many developing countries, including Pakistan, strive to develop their higher educational system. The existing literature gives valuable insight into the dimensions and trends of IoHE.

Elements of Internationalization of Higher Education (IoHE):

The term 'globalization' is frequently used to imply the reduction in national powers and diversity, while the notion of 'internationalization' is used about activities involving the crossing of international borders. As a result, a variety of phenomena, including the exchange of information, physical mobility, and other forms of collaboration are covered concerning IHE (Teichler, 2017). The field of international education developed in a way to generate income, improve reputation, and exercise soft power. The key outcomes of the internationalization drive in higher education over the past 30 years have been the mobility of students, researchers, programs, and paradigm change from collaboration to competition (De Wit & Deca, 2020). The three significant indicators of internationalization that stand out among the numerous others are the internationalization of student flows, transfer of institutional models, and expansion of publications (Alsharari, 2019).

International Student Mobility:

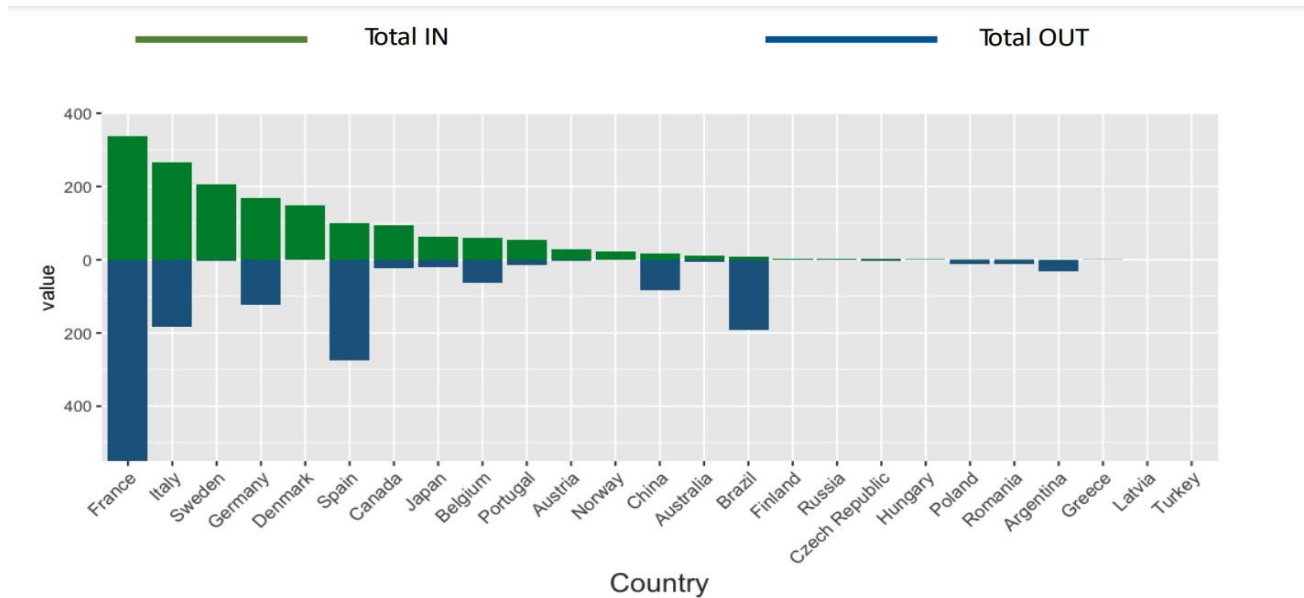
Worldwide academic mobility is defined as the international movements of individuals including students, researchers, and academicians; resources; ideas, and information (Shen et al., 2022). According to the UNESCO Institute of Statistics "Internationally mobile students are individuals who have physically crossed an international border between two countries to participate in educational activities in the country of destination, where the country of destination of a given student is different from their country of origin. (UNESCO Institute for Statistics, n.d.)"

This International student mobility can be divided into 'Outbound Mobility Ratio' and 'Inbound Mobility Ratio'. From an understanding of the nation and institution of "origin" or "sending", any student moving to another country is considered as outbound mobility, UIS defines outbound mobility as the "Number of students from a given country studying abroad, expressed as a percentage of total

tertiary enrolment in that country. (UNESCO Institute for Statistics, n.d.)” Where else, inbound mobility is reflected as the “destination” or “receiving” institution, which is defined as “Number of students from abroad studying in a given country, expressed as a percentage of total tertiary enrolment in that country. (UNESCO Institute for Statistics, n.d.)” by UIS. All records available on datasets indicate that the “in-out ratio” differs significantly between nations (Teichler, 2017). In 2018, the number of internationally mobile students worldwide passed 5.6 million, with Asia and Oceania accounting for half of them. The majority of foreign students have traditionally been drawn to English-speaking, western nations like the US, UK, and Australia, on the other hand, students from China and India continue to be the most likely to be in outbound mobility (Guillerme, 2021).

The recent global data of total in-bound and out-bound mobility can be understood through the following figure-1:

Global Inbound and outbound Ratios.



Source: Guillerme & T.I.M.E, 2023



Higher Educational Policies:

Higher education research has been greatly influenced by the notions and frameworks brought by globalization and internationalization which has influenced the development of Higher Education Policy and Practice (Tight, 2021) The state's policy, which determines the political and economic issues at the national level has now adopted to the concepts of Internationalization of Higher Education as its main focus, where the public and private universities are evolving into global players by emulating the patterns observed in the policy-making departments (Strielkowski et al., 2021).

If we analyze the effect of IoHE in Pakistan then we come up with the fact that dual results are observed as somewhere, IoHE is aided while somewhere it hindered national policies by prioritizing national integrity, security, or economic growth and through incentives for individuals or organizations to help achieve strategic objectives (De Wit & Deca, 2020) but there is always a glitch between the overseas educational policy of every province as all provinces separately plan their separate policy for institutional growth and set regulations for educational units which are governed by external and internal actors through the implementation of control, coordination, and decision-making processes in the education sector which generates confusion and demand a pure national policy acceptable for all provinces (Andone, 2021). For this reason, it may be argued that in making Higher Education Policy, policymakers often overlook the national models for implementation by focusing on the American model of tertiary education which has a significant impact worldwide. Moreover, the former states like Germany France, and the UK tend to affect their colonies' education system by offering incentives and contemporary educational models (Tight, 2021) so, adopting global best practices (like STEM and American model of tertiary education) demand local version of the model that fulfill the needs of local issues through the use of available domestic resources.

IoHE in Pakistan:

Even though Pakistan's higher education industry faces obstacles due to the country's socio-economic instability, Pakistan still provides options for higher education and the nation's participation in globalization has opened up opportunities for both local and foreign students (Tayyaba Zia et al., 2023). The expanding urbanization in Pakistan has given to increasing post-secondary education in Pakistan where the National Gross Tertiary Enrolment Rate is estimated to be 12% in 2019 by the UNESCO Institute of Statistics (Janet B Ilieva et al., 2024). Similarly, there are 47164 Pakistani International students worldwide with more than 50000 in Western world and 5.6% enrolled in Higher Education Institutions in OECD countries (Alam et al., 2023).

Pakistan's growth in university education is driven and regulated by the Higher Education Commission (HEC) which focuses on enhancing, evaluating, and fostering the higher education atmosphere through policy implementation, budget control, and networking, which is primarily driven by realities of globalization (Mughul & Pekkola, 2009). HEC has been placed in multiple agreements with international organizations such as DAAD (Germany), and CSC (China). SFERE (France) and NUFFIC (Netherlands) to provide effective scholarship programs and promote joint research in local universities respectively (Zakaria et al., 2016). Likewise, HEC collaborates with 13 US, 6 UK, and 5



German institutions to face the challenges of the global economy in the higher educational market. (Alam et al., 2023).

STEM AS A CATALYST IN THE INTERNATIONALIZATION OF HIGHER EDUCATION IN PAKISTAN:

The internationalization of higher education in Pakistan is decisive for driving economic gains and prosperity in which STEM fields (Science, Technology, Engineering, and Mathematics) play a pivotal role. There is no doubt in the fact that, by incorporating STEM programs into the internationalization of education, Pakistan may attract leading human capital from all across the globe and through global research collaborations and partnerships which translates into better educational outcomes and better placement of their students in the competitive global market that believes in driving innovation in the country.

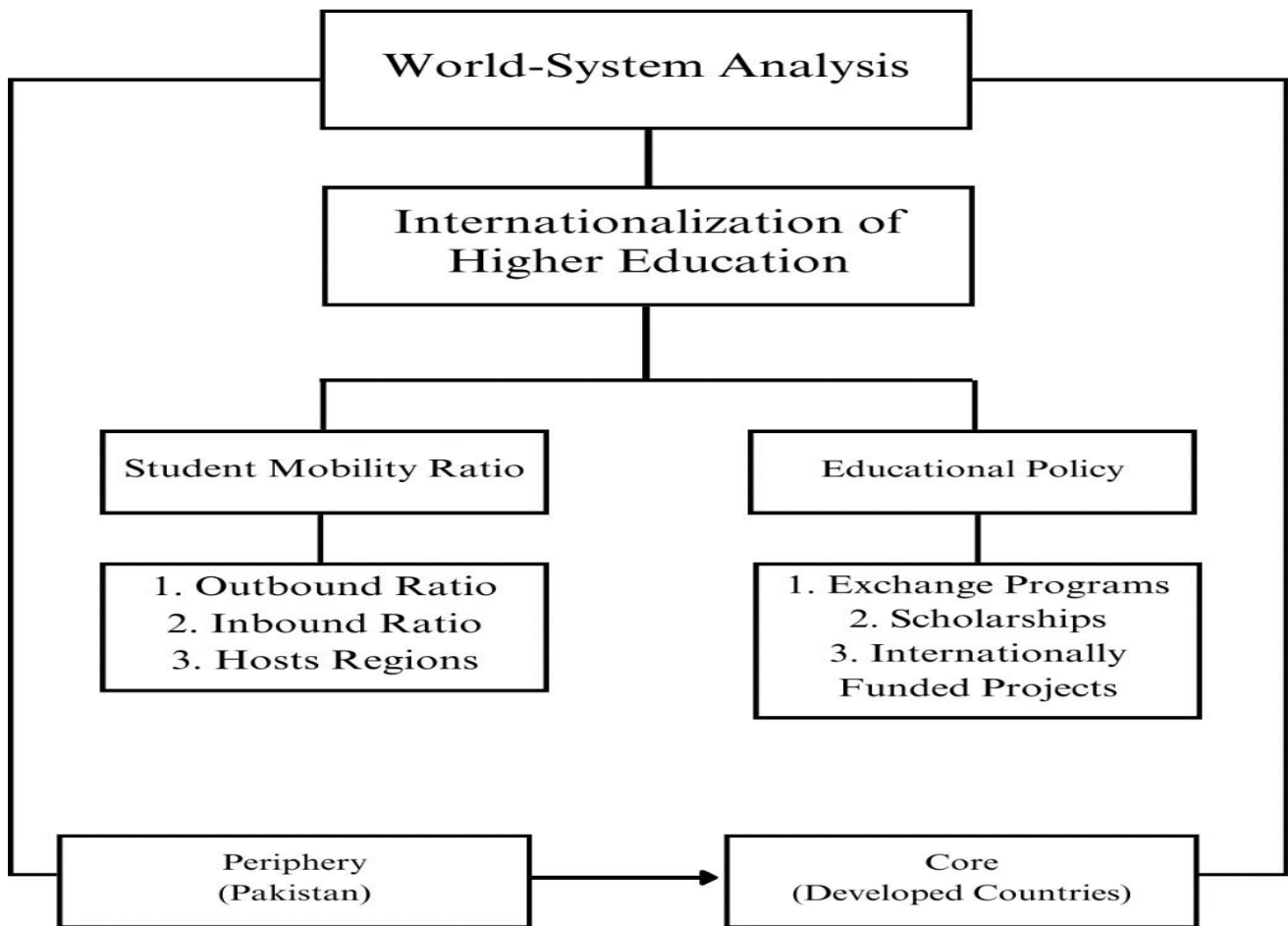
In addition, STEM will provide a backup for confronting international challenges like healthcare, global warming, climate change, and sustainability, and through the internationalization of STEM education in Pakistan our institutions can clout global expertise, technologies, and sustainable practices for confronting local and regional problems and will find ways to generate local solutions to the problems. STEM education may enable the Pakistani workforce and researchers to be part of global knowledge generation which enable Pakistan to find its space as a shining star in the global frame so, strong efforts are required by Pakistani institutions to become a knowledge creator and innovators to provide a push back to its declining economy.

THEORETICAL FRAMEWORK:

The World-System Analysis (WSA) is a macro-sociological approach given by Immanuel Wallerstein and is used by developmental practitioners and researchers to comprehensively study the contemporary education system under the emergent form of globalization research. WSA's viewpoint aims to explain the 'capitalist world economy' as a 'total social system' that emphasizes the uneven opportunities across the state due to the political and intellectual undertakings (Martínez-Vela, 2001) WSA focuses on the unbalanced linkages between the "core" developed and industrialized countries, such as USA, UK or Australia; and the "periphery" developing countries, such as Pakistan, Bangladesh or Nigeria, of the global economy. The political realists describe this relationship as a structural and dominant authority in core nations that obtain surplus labor from the periphery nations that results in negative implications for those territories' educational system and lead to the accumulation of interests and money in the core region (Arnové, 2009). According to the WSA framework, the development of knowledge and educational structures is one aspect of the evolution of the contemporary world system, during which time the foundations of the educational system have entered a phase of disarray and dispersion (Tom G. Griffiths & Lisa Knezevic, 2009).

World-System Analysis (WSA) is a suitable theoretical framework for this study as it takes into account the activities of educational institutions within a global framework and improves the comprehension of factors that may lead to conflict or change. It emphasizes how prestigious universities in the developed

'core' and international organizations such as the World Bank, the International Monetary Fund (IMF), the United States Agency for International Development (USAID), the Canadian International Development Agency (CIDA) or the Japanese International Cooperation Agency (JICA) endorse policies, partnerships and funding to benefit the dominant metropolitan centers in the core and does not profit aid recipients which leads to growing stratification across the nations to bring structural change in education system (Arnove, 2009). Using the provided literature review and the factors of WSA, the following framework has been developed to analyze the data and to draw the results of this qualitative study depicted in the framework of Figure 2 of WSA Framework (World System Analysis)





METHODOLOGY:

This qualitative study employed a secondary research approach, utilizing document analysis to scrutinize Higher Education Policies in Pakistan. This method offered a comprehensive overview of the data, capturing the policy developments and their impact over time. The study examined annual reports, policy documents, and scholarship agreements from the Higher Education Commission (HEC) of Pakistan. Additionally, data from the ICEF Monitor and UNESCO Institute for Statistics was analyzed to provide a comparative understanding of higher education internationalization in Pakistan. The World Systems Analysis framework was applied to categorize and analyze the data, while Descriptive Analysis was used to simplify and interpret the findings, identifying solutions and criteria to enhance the education system's administration and learning in the globalized era.

DISCUSSION AND RESULTS:

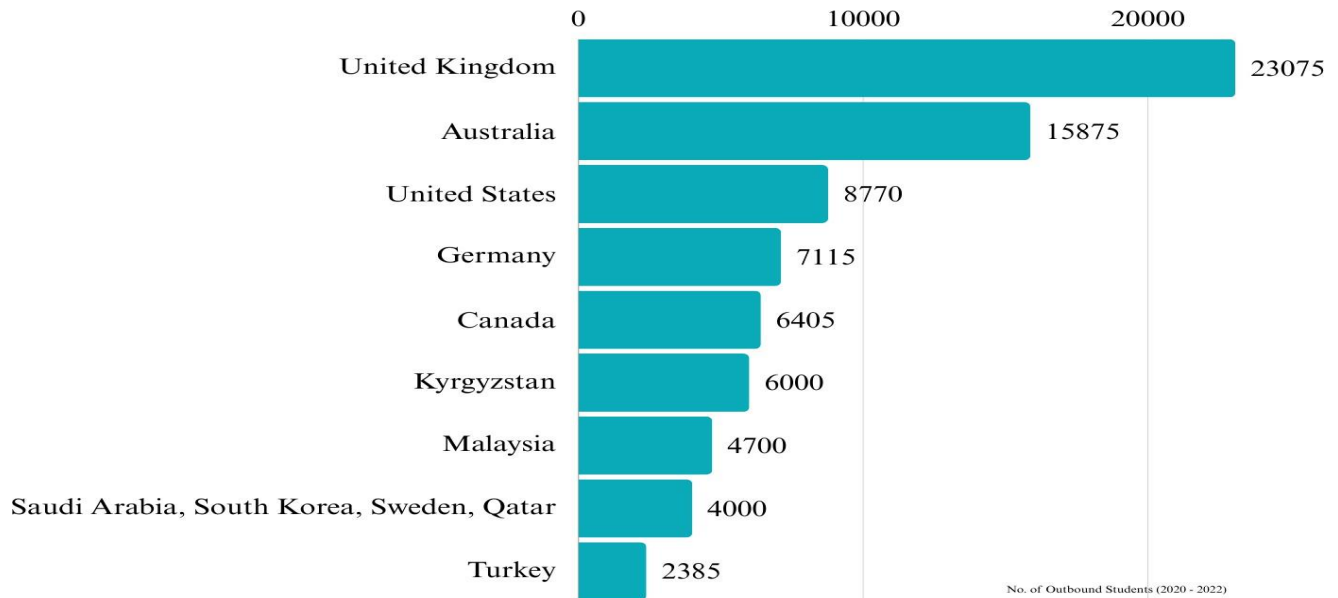
Pakistan has the third-largest population of individuals of university age (As per the Report of British Council), after China and India, however, the tertiary education in Pakistan is limited with an average participation rate lower than the global average (Janet B Ilieva et al., 2024). According to the Pakistan Economic Survey 2021 – 2023, there were 1.96 million students enrolled in universities and 820,000 students in degree-granting colleges during 2021 – 2022 (ITA (International Trade Association), 2024). During the age of globalization, Pakistan has adopted the IoHE policy quite liberally (Zakaria et al., 2016) which can be verified through the latest UNESCO Data of 2020, there are 64,065 Pakistani students enrolled in higher education programs overseas (ICEF Monitor, 2023). This Internationalization of Higher Education can be extensively understood through the WSA Theoretical Framework.

Student Mobility Ratio in Pakistan

The secondary data analysis has shown that, as the process of globalization enhances, Pakistan tends to be a major course of foreign students to other countries as shown by the UNESCO data that in the past 10 years, the outbound mobility has increased by 70% (Hunter & Services, 2020). Moreover, international mobility is expected to take a slower pace in the upcoming years, except in Pakistan where student mobility growth is predicted to grow until 2030 (Prest, 2024).

It is shown by (Janet B. Ilieva et al., 2024) that the majority of main drivers for Pakistani students to study abroad are quality of education, successful career assurance, and worldwide recognition. In addition, the (ICEF Monitor, 2023) Data, as represented in Figure 02, shows that the highest number of Pakistani students to study abroad, fly to the 'core' countries such as the UK, Australia, and the US as compared to flying abroad to 'periphery' or 'semi-periphery' countries like Turkey, Malaysia or Qatar. These results are supported by the World System Analysis that there remains an uneven exchange of surplus or individuals between the industrialized core and periphery countries which in the long run leads to capital accumulation during the globalization process (Martínez- Vela, 2001).

Figure 3 Outbound Mobility w.r.t to Host Country



This latest data can also be verified by the (ICEF Monitor, 2015) which predicted that the top tertiary education destinations for Pakistani students, by 2024, will be Australia (around 7400 students and the United Kingdom (5000 students), with Australia having 10.6% rise over the year-to-year growth. Similarly, (Alsharari, 2019) argued that the destinations of outgoing students are primarily developed countries, as a result of which America and Western Europe tend to maintain their supremacy in the globalization processes of the education system. On the other hand, there remains a lack of inbound mobility ratio data in the UIS Database as mentioned (Guillermé, 2021) which may be due to the unstable economy and inadequate higher education system in Pakistan, which makes it unpopular for overseas students. It is noted that the inbound mobility in Pakistan is driven by students from underdeveloped countries such as Somalia, Sudan, Yemen, or Afghanistan as they lack quality education back in their home country (Hunter & Services, 2020). These results are aligned with Wallerstein’s WSA illustrate how rich and poor states are inextricably linked in the global economy by promoting their benefits, and the drawbacks are extended into domains of politics and culture (ERWIN H. EPSTEIN, 2010) in the growing internationalization of education.

Educational Policy for IoHE in Pakistan:

For the development of Pakistan’s education system and educational policy, globalization is considered to be a phenomenon with both concerns and benefits (Mughul & Pekkola, 2009), and even though Pakistan’s Higher education has changed significantly over the years, it still faces challenges with policy implications, research productivity, global integration, and efficient



governance accompanied with the introduction of STEM education in our institutions (Tayyaba Zia et al., 2023). The results of this qualitative study have shown that, in Pakistan, there is a growing market of educational services where the local colleges are receiving foreign promotions which are exacerbated by ineffective governmental policies and reduced local funding in the higher education system (Ammar Husnain Khan, 2017).

It shall be noted that Pakistan has adopted IoHE policies in a way that the number of students studying abroad keeps on increasing over the years due to international financing, scholarship schemes (Zakaria et al., 2016), and funded projects as proved by the British Council 2024 Report (Janet B Ilieva et al., 2024) that 7% students studying abroad have university scholarships while 12% are receiving governmental scholarships that motivate them to study abroad. This is also reflected in the policies formulated by the Higher Education Commission (HEC) that promote funding and scholarships from the core countries like,

- Stipendium Hungaricum Scholarship Program 2024-25 (HEC, 2024b) in which Pakistani and AJ&K nationals are invited to apply for bachelor, master, and doctoral degrees through the HEC program in which Tempus Public Foundation would provide fees for students' tuition
- The Commonwealth Scholarship Commission (CSC) is a UK government scholarship program that has provided skills and knowledge to more than 30,000 Pakistani individuals. For the year 2023, CSC offered nominations for 26 masters and 30 doctoral programs (HEC, 2023).
- The Faculty Exchange Program is centered on international institutional agreements with organizations like YSEFP, DAAD, and the British Council to improve teaching and research collaboration by permitting faculties from Pakistan to travel to core advanced countries and vice versa (HEC, 2024a).
- The Higher Education Development Project (HEDP) is a \$400 million funded project of the World Bank that aims to develop faculty and staff; improve research and quality of higher education development of National Academy of Higher Education (NAHE) (Higher Education Commission, 2023).
- USAID has funded Pakistani tertiary educational institutions by offering financial aid assistance to low-income and marginalized students for their degree accessibility. USAID has provided over 19,500 scholarships, out of which 50% are given to women since 2014, and has also constructed cutting-edge applied labs and educational facilities centers. The University of Utah, the University of Alabama, and the International Institute of Education (U.S.) are the technical assistance partners under HESSA (2021–2026). USAID is assisting the HEC of Pakistan and sixteen public institutions in Pakistan (USAID.Gov, 2023).

The above policies are a clear reflection of World-System Analysis where the world order subliminally enforces the hierarchy of power between the rich 'core' and weak 'periphery' societies through the use of major technological support (Martínez-Vela, 2001). Similarly, the results are supported by the WSA workings that pose that the strong international philanthropic organizations tend to assist the peripheral countries (Arnové, 2009), like Pakistan, to essentially favor the dominant groups in the long run. These policies may be detrimental to the



development of developing countries, as Wallerstein mentioned that the nation-states work as elements in the WSA in which core nations use their class forces as tools to further their interests (Martínez-Vela, 2001).

CONCLUSION:

In a growing era of globalization, the Internationalization of Higher education has become one of the most important concerns where developing countries like Pakistan must work hard by taking steps to modernize their education system to thrive in the worldwide tertiary education business which requires STEM education. This IoHE has led to increased scholarship and mobility programs; faculty and student exchanges and student recruitment for international cooperation, educational development, and global enhancement. This has led to an increasingly competitive and commercialized approach so, a critical understanding of IoHE in Pakistan is mandatory by adopting a World-System Analysis Framework and STEM, which makes this study beneficial for the students and academicians to evaluate the analytical aspects of policy guidelines and mobility ratios impacting internationalization.

RECOMMENDATIONS:

It is a matter of fact that, academic institutions, educational policies, student mobility, and international funds are greatly affected by the rise of globalization as it creates a sustainable and high-caliber environment in the education sector so, universities and institutions are recommended to take immediate steps for the active promotion of their vision through the medium of personnel and administrative efforts. Similarly, linkages between local, regional, and global sectors should be a part of the internationalization of higher education in Pakistan. Additionally, the Pakistani policymakers and government should actively work on information and innovation interchange to attract international students which may lead to an increase in in-bound mobility and facilitation in international educational settings. Further, the policy actors must acknowledge and work on the significance of national identity, which is interlinked with development and globalization to understand the affiliations and their impact on the internationalization of higher education in Pakistan.

It is also recommended that authorities and stakeholders focus on the measurement of globalization and IoHE under the umbrella of STEM education which demands a multifaceted approach of chasing key performance indicators like international enrollment of students, faculty and student exchange programs, collaborative research, and competitive international curriculum, etc. Moreover, regular focused group analyses and surveys must be conducted to extract valuable insights about international practices that leave footprints on IoHE and STEM education where the utilization of data for setting benchmarks for global sustainable practices may also add value in improving the targets so, it is the responsibility of all stakeholder to develop strategies that enhance the standard of STEM education which may upgrade the global competitiveness of Pakistan and support our drowning economy.



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