

The Importance of Regionally Disaggregated Socio-Demographic Data in Assessing The Higher Education System

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ABSTRACT

Objective: The article aims to evaluate the significance of regionally disaggregated socio-demographic data in assessing the performance and effectiveness of the higher education system, focusing on key socio-demographic factors such as population size, age composition, territorial distribution, and educational participation rates. **Method:** The study employs a combination of information-analytical methods and data analysis techniques, including regional differences in socio-demographic aspects, to assess higher education systems. Descriptive and comparative statistics are used to describe regional disparities, and systems analysis is applied to evaluate the socio-demographic factors. **Results:** The findings reveal that regional socio-demographic disparities significantly influence higher education demand, educational access, and system functioning. The study shows that regions with high youth populations face a high demand for education, often exceeding institutional capacity, while economically disadvantaged regions encounter financial constraints, impacting enrollment despite high youth populations. **Novelty:** This research introduces socio-demographic data as a central tool in evaluating higher education systems, challenging traditional evaluation methods that ignore regional disparities. The study highlights the need for a region-sensitive approach to educational policy formulation and system evaluation.

INTRODUCTION

In contemporary society, the higher education system constitutes one of the key drivers of socio-economic development [1], [2]. Beyond its primary function of training highly qualified professionals, higher education plays a critical role in fostering innovation capacity, supporting regional development, and ensuring social stability [3]. As a result, the assessment of higher education systems has become an area of both scientific and practical relevance, with the main challenges revolving around the consistent criteria for quality testing and coverage for appropriate validation assessments.

Although higher education systems are commonly evaluated using aggregated quantitative statistics, institutional rankings and learning achievements. However, they often do not fully consider regional variations as well as demographic compositions and social settings [4], [5]. This limitation is indicative of the need for socio-demographic information to be included in evaluating higher education systems.

Regionally created sociodemographic measures are closely associated with higher educational demand, the availability of education infrastructure and the quality of education provision. Thus, one of purposes of the article is to give a theoretical and

empirical justification for significance of socio-demographic data while assessing higher education systems [6].

Literature Review

The evaluation of higher education systems has been extensively addressed in both international and national academic literature, with research methodologies evolving significantly over time [7], [8]. Early studies primarily focused on internal academic indicators, whereas more recent research increasingly emphasizes the importance of analyzing higher education within its social, territorial, and demographic context.

Classical approaches to evaluating education quality have traditionally relied on learning outcomes and research performance indicators. For example, analyses by Dill and Van Vught evaluated IHEs in terms of academic productivity, research performance and governance effectiveness. Business practices like these are useful to understand internal quality itself, but they tend to ignore region and demographic specificities [9].

Subsequent studies began to focus on the match between education systems and employment outcomes. Hanushek and Woessmann (64) quantified the economic viability of educational quality, together with making it clear that for labor market outcomes and productivity the skills matter. However, these reports did not adequately consider the demographic and regional differences.

The importance of the regional approach is evident especially in McCann and Florida's studies (10) who point out how human capital formation and 4 regional development are interrelated. Their investigation showed that location specific factors, such as the spatial distribution of higher education institutions and regional demographic population characteristics are fundamental to regional innovation capacity. However, socio-demographic variables are typically employed as background and not central analytical correlates.

Few existing studies incorporate social and demographic factors explicitly in HE evaluation. Joint analysis by the OECD and UNESCO draws particular attention to the effect of age structure, urbanization and migration on educational participation rates. For instance, the UNESCO's Education for All monitoring report reveals that population pressure drives demand for educational facilities and resources [11]. But these studies are more narrative in nature, and lack a comprehensive research approach for assessing HE systems.

Demographic transition theory-based studies offer an understanding on This article is downloaded from www.shs-conferences.org, published by EDP Sciences. These theories account for why younger populations stress education systems, and aging societies raise demand levels for lifelong learning and retraining. However, they do not suggest functional indicators for assessing higher education.

Mamadiyarov et al. talked about the ways that VR, AR, and even XR can be disruptive in the classroom. These immersive technologies have the potential to change the way that knowledge is presented, learnt and retained because they are capable of

offering experiences which are otherwise unavailable through conventional teaching methods [13]. Virtual field trips have been employed in elementary schools to stimulate interest, deepen understanding of abstract concepts, and create inclusive learning experiences at various grades and across subject areas. As promising as the instrumental aspects are, the chapter is also full of accounts of technical, financial, pedagogical and institutional challenges to enacting these at scale [14]. More recently, data-driven approaches have gained prominence in education research. Scholars such as Arrow and Heckman employ quantitative models to assess the economic and social returns of education. While methodologically robust, these approaches often lack sensitivity to regional socio-demographic heterogeneity [15].

In Central Asia and other post-Soviet contexts, higher education evaluation has primarily focused on institutional reforms, governance models, and regulatory frameworks, with demographic factors playing a secondary role. This limits the ability to fully assess regional inequalities in access and quality [16].

The study by Panjaitan et al. aimed to determine whether there was a difference in scientific literacy between students following the learning model and students following the STAD collaborative learning model, to determine the difference in scientific literacy due to students' achievement motivation, and to describe the interaction between learning model and achievement motivation on students' scientific literacy. This study used a post-test only control group design with two-factor analysis [17].

Overall, the literature indicates that although higher education evaluation research is methodologically diverse, the integrated analytical role of socio-demographic data remains underdeveloped. This article seeks to address this gap by positioning socio-demographic data as a central analytical tool in higher education system evaluation.

RESEARCH METHOD

The research uses a multimethodological design, encompassing: Descriptive and comparative statistics to describe regional differences on socio-demographic aspects; The analysis for relationships between population (and age), educational participation and other related factors as follows. Systems approach to the conceptualization of socio-demographic data as a system of factors for evaluation of higher education schools. Analytic synthesis to deduce conclusions and policy recommendations. This approach gives solid scientific grounds to assess HE systems in a regional sensitive way.

RESULTS AND DISCUSSION

This the analysis confirms that uneven regional distribution of socio-demographic indicators significantly influences the formation and functioning of higher education systems.

Table 1. Demographic Indicators and Demand for Higher Education by Region

Region Type	Share of Population Aged 18-24 (%)	Demand for HEIs	Existing HEI Capacity	Demand-Supply Imbalance
High demographic growth regions	19-22	Very high	Moderate	High
Medium demographic regions	14-18	Moderate	Moderate	Relatively balanced
Low demographic activity regions	10-13	Low	High	Low / Excess capacity

Source: Compiled by the author based on research findings.

The findings indicate that regions with a high proportion of youth experience strong and sustained demand for higher education, often exceeding institutional capacity. This results in increased competition, higher classroom loads, and potential risks to educational quality [18]. Conversely, regions with low demographic activity may possess sufficient infrastructure but face underutilization due to weak demand.

Socio-economic conditions further shape access to higher education. In economically disadvantaged regions, financial constraints limit actual enrollment despite a sizable youth population, leading to latent demand and exacerbating regional inequalities.

Table 2. Socio-Economic Conditions and Higher Education Participation

Region Type	Average Income Level	HE Participation (%)	Dropout Risk	Barriers to Access
Economically active regions	High	55-60	Low	Minimal
Moderately developed regions	Medium	40-50	Medium	Financial
Economically disadvantaged regions	Low	25-35	High	Financial + spatial

Source: Compiled by the author based on research findings.

The results show a strong correlation between income levels and higher education participation rates, reinforcing regional educational inequality. Graduate employment outcomes are also closely linked to regional economic conditions rather than education quality alone [19].

Table 3. Regional Conditions and Graduate Employment

Region Type	Graduate Employment (%)	Economic Activity	Realization of Education Outcomes
Major economic centers	70-80	High	High
Intermediate regions	55-65	Medium	Moderate

Region Type	Graduate Employment (%)	Economic Activity	Realization of Education Outcomes
Peripheral regions	40–50	Low	Low

Source: Compiled by the author based on research findings.

These findings suggest that graduate employment should not be used as a standalone indicator of higher education quality without considering regional socio-economic context.

Overall, the analysis demonstrates that socio-demographic data should be treated not as background information but as a core analytical component in evaluating higher education systems. Ignoring demographic dynamics may lead to misleading conclusions regarding educational quality and performance [20].

CONCLUSION

Fundamental Finding: Socio-demographic and socio-economic factors have differentiated effects on higher education systems across regions, emphasizing the importance of considering these factors in evaluations. The study finds that socio-demographic data are essential for objective evaluations and that regional demographic differences significantly influence demand for and access to higher education. **Implication:** Evaluation models that overlook socio-demographic factors fail to capture regional disparities, which can lead to misleading conclusions. The study suggests that evaluations must adopt a contextual and region-sensitive approach to improve the accuracy and relevance of higher education system assessments. **Limitation:** The study does not address the potential challenges in integrating socio-demographic data into existing evaluation models or the practical obstacles in continuous monitoring across diverse regions. **Future Research:** Future studies should focus on the integration of socio-demographic indicators into education policy design and system evaluation. Research should explore methodologies for continuous monitoring of socio-demographic data through information-analytical platforms to improve the responsiveness of higher education systems to regional needs.

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