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A NEW MATRIX FOR THE STRATEGIC ASSESSMENT OF THE GENERAL EDUCATION SYSTEM

The level of development of the general education system is an important factor in ensuring a country's competitiveness and security. A well-developed general education system enables a country to form high-quality human capital, reduce poverty levels, and foster a civil society at a qualitatively new level. Therefore, assessing the development of the general education system is crucial.

*This work aims to identify the primary factors influencing the current state of general education and to provide guidance for improvement through a strategic matrix. The horizontal axis of the two-dimensional matrix represents the sub-index of access to general education (*A*), and the vertical axis represents the sub-index of quality of general education (*Q*). The matrix distinguishes 4 quadrants, within one of which the country is positioned according to the assessments. These assessments are based on the Diagnostic Index of General Education Development.*

This matrix can serve as a valuable guide for education policymakers, experts, and researchers, providing insights into enhancing the overall education system in the face of global challenges. The results of the research will complement the existing discussions in the literature on the strategic management of general education.

Keywords: *general education, strategic management, beneficiaries of general education, general education development index, quality of education, accessibility of education*

JEL: C18, C44, I21

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INTRODUCTION. The sustainable development of general education systems requires diagnostic tools that accurately assess the current state of the system, with a specific focus on the quality and accessibility of education. Various tools exist to assess a country's general education system. However, they often conduct isolated measurements, focusing on one factor while neglecting others. These tools do not provide comprehensive insight into the system's development, which hinders managerial decision-making for governments and policymakers, as it remains unclear what strategic position the general education system occupies and which concrete steps are necessary to shift from a state of crisis to sustainable development.

Considering this gap in the literature, the proposed matrix enables countries to position their general education system in a two-dimensional strategic space, thereby defining priority areas for improvement. The matrix emphasizes the simultaneous diagnosis of the quality and accessibility of general education as equally influential factors.

LITERATURE REVIEW. Comparing the traditional and strategic approaches of general education institutions, we can note that traditional approaches focused mainly on solving operational problems, organizing current work and other procedures, while strategic management focuses on the formation of a vision for the general education system and the implementation of long-term goals, the development and implementation of policies aimed at improving educational outcomes, taking into account global trends and technological developments. Each state, by applying strategic management tools in the general education system will have the opportunity to form, develop and evaluate strategies that will correspond to the mission and vision of the given institution, and in general, general education institutions will be able to easily predict possible threats expected from the external environment, political changes, demographic shifts and in the long-term form a stable environment, rather than adapting to the requirements of the future (Dunbar M., 2016).

Thus, despite the fact that almost all theories in the literature consider the strategic management process at the micro level, it is nevertheless more comprehensive and applicable at the macro level, since here the goals are defined more comprehensively and are aimed at meeting public needs. General education, being the driving force of socioeconomic development, requires sectoral strategic management, which will enable setting priorities in the sector and stabilizing the system. Since education is the foundation of social equality and economic growth, the practical application of the above becomes increasingly relevant and urgent.

Strategic management often employs two-dimensional matrices to support informed decision-making. Mapping challenges in a 2x2 matrix simplifies complexity, clarifies the system's position, supports informed decisions, reduces errors, and highlights areas for improvement (Lowy & Hood, 2004).

To assess the current state of general education, it is essential to consider the multifaceted variables of education quality and accessibility. The selection of these factors in the study is determined by proven literature and conducted surveys.

There is ample evidence that teacher qualifications have a direct impact on student achievement. In a joint analysis of quantitative data from the 1993-94 National Assessment of Educational Progress (NAEP) and the Schools and Staffing Survey (SASS) in the USA, Darling Hammond found that teacher certification and preparation are among the most influential factors in student performance in reading and mathematics. The author concluded that U.S. states with a high proportion of qualified teachers and active participation in teacher training programs tend to have higher-than-average student achievement. Accordingly, improving teacher quality is seen as a key strategic direction for the development of general education systems (Darling-Hammond, 2000).

Studies conducted in public secondary schools in Kampala, Uganda, have also shown that teacher qualifications (educational level, work experience, certifications) have a positive impact on student achievement. Regression analyses revealed that students taught by more qualified and certified teachers scored higher on tests than those taught by less qualified teachers (Namulondo & Wabuna, 2025).

The issue of teacher qualifications remains pressing in Armenia. According to the World Bank's annual report, the Armenian general education system is threatened by an aging teacher workforce, with the average teacher age being 46.8 years. Approximately 20% of teachers are over 60, while only 11% are under 30 (World Bank Group, 2021, p. 32).

A comprehensive review of the literature on curricula reveals that high-quality textbooks and well-designed programs have a significant impact on improving student achievement. Some researchers also note that although students are satisfied and interested in the new methods and textbooks introduced into the curriculum, these do not necessarily guarantee quality education, which is due to limited facilities and infrastructure, as well as limited teachers' abilities (Esamada& Siti, 2024). In general, the curriculum is a crucial factor in education, significantly improving student outcomes when it is clearly aligned with national standards. This is particularly important in higher grades, where high-quality programs ensure academic progress (Steiner D., 2017, p. 1). In Armenia, the modernization of educational content is primarily focused on introducing new state standards.

In global practice, student learning outcome assessments are widely used to evaluate the quality of educational systems. For example, the OECD's PISA program measures the performance of 15-year-old students in mathematics, science, and reading, with results used to benchmark and assess the quality of education systems across both member and non-member countries. Armenia also participates in this international assessment.

Especially in crisis situations, the most important factor in ensuring the quality of education is access to technical equipment. History shows that in crisis situations, such as pandemics, wars, and unstable situations, many students are deprived of the opportunity to receive a quality education. Elena Ostanina, based on her research, has concluded that changes in technical infrastructure directly impact the psychological and emotional states of teachers and students (Ostanina, 2021).

To assess the overall development of the general education system, it is also necessary to consider factors that ensure educational access, such as regional access, digital access, socioeconomic access, and inclusiveness.

The problem of accessibility is most acute in low- and middle-income countries. For instance, in the RA, there is an annual shortage of teachers. This issue is particularly severe in high-mountainous and border rural communities. While the curriculum requires the teaching of certain subjects across different grades, the lack of qualified teachers in these subjects hinders students' ability to master them.

According to statistics, the education system faces a shortage of 600 to 700 teachers annually. Forecasts indicate that this number is likely to increase, as nearly half of the current teachers are approaching retirement age, and the number of newly trained teachers is significantly small (Teach for Armenia).

RESEARCH METHODOLOGY. To determine which quadrant of the two-dimensional strategic matrix a given country falls into, it is necessary to obtain the general education development diagnostic index, the formula for which is presented in the discussion section. To present the quadrant in which the Republic of Armenia falls, we conducted a focus group survey among specialists in the general education sector of RA, covering a wide range of stakeholders and forming focus groups. The number of respondents was 217, which ensured representativeness based on a 95% confidence level, a 4% permissible error, and compliance with the requirement of covering at least 10% of the population under study. Such a sample size provided the necessary level of representativeness, allowing for the generalization of results to the entire population.

The focus groups were formed from the school and extracurricular environment, including graduates, community members, and representatives of state departmental bodies. Each group presented its assessment of general education quality and accessibility on a 10-point scale (1 = minimum, 10 = maximum), as shown in Table 1. This approach ensured the inclusion of all key stakeholder categories in the survey process.

The further steps of calculating the index and the methodology for constructing it in the matrix are presented in the discussion section.

DISCUSSION. For situational interpretations of the level of general education, a two-dimensional matrix is used to assess the development of the general education system (see Figure 1), allowing countries to position their general education system in a two-dimensional strategic space and define priority areas for improvement. The matrix enables the simultaneous assessment of both the quality and accessibility of general education as equally important factors.

The horizontal axis of the two-dimensional matrix proposed by us represents the sub-score for access to general education (A), and the vertical axis represents the sub-score for the quality of general education (Q). The matrix distinguishes 4 quadrants, which are:

- 1. **Low quality, low accessibility – a crisis system**, radical systemic changes are needed,
- 2. **High quality, low accessibility – an elite system**, equality and inclusion strategies are needed,
- 3. **Low quality, high accessibility – a vulnerable system**, quality-oriented changes are needed,
- 4. **High quality, high accessibility – a sustainably developed system**, efforts should focus on maintaining stability and continuous improvement.

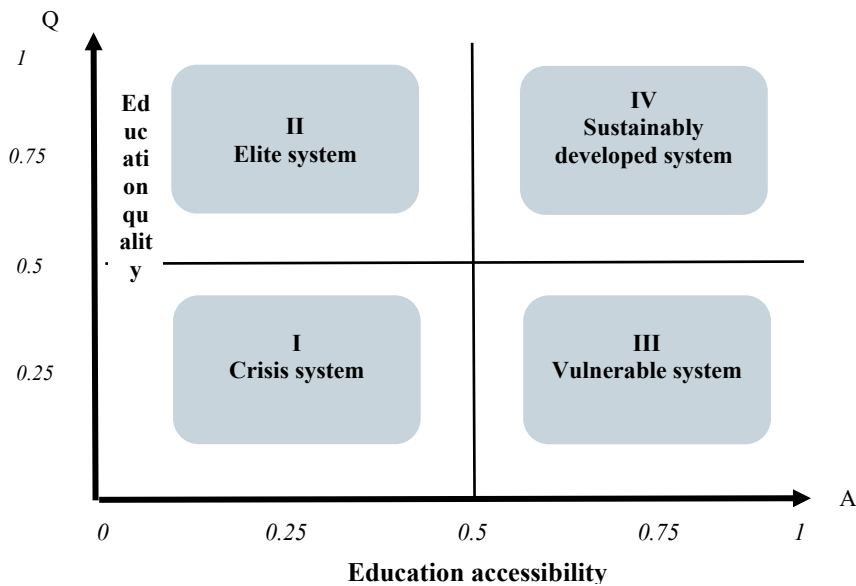


Figure 1. *Proposed Two-Dimensional Matrix for Assessing the Development of the General Education System*

In essence, the proposed two-dimensional matrix enables a situational diagnosis of the state of general education development. This analytical framework highlights the necessity of transitioning from unfavorable to favorable quadrants (i.e., from Quadrant I to Quadrant II, from Quadrant II to Quadrant III, and finally, Quadrant IV), making appropriate strategic management decisions.

To assess the current state of general education system within the matrix, we introduce the General Education Development Diagnostic Index, defined by the following formula:

$$I_{GE} = \sqrt{I_Q \times I_A} \quad (1)$$

where I_Q denotes the quality sub-index and I_A the accessibility sub-index.

We propose to construct the index using the sub-indexes, taking into account the functional interaction of the following components:

$$I_{GE} = \sqrt[8]{I_{Q1} \times I_{Q2} \times I_{Q3} \times I_{Q4} \times I_{A1} \times I_{A2} \times I_{A3} \times I_{A4}} \quad (2)$$

where I_{Q1} – teacher quality, I_{Q2} – curricula, I_{Q3} – students' learning achievements, I_{Q4} – technical equipment of the educational environment, I_{A1} – regional accessibility, I_{A2} – socio-economic accessibility, I_{A3} – digital accessibility,

I_{A4} – inclusiveness.

The use of these sub-indexes of education quality and education accessibility is explained in the literature review. The following factors were taken as the most important and influential in the general education sector (see Figure 2).

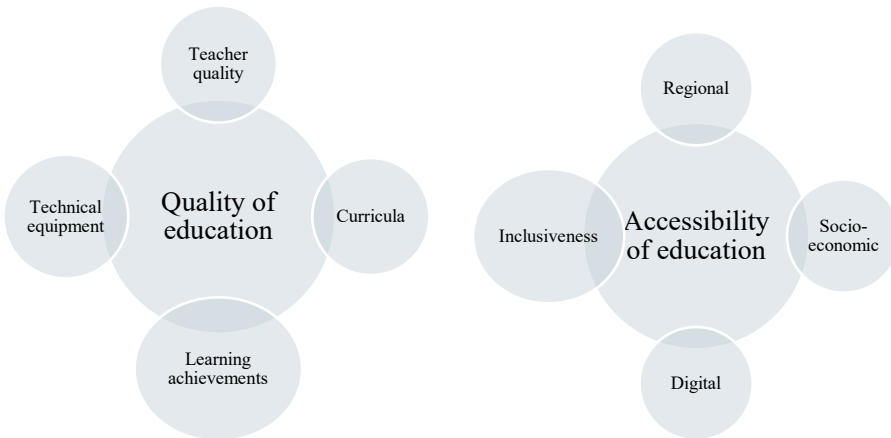


Figure 2. *Components of quality of education and accessibility of education*

The proposed matrix is based on two key factors influencing the general education system: the quality of education (I_Q) and the accessibility of education (I_A). The simultaneous provision of these two factors is essential for achieving the 4th UN Sustainable Development Goal (UNESCO).

The magnitude of the index determines the quadrant of the proposed two-dimensional matrix in which a country's general education system will be positioned. Furthermore, the index ranges from 0 to 1,0 and its calculation involves the following steps.

Step 1. The factors for calculating the sub-indexes are selected in terms of both educational quality and accessibility. In our case, they are distributed across four dimensions each, although additional factors may be incorporated

depending on the dynamic changes affecting the development of general education.

Step 2. Surveys are conducted to measure each sub-index using a 10-point scale (where 1 represents the minimum and 10 the maximum). Then the survey results are averaged and presented as decimal values for each sub-index.

Step 3. The values of the sub-indexes are aggregated into the general education development diagnostic index. The harmonic mean is applied to assess the overall levels of educational quality and educational accessibility.

Step 4. The aggregated results of the I_Q and I_A sub-indexes are combined to derive the I_{GE} , which subsequently determines the position of the general education system within the proposed two-dimensional assessment matrix.

Table 1

Results of focus group survey		
Sub-index	Meaning	Average score
I _{Q1}	Teacher quality	7
I _{Q2}	Curricula	4
I _{Q3}	Students' learning achievements	5
I _{Q4}	Technical equipment	2
I _{A1}	Regional accessibility	7
I _{A2}	Socioeconomic accessibility	7
I _{A3}	Digital accessibility	2
I _{A4}	Inclusiveness	1

The results of standard deviation analysis demonstrate that graduates are more inclined to highlight solutions to the challenges of quality and accessibility in general education, with their ratings being relatively close to the calculated mean scores. At the same time, we consider it necessary to note that the standard deviations received of responses provided by state agencies and community groups also do not deviate significantly from the average (see Table 2).

For each focus group, the standard deviation was calculated to measure the dispersion of assessments from the mean (see Table 2).

Table 2

Standard deviations of the ratings of the surveyed focus groups			
Focus groups	Mean (μ)	Standard deviation (σ)	Coefficient of variation (σ/μ)
Graduates	5.35	2.07	0.38
Community population	4.10	2.21	0.53
State agencies	4.58	2.14	0.47

Thus, the surveys demonstrate that different stakeholder groups associated with general education in Armenia show consistent patterns in their evaluations of both the quality and accessibility of education.

After processing the survey data, the composite index (I_{GE}) is calculated using the harmonic mean of the sub-indexes.

$$I_{GE} = \sqrt[8]{0.7 \times 0.4 \times 0.5 \times 0.2 \times 0.7 \times 0.7 \times 0.2 \times 0.1} \approx 0.36$$

According to the situational diagnosis, the result indicates that the level of development of general education is critical, since at $I_{GE}=0.36$ the system is positioned in the first quadrant of the two-dimensional matrix (since the average score for IA is 4.25 and for IQ is 4.5, both falling below the critical threshold of 5). The primary reasons for this unfavorable position are the very low scores for inclusiveness and digital accessibility, as well as the limited technical equipment of the educational environment. Therefore, to position itself in the most favorable quadrant, strategic management should make decisions in the near future to improve the aforementioned factors.

Finally, our survey results showed that, according to public perception, quality and accessibility are the most important elements in general education. This confirms the empirical fairness of choosing these matrix elements.

CONCLUSIONS. The introduction of two-dimensional matrices is crucial in strategic management, enabling us to select a strategy to address the challenges facing the system. The proposed matrix is unique in its kind, enabling a situational assessment of the development of general education. The matrix addresses several strategic management challenges.

First, the matrix analyzes how quality and accessibility together affect the general education system.

Second, it identifies critical weaknesses and gives a basis for making strategic decisions soon.

Third, the General Education Development Diagnostic Index (IGE) ensures broad coverage in the evaluation process, as it is constructed on the measurement of multi-layered factors that reflect both the quality and accessibility of general education.

Fourth, after obtaining the diagnostic index of general education development and positioning the country in the matrix, it is possible to understand the current state of general education development in the country and take the necessary steps in terms of improvement directions. If the country is in the first quadrant, then we have a problem with low quality and limited access to education; accordingly, it is necessary to choose specific strategies (taking into account which sub-indexes have a lower value) for transitioning to a sustainably developed system, the fourth quadrant. If the country is located in the second quadrant, it is necessary to choose strategies that promote educational access. Similarly, it is necessary to choose strategies that promote educational quality if the country is in the third quadrant. In the case of being in the fourth quadrant, it is necessary to choose strategies to maintain and develop the current position.

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