Analysis of the Direct Influences of Quality Vectors of the Educational Process and Learning Environment on Educational Quality and Performance

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Abstract

This study examines the direct influence of educational process quality vectors and learning environment factors on institutional performance and perceived educational quality. Grounded in Total Quality Management (TQM) principles and educational leadership theories, the research employs structural equation modeling (SEM) to analyze survey data from 430 educators in Southwest Oltenia, Romania. The results demonstrate that key vectors—including teacher professional development, constructive feedback systems, adequate infrastructure, and student engagement initiatives—account for 56% of the variance in measurable outcomes and quality perceptions. Path coefficients reveal equally strong effects on objective performance and subjective evaluations, suggesting that investments in process quality yield dual returns: enhanced academic achievement and strengthened institutional trust. The findings validate an integrated quality management approach, where pedagogical and organizational factors operate synergistically to drive improvement. Practical implications highlight the importance of resource allocation, participatory leadership, and systematic quality assurance in achieving sustainable educational excellence.

Key words: educational quality, learning environment, performance, quality management, teacher development
J.E.L. classification: I21, I28, M10

1. Introduction

Pursuing educational quality is a cornerstone of modern societies, shaping individual opportunities and collective progress. In recent decades, the global education landscape has witnessed profound transformations, with policymakers and scholars increasingly recognizing that true excellence emerges not from isolated interventions but from the complex interplay between teaching processes, learning environments, and institutional management. This study emerges at a critical juncture where educational systems worldwide grapple with translating resources into meaningful outcomes while maintaining stakeholder confidence.

Contemporary educational research has illuminated various quality dimensions, yet significant gaps persist in understanding how specific process vectors directly influence measurable performance and perceived educational value. The present investigation draws upon integrated quality management frameworks and modern educational leadership theories to examine these relationships systematically (Vărzaru and Vărzaru, 2013a, 2013b). Rather than viewing educational quality as a monolithic concept, we approach it as a dynamic ecosystem where teacher development, student engagement mechanisms, infrastructure adequacy, and quality assurance policies interact to produce tangible results (Rotea et al., 2023; Georgescu et al., 2024).

Our research is particularly timely given the evolving expectations placed on educational institutions. Traditional models emphasize pedagogical techniques or administrative efficiency, but current paradigms demand holistic approaches bridging these domains. The Romanian educational context, with its unique post-communist transformation challenges and ongoing reform efforts, provides a compelling setting for this inquiry (Bocean, 2007a, 2007b, 2009, 2011). By focusing on the southwest Oltenia region, we capture insights from an area representative of urban and rural educational realities, offering nuanced perspectives on quality implementation.

This study focuses on objective performance metrics and subjective quality perceptions. Previous research has often treated these as separate domains, whereas our analytical model reveals their interconnected nature. The findings challenge the conventional wisdom that resource allocation alone determines educational success, demonstrating instead how strategic process management amplifies the impact of available resources.

At its core, this investigation speaks to educators, administrators, and policymakers seeking evidence-based strategies for quality improvement. The insights generated are relevant for systems undergoing reform, providing a framework for balancing standardization with adaptability and institutional requirements with individual learning needs. As education systems worldwide confront new challenges, from digital transformation to evolving labor market demands, understanding these fundamental quality vectors becomes not merely academic but imperative for sustainable development.

The structure of the article follows a clear logic. The second section outlines the theoretical foundations, the third presents the methodology, the fourth analyzes the results and their implications, and the fifth provides the conclusion. Through this investigation, the study aims to offer an empirical basis for educational policies that promote excellence through integrated quality management.

2. Theoretical background

Effective collaboration between teaching staff and school management lies at the heart of institutional success in education. Contemporary educational leadership theories (Fullan, 2007, 2014, 2020) and Total Quality Management principles (Deming, 2000) emphasize how transparent communication between educators and administrators enhances the implementation of teaching strategies and learning outcomes. The distributed leadership model (Spillane et al., 2001) further highlights the transformative power of inclusive decision-making—when teachers actively shape policies, educational strategies become more responsive to student needs while streamlining institutional processes. Harris and Spillane (2008) demonstrate that this participatory approach fosters a more profound commitment to policy implementation and elevates perceived educational quality.

Student engagement emerges as equally vital in assessing educational excellence. Dewey's (1938) foundational work frames education as an interactive process where learners transform from passive recipients to active architects of their knowledge. This paradigm shift proves essential for developing critical thinking, problem-solving, and self-regulated learning competencies (Nicol & Macfarlane-Dick, 2006). Empirical studies (Fredricks et al., 2004) confirm that interactive, collaborative learning environments correlate strongly with heightened motivation, academic achievement, and positive evaluations of educational settings—effects extend beyond classrooms into extracurricular activities shaping personal and social development.

Systematic quality assurance forms the third pillar of educational excellence. Juran (1988) and Deming (2000) establish how standardized quality procedures reduce variability and enhance efficiency within TQM frameworks. Newton's (2010) research underscores that consistent policy application creates organizational stability, enabling measurable improvement. Without such coherence, disparities in educational quality inevitably emerge, eroding stakeholder confidence (Vărzaru & Vărzaru, 2015a, 2015b).

3. Research methodology

The research design involves a quantitative investigation based on a questionnaire applied to 430 teachers from the southwest Oltenia region. The collected data are processed using structural equation modeling, similar to other research (Vărzaru and Vărzaru, 2016; Nicolescu and Vărzaru, 2020; Vărzaru, 2024). The hypothesis investigated starting from the research objective is the following: Hypothesis H1. The vectors of the quality of the educational process and the learning environment directly influence educational performance and the results of implementing the integrated approach to quality management within the school. The observable variables of the research are shown in table no. 1.

Table no. 1 Research variables

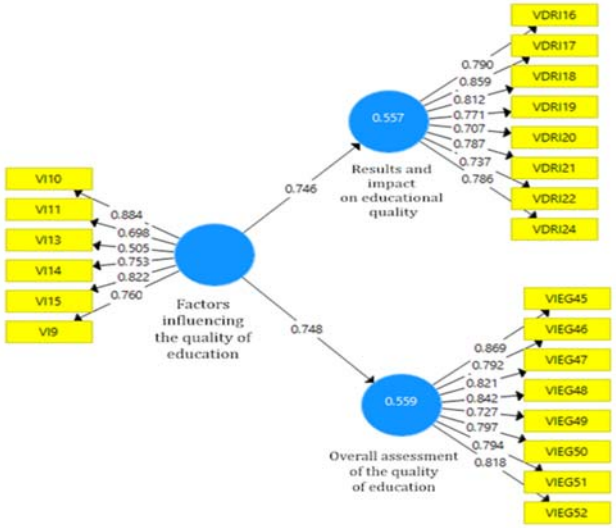
Code	Variable	Code	Variable
VI9	Continuous teacher professional development	VDRI21	Active engagement and motivation
VI10	Constructive student feedback	VDRI22	Flexible educational programs
VI11	Accurate competency evaluations	VDRI24	Parent and community feedback
VI13	Adequate educational infrastructure	VIEG45	Education quality satisfaction
VI14	Quality assurance policies	VIEG46	Proper teacher preparation
VI15	Extracurricular opportunities	VIEG47	Well-structured educational program
VDRI16	Academic and social skills development	VIEG48	Student success opportunities
VDRI17	Higher education readiness competencies	VIEG49	Professional development opportunities
VDRI18	Strong national assessment results	VIEG50	Impact of extracurricular activities
VDRI19	Resource-outcome correlation	VIEG51	Appropriate teaching resources
VDRI20	Student and parent satisfaction	VIEG52	School recommendation

Source: Developed by the authors based on literature review

4. Results and discussions

To test hypothesis H1, we also used structural equation modeling. Figure no . 1 illustrates the model regarding the direct influences of the vectors of the quality of the educational process and the learning environment on the variables characterizing the educational performance and the results of the implementation of the integrated approach to quality management within the school, applied to the selected sample, obtained using SmartPLS v 3.0.

Figure no. 1. PLS model regarding direct relationships between the vectors of educational process quality, educational performance and the results of implementing the integrated approach to quality management



Source: Developed by the authors based on data using SmartPLS v3.0

The R-squared values of 0.559 for the overall quality assessment and 0.557 for educational outcomes indicate a solid explanatory capacity, suggesting that approximately 56% of the variance in both constructs can be attributed to the quality factors included in the model. This significant proportion confirms the practical relevance of the independent variables in explaining the educational phenomena studied.

Regarding the reliability of the constructs, the values of Cronbach's Alpha, rho_A, Composite Reliability and Average Variances Extracted (AVE) are within acceptable limits, indicating good internal consistency and satisfactory convergent validity (Table no . 2).

Table no. 2 Model reliability indicators regarding direct relationships between the vectors of educational process quality, educational performance and the results of implementing the integrated approach to quality management

	Cronbach's Alpha	**rho_A**	**Composite Reliability**	**Average Variances Extracted (AVE)**
Overall assessment of the quality of education	0.924	0.929	0.938	0.653
Factors influencing the quality of education	0.837	0.864	0.880	0.557
Results and impact on educational quality	0.909	0.913	0.926	0.612

Source: Developed by the authors based on data using SmartPLS v3.0

Reliability indicators (Cronbach's Alpha between 0.837-0.924) and validity (AVE > 0.55) confirm the robustness of the constructs.

The VIF values, all below 4, rule out serious concerns about multicollinearity. These technical characteristics strengthen confidence in the validity of the conclusions that can be drawn from the model (Table no . 3).

Table no. 3 Collinearity of variables in the model regarding direct relationships between the vectors of educational process quality, educational performance and the results of implementing the integrated approach to quality management

Variable	**VIF**	**Variable**	**VIF**
VDRI16	2,231	VI14	2,189
VDRI17	3,791	VI15	2,188
VDRI18	3,015	VI9	1,877
VDRI19	2,020	VIEG45	3,501
VDRI20	2,402	VIEG46	2,909
VDRI21	2,705	VIEG47	2,989
VDRI22	1,980	VIEG48	3,069
VDRI24	2,180	VIEG49	1,873
VI10	3,337	VIEG50	2,630
VI11	1,896	VIEG51	2,327
VI13	1,585	VIEG52	2,632

Source: Developed by the authors based on data using SmartPLS v3.0

The path coefficients, both approximately 0.75, reflect strong and statistically significant relationships ($t > 34$, $p < 0.001$), demonstrating that improvements to educational processes directly impact both perceptions of quality and concrete outcomes (Table no . 4).

Table no. 4 Path coefficients within the model regarding direct relationships between the vectors of educational process quality, educational performance and the results of implementing the integrated approach to quality management

	Original sample	Samp Mean	Standard deviation	T statistics	P -values
Factors influencing the quality of education → Overall assessment of the quality of education	0.748	0.751	0.017	44,166	0.000
Factors influencing the quality of education → Results and impact on educational quality	0.746	0.748	0.021	34,814	0.000

Source: Developed by the authors based on data using SmartPLS v3.0

Interestingly, the two relationships have almost identical intensities, suggesting a remarkable balance between the impact on educational performance's subjective and objective dimensions.

The analysis highlights how well-designed educational policies, adequate resources and effective pedagogical practices create fertile ground for improving measurable outcomes and strengthening trust in the education system. The relationships identified suggest that investments in the quality of the educational process have a double return: on the one hand, students achieve higher academic results, and on the other hand, the entire educational community develops a more positive perception of the value of school.

These results provide robust empirical confirmation of hypothesis H3, demonstrating that excellence in education is built through systematic interventions on fundamental processes. The model supports the perspective that an integrated approach to quality management, which pays attention to pedagogical and organizational factors, can generate simultaneous improvements in objective and subjective terms.

5. Conclusions

The findings of this study paint a compelling picture of education as an ecosystem where quality emerges from the subtle interplay between tangible processes and intangible human factors. It becomes clear that educational excellence cannot be manufactured through policy mandates alone, nor can it spring spontaneously from individual dedication—it lives in that delicate space where structure meets agency, where institutional frameworks enable rather than constrain pedagogical innovation.

The data reveals something profound and reassuring: when teachers are given opportunities for meaningful professional growth, when classrooms become spaces for authentic dialogue rather than mere transmission of knowledge, and when schools approach quality as a shared journey rather than a compliance exercise, something remarkable happens. Performance metrics improve, but the perception of what education can achieve begins to shift. Students start seeing themselves as active participants in their learning, teachers rediscover their vocation beyond administrative burdens, and communities begin to view schools as institutions and catalysts for transformation.

Perhaps the most significant insight lies in the model's equal weight to measurable outcomes and perceived quality. The implications for policymakers and school leaders are both challenging and liberating. They are challenging because they require moving beyond quick fixes to address the complex web of factors that shape educational experiences. With its unique history and current reform efforts, the Romanian context demonstrates how even systems facing significant constraints can cultivate excellence by focusing on the right leverage points.

As we look to the future of education in an increasingly complex world, this study offers findings and a philosophy. It suggests that the path to educational quality is not about choosing between rigor and relevance, tradition and innovation, or individual achievement and collective good. The most promising solutions emerge when we stop seeing these as dichotomies and start recognizing them as dynamic tensions that, when skillfully managed, can propel education forward.

Ultimately, what these conclusions affirm is something great educators have always known: that quality education is as much about relationships and perceptions as it is about curricula and assessments. By attending to both dimensions with equal care, we honor the full complexity of teaching and learning, not as mechanical processes to be optimized but as profoundly human endeavors to be nurtured.

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