TRANSFORMING INTERNAL AUDIT AND MANAGERIAL CONTROL IN PUBLIC EDUCATION THROUGH GENERATIVE AI: CHALLENGES AND PERSPECTIVES

Ph.D. Anișoara-Elena PAVELESCU (BELBE)
"Valahia" University of Târgoviște, Romania
E-mail: anisoara.pavelescu@yahoo.com

Abstract: *The increasing complexity of financial operations and the demand for higher transparency and accountability in the public sector have emphasized the need for innovative tools in internal audit and managerial control systems. This paper explores the integration of Generative Artificial Intelligence (GAI) technologies in optimizing the internal control systems and internal audit processes within Romanian public educational institutions. The main objective of the research is to assess how GAI can enhance the efficiency, accuracy, and responsiveness of internal audit practices while supporting the modernization of the Internal Managerial Control System (IMCS). The study is based on an empirical approach, combining qualitative and quantitative methods, including structured questionnaires, semi-structured interviews with auditors and IT experts, and case studies conducted in both pre-university and higher education institutions. The results show that GAI can significantly improve the automation of risk assessments, real-time monitoring, data-driven decision-making, and predictive audit reporting. Moreover, it facilitates continuous auditing, enhances the reliability of financial records, and reduces human error, thus contributing to a more transparent and effective resource management system in education. Despite the benefits, the study also addresses key challenges such as data quality, integration costs, ethical concerns, and the need for tailored training for audit professionals. The research contributes to the literature by proposing actionable strategies for implementing GAI in the public education sector, highlighting both its transformative potential and the conditions necessary for successful adoption. This paper is relevant to scholars, policymakers, and practitioners interested in the intersection of accounting, internal control, audit innovation, and public sector digitalization. It calls for a paradigm shift in the way internal audit and control are approached in educational institutions, emphasizing the critical role of GAI in building resilient and future-ready audit systems.*

Keywords: *Generative Artificial Intelligence, Internal Audit, Managerial Control, Public Education, Digital Transformation, Risk Management, Continuous Auditing.*

JEL Classification: *M42, I22, H83, O33.*

1. Introduction

In recent years, public education institutions have been facing increasing pressure to ensure transparency, accountability, and performance in the use of public resources. Internal audit and managerial control systems play a critical role in achieving these objectives, particularly in a complex and highly regulated environment such as Romania's public education sector. However, traditional audit tools often struggle to keep up with the volume and complexity of operations, exposing institutions to delays, inconsistencies, and risk oversight.

In this context, Generative Artificial Intelligence (GAI) technologies are emerging as transformative tools with the potential to enhance both internal audit functions and the Internal Managerial Control System (IMCS). Their capacity to automate data analysis, generate predictive insights, and support continuous auditing opens new opportunities for improving decision-making processes and reducing human error.

This paper explores the potential of GAI to transform internal audit and managerial control within Romanian public education. Building on previous doctoral research, the study investigates both the benefits and challenges associated with GAI integration, using a mixed-method approach that includes case studies, interviews, and survey data. The objective is to

identify concrete ways in which these technologies can support audit modernization while ensuring compliance with national standards and ethical frameworks.

2. Theoretical Framework

2.1 Internal Audit and Managerial Control in Public Education

Internal audit and internal managerial control systems (IMCS) are essential mechanisms for ensuring compliance, risk management, and efficient resource allocation in public sector institutions. In Romania, the implementation of IMCS in educational institutions is regulated by national legislation, particularly the Order of the Ministry of Public Finance no. 600/2018, which defines the principles and standards of internal control within public entities.

In the education sector, internal audit serves not only as a verification tool but also as a mechanism for organizational learning and performance improvement. However, several studies, including the author's doctoral research, have revealed that the audit function in Romanian public education is often constrained by limited digital infrastructure, insufficient automation, and reliance on manual processes.

2.2 Digitalization and Innovation in Public Sector Auditing

The digital transformation of public sector auditing is an increasingly important topic in economic research and practice. Recent developments in data analytics, robotic process automation (RPA), and machine learning have begun to reshape audit procedures across sectors. These technologies allow for greater coverage, speed, and analytical depth, enabling auditors to detect anomalies and trends that would otherwise remain hidden.

Nevertheless, in the public education context, digital adoption remains uneven. While some institutions have initiated digital audit processes, the overall ecosystem lacks the necessary integration and skilled human capital to fully benefit from digital innovations.

2.3 Generative Artificial Intelligence in Audit and Control

Generative AI (GAI), a subset of artificial intelligence that creates new content and patterns from data, represents a paradigm shift in audit innovation. Unlike traditional automation tools, GAI systems can produce audit reports, simulate scenarios, and support strategic decisions based on large volumes of structured and unstructured data.

In internal audit, GAI can enhance risk assessment, automate routine tasks, and facilitate real-time monitoring. Moreover, in the context of managerial control, GAI tools can generate predictive insights and simulate control scenarios, helping managers better allocate resources and respond to potential failures.

Despite these promising developments, GAI integration in public education raises critical challenges related to data quality, ethical use, transparency, and the readiness of the institutional and legal framework. These aspects are further explored in the empirical section of this study.

3. Methodology

This research adopts a mixed-method approach to investigate the potential impact of Generative Artificial Intelligence (GAI) on internal audit and managerial control systems in Romanian public education. The choice of methodology is aligned with the need to capture both the quantitative extent of current practices and the qualitative insights of key stakeholders.

3.1 Research Design

The study is exploratory in nature, aiming to identify trends, opportunities, and challenges associated with GAI integration. The research framework is grounded in previous doctoral work conducted by the author, which examined the structure and efficiency of the Internal Managerial Control System (IMCS) across pre-university and higher education institutions.

3.2 Data Collection

Primary data were collected using three complementary tools:

- **Structured questionnaires** distributed to internal auditors, financial officers, and school managers in 42 public education institutions (27 pre-university and 15 higher education). The questionnaire focused on the current use of digital tools in auditing and perceptions of GAI.
- **Semi-structured interviews** conducted with 12 professionals, including internal auditors, IT specialists, and representatives from audit authorities, to explore deeper insights into feasibility, risks, and readiness for AI adoption.
- **Two case studies**, one in a university and one in a public high school, were developed to illustrate the practical context of internal audit operations and to simulate GAI use scenarios.

3.3 Data Analysis

Quantitative data were analyzed using descriptive statistics to identify patterns in technology usage, efficiency perceptions, and audit outcomes. Qualitative data from interviews were coded thematically, focusing on perceived barriers, institutional culture, and ethical concerns.

3.4 Research Limitations

The main limitations of this study include the relatively small sample size, which may limit generalizability, and the novelty of GAI, which means that most institutions have not yet implemented such technologies. However, the empirical findings offer valuable insights into the preparedness and expectations of stakeholders regarding future transformations in audit and control systems.

4. Findings and Discussion

4.1 Current Practices in Internal Audit in Public Education

The data collected from the 42 surveyed institutions reveal that internal audit processes are still largely manual. Over 85% of respondents indicated limited use of digital tools, with most relying on spreadsheets and document-based reporting. Although some higher education institutions have begun to adopt basic forms of automation, there is no evidence of advanced technologies—such as GAI—being used operationally.

Auditors reported challenges such as data fragmentation, lack of real-time access to financial information, and dependence on outdated legacy systems. These limitations reduce the effectiveness of risk-based audit planning and delay the detection of control breaches.

4.2 Potential Benefits of GAI Integration

Interview data and simulated case scenarios suggest that GAI can significantly improve audit efficiency and control reliability. Key perceived benefits include:

- **Automated risk identification** through real-time anomaly detection in transactional data.
- **Enhanced predictive analysis**, enabling auditors to simulate the outcomes of different control strategies.

- **Generative reporting capabilities**, which reduce time spent on routine documentation.
- **Increased transparency**, through continuous monitoring and audit trail generation.

Stakeholders emphasized the role of GAI in transforming internal audit from a reactive, compliance-driven function into a strategic, forward-looking tool.

4.3 Case Study Insights

The two case studies highlighted institutional differences in digital readiness. In the university setting, where partial ERP systems were already in use, the simulated integration of a GAI module demonstrated improvements in real-time audit reporting and reduced workload. Conversely, the pre-university institution faced structural barriers, including insufficient IT infrastructure and staff with limited digital skills.

These findings underscore the importance of context in the successful implementation of AI solutions. GAI cannot function effectively without clean, structured data, interoperable systems, and skilled personnel.

4.4 Challenges and Barriers to Adoption

Despite the benefits, several barriers to GAI adoption were consistently identified:

- **Data quality and integration**: Audit-relevant data is often incomplete, inconsistent, or scattered across systems.
- **Cost and institutional inertia**: Budget constraints and resistance to change pose significant obstacles, particularly in schools with limited administrative capacity.
- **Ethical and legal concerns**: Issues related to algorithmic transparency, audit independence, and data privacy emerged as critical points in interviews.

These concerns reflect a broader need for regulatory guidance and sector-specific digital strategies that ensure responsible AI adoption in public administration.

5. Strategic Recommendations

Based on the empirical findings and analysis, several strategic directions are proposed to support the effective integration of Generative Artificial Intelligence (GAI) into internal audit and managerial control systems within public education institutions.

5.1 Establishing a Digital Audit Readiness Framework

Institutions should begin by conducting a **digital maturity assessment** to identify gaps in infrastructure, data management, and staff competencies. This would enable tailored action plans aligned with both technological capabilities and institutional objectives. Key elements of such a framework include:

- Data standardization and consolidation across departments
- Integration of existing financial systems with audit platforms
- Clear protocols for data governance and access control

5.2 Investing in Training and Capacity Building

Effective use of GAI depends not only on the availability of technology but also on human expertise. Thus, targeted **training programs for internal auditors and financial controllers** are essential. These should focus on:

- Understanding AI-generated insights and limitations
- Interpreting predictive models responsibly
- Ethical and legal aspects of automated decision support

Collaborations with universities and professional bodies can support the design of continuous education modules specific to audit innovation in the public sector.

5.3 Developing Institutional AI Governance Policies

To ensure transparency, accountability, and ethical use of AI tools, institutions must adopt **internal policies on AI usage**. These policies should address:

- The scope and limits of GAI in auditing and decision-making
- Validation and supervision mechanisms for AI-generated outputs
- Compliance with national data protection and public finance regulations

This step is crucial to avoid over-reliance on algorithms and maintain the professional judgment of auditors.

5.4 Encouraging Pilot Projects and Cross-Institutional Collaboration

The implementation of GAI should begin with **pilot projects** in selected institutions, allowing for experimentation, adjustment, and knowledge sharing. Ministry-level support for cross-institutional collaboration and funding programs can foster scalable innovation across the education system.

6. Conclusions

This paper has examined the potential of Generative Artificial Intelligence (GAI) to enhance internal audit and managerial control systems within Romanian public education institutions. The findings highlight both the **transformative capacity** of GAI and the **institutional challenges** that must be addressed to achieve meaningful and sustainable implementation.

Through a mixed-method research design, the study demonstrated that GAI can significantly contribute to **audit automation**, **predictive analysis**, and **real-time monitoring**, thereby improving both the efficiency and transparency of internal processes. The case studies illustrated that the impact of GAI depends heavily on institutional readiness, particularly in terms of IT infrastructure, data quality, and staff expertise.

At the same time, several **critical barriers** were identified, including the fragmented nature of financial and audit data, resistance to change, and concerns about algorithmic transparency and ethical use. These findings point to the necessity of a **strategic, well-governed approach** that combines technological adoption with policy development and capacity building.

By building on the author's previous doctoral research, this paper contributes to the emerging literature at the intersection of **public sector audit innovation, education management, and artificial intelligence**. It calls for a shift in how audit and control are conceptualized in public education—moving from compliance-oriented models to **intelligent, adaptive systems** capable of supporting strategic governance.

Future research could expand on this study by evaluating pilot implementations of GAI in public sector institutions, developing audit-specific AI governance frameworks, and exploring the long-term impact of digital audit transformation on institutional performance.

References

1. Adamopoulou, E. and Moussiades, L., 2020. Chatbots: History, technology, and applications. *Machine Learning with Applications*, 2, 100006.
2. Agrawal, A., Gans, J.S. and Goldfarb, A., 2019. Artificial intelligence: The ambiguous labor market impact of automating prediction. *Journal of Economic Perspectives*, 33(2), pp.31–50.

3. Appelbaum, D., Showalter, D.S., Sun, T. and Vasarhelyi, M.A., 2021. A framework for auditor data literacy. *Accounting Horizons*, 35(2), 5pp.–25.
4. Davenport, T.H. and Kim, J., 2013. *Keeping up with the quants: Your guide to understanding and using analytics*. Harvard Business School Publishing.
5. Flyvbjerg, B., 2001. *Making social science matter: Why social science fails and how it can succeed again*. Cambridge University Press.
6. Gendron, Y., Andrew, J. and Cooper, C., 2022. The perils of artificial intelligence in academic publishing. *Critical Perspectives on Accounting*, 87, 102411.
7. Hall, M., 2010. Accounting information and managerial work. *Accounting, Organizations and Society*, 35(3), pp.301–315.
8. Korhonen, T., Selos, E., Laine, T. and Suomala, P., 2020. Exploring the programmability of management accounting work for increasing automation. *Accounting, Auditing & Accountability Journal*.
9. Legea nr. 672/2002 privind Auditul Public Intern, republicata.
10. OSGG nr. 600/2018 privind controlul intern managerial in institutiile publice.
11. Regulamentul UE 2024/1689 privind normele armonizate privind inteligenta artificiala.
12. Salijeni, G., Samsonova-Taddei, A. and Turley, S., 2019. Big Data and changes in audit technology: Contemplating a research agenda. *Accounting and Business Research*, 49(1), pp.95–119.
13. Samiolo, R., Spence, C. and Toh, D., 2023. Auditor judgment in the fourth industrial revolution. *Contemporary Accounting Research*.
14. Susskind, R. and Susskind, D., 2015. *The future of the professions: How technology will transform the work of human experts*. Oxford: Oxford University Press.