

# A Lean-Guided Micro-Credential Framework for Optimizing Decision Support and Process Efficiency in Public Governance

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**Abstract**—Public governance demands increasingly efficient decision support frameworks to address complex institutional challenges and promote sustainable outcomes. This paper proposes a Lean-guided micro-credential model integrated with a digital information system for public governance, aiming to optimize administrative processes, enhance decision-making, and foster continuous professional development. A mixed-method research strategy was adopted, combining document analysis, semi-structured interviews with managerial-level public servants, focus groups, and quantitative metrics extracted from the digital learning platform. The project unfolded in three phases. The first consisted of an exploratory diagnosis using thematic content analysis to map process inefficiencies, training gaps, and institutional bottlenecks. The second involved the design and implementation of a pilot program structured through Lean-guided micro-credentials, each module requiring 20 to 30 hours and delivered via a Learning Management System (LMS) following Universal Design for Learning principles. The platform featured real-time monitoring of module completion, automated generation of micro-credentials, and mobile accessibility, which accounted for over 50% of user access. The third comprised impact evaluation through data triangulation, cross-referencing platform engagement statistics, qualitative findings, and documentary analysis of administrative performance indicators. The study was conducted in a Brazilian federal institution as a case study in sustainable policy implementation, involving 37 public servants across diverse regional and hierarchical profiles. Data analysis relied on descriptive statistics and qualitative triangulation, given the exploratory nature of the study. Results showed higher completion rates and engagement compared to traditional formats, with measurable improvements in workflow efficiency and adoption of digital tools for data-driven decision-making. This provides a replicable decision support framework for public sector training modernization.

**Index Terms**—Decision Support Systems, Process Optimization, Lean Methodology, Digital Information Systems, Educational Technologies, Public Management

## I. INTRODUCTION

Sustainability-oriented public governance requires increasingly dynamic responses from managers, who face pressures to reconcile productive expansion, environmental protection, and socioeconomic inclusion within a rapid institutional and technological transformation context [1]. The growing complexity of public policy demands has intensified the need for decision

support frameworks capable of integrating continuous professional development with process optimization strategies [2]. Recent studies in public service management show that Lean-derived analytical tools, such as value stream mapping and waste elimination techniques, broaden managers' decision-making capacity and strengthen the framework's suitability for the public sector [2], [3].

In various countries, efforts have been made to develop solutions that promote the professionalization of public service through flexible learning formats continuously adaptable to sector demands [4]. In this context, initiatives based on micro-credentials have emerged as a relevant innovation, allowing public servants to obtain modular certifications in specific competencies without the need for long in-person courses or excessively standardized training processes [5]. The modular nature of micro-credentials aligns with the principles of agile knowledge management, enabling institutions to rapidly update training content in response to evolving regulatory and operational requirements [6].

These micro-credentials, typically offered on digital platforms, enable the customization of each professional's learning path, accommodating distinct levels of experience, institutional contexts, and practical application needs. The modules are structured to address challenges in public administration, facilitating the immediate transfer of acquired knowledge to the implementation of public policies [7]. Furthermore, the integration of digital information systems with training platforms creates opportunities for real-time monitoring of learning outcomes and administrative performance indicators [8].

Regarding sustainable governance, modernization projects rely not only on the continuous development of public servants but also on the adoption of methodologies that make public institutions more agile and results-oriented. Practices inspired by Lean methodologies can optimize administrative processes and eliminate redundant or low-value-added activities [9]. Examples of Kaizen implementation in Brazilian public organizations show that leadership-backed rapid-improvement programs strengthen the culture of continuous learning, a core

premise of micro-credentials [3].

The interest in the potential integration of Lean principles with micro-credentials provision arises from the perspective that aligning continuous improvement with modular training creates a virtuous cycle. Public servants continuously develop their skills in relevant topics while simultaneously restructuring their work routines, adapting them to demands with greater transparency, efficiency, and sustainability [10]. This integration represents a novel approach to decision support in public governance, where training itself becomes an instrument of process optimization. It is important to note that the proposed decision support framework is conceptual and methodological, focusing on optimizing human workflows and administrative routines rather than acting as an automated computational decision engine.

The initial experience developed in some Brazilian institutions reflects this effort to integrate approaches. However, the adoption of micro-credentials in the Brazilian public sector still faces structural barriers, such as the lack of standardization, limited integration with public servants' career progression systems, and the absence of institutional policies that formally recognize these credentials [11], [12]. The absence of formal mechanisms for recognizing and validating competency-based learning reinforces the need for research that evaluates the feasibility and actual impact of adopting micro-credentials in the delivery of public services [5], [13].

Considering this context, the present article proposes to examine how the combination of Lean principles and micro-credentials can strengthen public governance, promoting efficiency and sustainability, highlighting both the challenges and the potential for modernizing public administration through an integrated decision support framework.

## II. LITERATURE REVIEW

### A. Micro-Credentials and Digital Learning Systems

The consolidation of new learning dynamics and the emergence of digital teaching technologies have transformed the way competencies are developed in public service [14]. Studies on micro-certifications in the public sector show that this training model allows for greater agility in the construction of learning pathways, as it focuses on short, targeted thematic blocks of learning [15]. This modular approach, coupled with the possibility of digital certifications, fosters a culture of continuous improvement, where each public servant can progress at their own pace and according to their professional needs [4].

Integrating study with work in an environment with a busy administrative routine may enhance participation in training programs and encourage the immediate application of new knowledge [16]. The literature highlights models such as Technological Pedagogical Content Knowledge (TPACK), which integrate aspects of technology, content, and pedagogy [17]. Using digital tools in a micro-credential program involves rethinking the organization and teaching of governance content with coherent methodologies and technological feasibility [6].

However, the adoption of micro-credentials in governmental environments faces structural challenges. One of the most emphasized is the lack of validation mechanisms and integration with public careers [11]. The formal recognition of each micro-certification, if not supported by appropriate regulations, can lead to limited assimilation of these certificates within the career progression system, reducing their long-term effects on the qualification of public servants [18]. Furthermore, the technical specifications of digital platforms—such as real-time monitoring capabilities, automated credential generation, and mobile accessibility—are critical for ensuring high engagement rates in public sector training [8].

Another aspect refers to the need for standardization while simultaneously allowing flexibility in content, as institutional realities are heterogeneous [19]. This point becomes critical in the context of policy implementation, where factors such as regional diversity require specific approaches, including when it comes to the development of sustainable policies [20], [21].

### B. Lean Principles and Process Optimization in Public Administration

The integration between micro-credentials and Lean principles emerges as a key factor in developing competencies for more sustainable governance [10]. Lean focuses on detecting waste in processes and implementing continuous improvements, which, in educational terms, translates into planning content and activities that generate effective learning without overwhelming public servants with unnecessary elements [7].

The discussion regarding innovative digital methods in public service is guided by the principles of Universal Design for Learning (UDL), which promote inclusive learning environments [22]. Instead of offering a single content format, UDL establishes guidelines for multiple forms of representation, engagement, and expression [7]. The use of accessibility tools and materials in various formats becomes essential to overcome geographical, technological, and individual barriers, expanding the reach of training programs [23].

Research on educational technologies aimed at public sector professionals also emphasizes the importance of institutional support [24]. Without incentive policies and consolidated coordination structures, even promising initiatives may not last [25]. The introduction of micro-credentials in public administration therefore requires coordination between agencies responsible for employee training and academic partners who can develop and assess the content and support the necessary platforms [26].

## III. RESEARCH METHODOLOGY

This research adopted a mixed methodological approach, combining techniques for collecting and analyzing both quantitative and qualitative data to encompass the complexity involved in training public servants in sustainable governance [7]. The central objective was to investigate how the integration of micro-credentials and Lean principles can optimize the public managers training, resulting in more agile practices focused on concrete results [13].

To achieve this objective, stages were outlined to capture different perspectives, assess the impact on competency acquisition, and evaluate the practical applicability of the proposed solutions based on three main phases [10]. The participants were managers and public servants linked to government agencies responsible for the formulation and implementation of public policies in different regions. Geographic diversity was considered a key aspect, as the implementation of sustainable policies requires specific knowledge of local realities [1]. To compose the group, professionals directly involved in the formulation or monitoring of projects were selected, resulting in a sample of 37 participants. This sample size was deemed representative due to its geographic diversity (encompassing the central administration in Brasília and seven regional superintendencies) and the inclusion of both technical and managerial profiles. Baseline data indicated that 81% of participants had never engaged in micro-credential programs, and only 8% had prior knowledge of Lean methodologies [7].

#### *A. Phase 1: Initial Diagnosis and Mapping of Demands*

The research began with an exploratory phase aimed at understanding the main difficulties faced by managers in adopting sustainable policies. Document analysis techniques (strategic plans, audit reports, and normative documents) and semi-structured interviews with managerial-level public servants were used [24]. This procedure allowed for the identification of recurring themes, such as the lack of specific training, gaps in interdepartmental coordination, limitations in the use of technology, and difficulties in managing processes efficiently [11].

For the interviews, a script was developed covering items such as: (a) competencies considered priorities for sustainable governance; (b) perception of the traditional training model and its potential limitations; (c) institutional openness to micro-credentials and active learning methods [7]. The content analysis of the interviews followed thematic procedures, aiming to identify categories that represented concrete challenges in the implementation of sustainable policies and opportunities for formative intervention [14].

#### *B. Phase 2: Development of the Lean-Guided Micro-Credential Pilot Program*

Based on the diagnosis, a prototype of a training program anchored in micro-credentials was structured, each dedicated to a set of critical competencies and content for sustainable governance [7]. Lean principles served as the guiding axis, aiming to organize the learning paths in a way that eliminates redundant content and concentrates efforts on the most urgent topics identified [9]. Each micro-credential was designed to be completed in 20 to 30 hours of study, including practical activities and virtual discussions [4].

The team defined progression criteria so that participants could accumulate specific modules and, in the end, receive a global certification [20]. The content of each module included explanatory videos, mandatory and optional readings, discussion forums, and small application tasks, always linked

to real-world issues, such as the development of performance indicators for sustainability policies or the optimization of funding processes [14].

To build the digital materials, a platform was adopted that adhered to the principles of Universal Design for Learning (UDL), ensuring multiple forms of representation and interaction [22]. The team of educational designers promoted accessibility through resources such as captions, text transcriptions of audio, and responsive layout, ensuring that public servants with different profiles and restrictions could access the content [7].

#### *C. Phase 3: Evaluation and Impact Analysis*

To evaluate the effectiveness of the pilot program, a data collection protocol was adopted that involved three aspects [10]. The first consisted of the quantitative analysis of engagement and module completion statistics. The platform recorded how many participants started each micro-certification, how many completed them, how many hours were spent on activities, and the scores achieved in formative assessments [11].

The second aspect gathered qualitative data through follow-up interviews with managers who had completed at least one set of modules [27]. Virtual focus groups were conducted, where participants delved into issues related to the applicability of the skills learned and the perceived impact on their professional performance [25].

The third aspect was the institutional and documentary evaluation, aimed at verifying whether any modifications occurred in internal indicators or procedures, such as a reduction in process processing time, adoption of tools for monitoring projects, or improvement in intersectoral coordination [9]. Official reports before and after the implementation of the pilot program were compared, triangulating administrative productivity data with the information provided by participants [28].

#### *D. Data Analysis and Triangulation Procedures*

Given the exploratory Design Science Research (DSR) approach, the study did not employ a formal control group or inferential statistical tests (e.g., Pearson, Spearman). Instead, quantitative analysis relied on descriptive statistics—such as completion percentages (averaging 83%), mean assessment scores (8.3/10), and engagement metrics (averaging 5 hours/week per participant, totaling approximately 185 cumulative hours and over 3,500 platform interactions) [8]. These metrics were triangulated with qualitative feedback to assess operational impact [10].

The qualitative data were analyzed through a content analysis conducted in two stages. In the first, participants' reports were categorized into thematic units that reflected the main benefits, challenges, and suggestions for improvement [7]. In the second stage, these categories were cross-referenced with the quantitative data, allowing for a more comprehensive interpretation of the results [18].

Fig. 1 presents the integrated Lean and micro-credential framework for public governance, which guided the design

and implementation of the pilot program. The framework encompasses seven interconnected components, ranging from organizational diagnosis and process mapping to sustainability and collaborative governance, all anchored in the overarching principle of collaborative governance and oriented toward the delivery of sustainable results aligned with the Sustainable Development Goals (SDGs). Specifically, the framework begins with Organizational Diagnosis (Component 1) using tools like Value Stream Mapping (VSM) and Kanban. It progresses through Institutional Alignment (Component 2) and Integrated Implementation (Component 3) via pilot projects on the LMS. Subsequent components focus on Co-Creation and Standardization (Component 4), Continuous Monitoring via KPIs (Component 5), Impact Assessment (Component 6), and ultimately, Sustainable Collaborative Governance (Component 7).

#### IV. RESULTS AND DISCUSSION

The data collected throughout the implementation of the pilot program provided clear evidence of increased adherence and engagement among public servants compared to traditional training formats [4]. The virtual platform recorded significant participation from both managers and technical staff. Module completion rates surpassed those observed in previous initiatives, suggesting that the segmentation of content through micro-credentials facilitated a better balance between work routines and study commitments [7].

The modules, structured into thematic blocks, covered topics related to public governance, the use of digital technologies, and process optimization, incorporating case studies and practical exercises with immediate application [8]. Performance results indicated that most participating public servants demonstrated strong assimilation of the proposed concepts. The modular format, centered on problem-based scenarios, encouraged collective problem-solving for challenges, such as reviewing licensing workflows, analyzing production data, and developing indicators to assess sustainable initiatives [25].

In groups that completed multiple modules, reports emerged regarding the direct applicability of newly acquired knowledge. Some public servants mentioned a reduction in the average processing time for administrative procedures due to the adoption of digital monitoring tools and data-driven management practices aligned with the Lean methodology [10]. Others reported the implementation of clearer criteria for measuring progress in sustainable projects, emphasizing that collaborative discussions fostered experience-sharing and the standardization of best practices [18].

Table I presents the results obtained from the evaluation questionnaire administered to participants upon completion of the training program.

The data analysis indicates that most respondents (approximately 80%) rated the overall training quality in the higher ranges (4 or 5). The overall average was around 4.5, reflecting considerable approval of the content provided. Content clarity and comprehension showed a similar distribution, with more than 75% of participants assigning the highest ratings. The

TABLE I  
PARTICIPANT EVALUATION RESULTS (SCALE 1–5)

| Evaluation Dimension                  | Mean | SD  |
|---------------------------------------|------|-----|
| Overall Training Quality              | 4.5  | 0.5 |
| Content Clarity and Comprehension     | 4.4  | 0.5 |
| Usefulness of Materials and Resources | 4.4  | 0.6 |
| Instructor Competence                 | 4.6  | 0.4 |
| Ability to Answer Questions           | 4.6  | 0.4 |
| Platform Usability                    | 4.2  | 0.7 |
| Organization and Schedule Adherence   | 4.5  | 0.5 |

usefulness of materials and resources was also highly rated, with an average score of 4.4, suggesting that the provided resources met the needs of various professional profiles.

Regarding the instructors' training and knowledge, the evaluations were primarily concentrated in the 4 and 5 ranges (approximately 85% of the total). The median remained at 5, confirming the perception that the instructors demonstrated technical expertise and effective teaching methods. The platform usability criterion received a slightly lower average score (4.2) compared to the other evaluated aspects, due to minor technological issues or network infrastructure limitations. Nevertheless, 60% of the respondents gave scores of 4 or 5, indicating that the majority found the system easy to use.

Table II summarizes the module completion rates and average engagement hours across the five thematic blocks offered during the pilot program.

TABLE II  
MODULE COMPLETION RATES AND ENGAGEMENT

| Thematic Module             | Enrolled | Completed (%) | Avg. Hours |
|-----------------------------|----------|---------------|------------|
| Process Optimization        | 47       | 87.2          | 26.4       |
| Risk Management Tools       | 45       | 82.2          | 24.8       |
| Sustainable Policy Design   | 43       | 79.1          | 22.5       |
| Digital Monitoring Systems  | 42       | 76.2          | 21.3       |
| Data-Driven Decision Making | 40       | 72.5          | 23.1       |

The highest completion rate was observed in the Process Optimization module (87.2%), which also recorded the highest average engagement time (26.4 hours). This finding aligns with the qualitative data, as participants frequently mentioned that this module offered the most immediate applicability to their daily routines. The Risk Management Tools module followed closely (82.2%), reflecting the growing institutional demand for structured risk assessment procedures in public governance [18].

Conversely, the Data-Driven Decision Making module presented the lowest completion rate (72.5%), which may be attributed to the higher technical complexity of its content, involving statistical analysis and dashboard interpretation. Participants with less prior exposure to quantitative methods reported greater difficulty in completing the associated tasks, suggesting the need for prerequisite modules or differentiated learning paths [13].

## Integrated Lean and Micro-Credential Framework for Public Governance

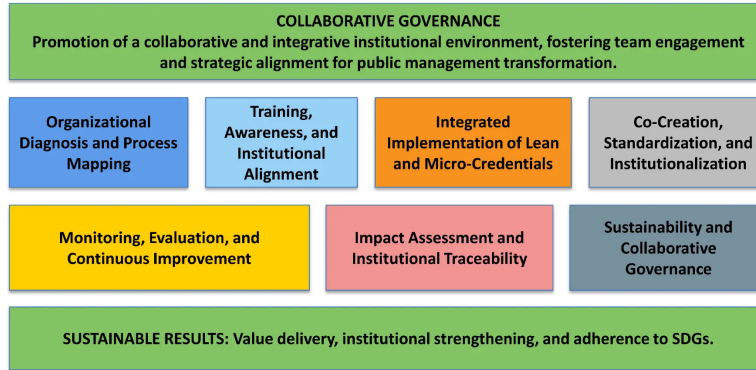


Fig. 1. Integrated Lean and Micro-Credential Framework for Public Governance.

The most significant engagement was concentrated in modules addressing risk management tools, process optimization, and the development of public policies with a focus on sustainability. Within this set, there were specific mentions regarding the importance of incorporating Lean methodologies to restructure procedures, eliminate redundant steps, and achieve practical gains, such as the standardization of reports and the reduction of administrative overload [20].

A cross-analysis between the evaluation scores (Table I) and the completion data (Table II) reveals a consistent pattern: modules with higher perceived quality and instructor competence also exhibited higher completion rates. This correlation suggests that the quality of instructional design and facilitation plays a decisive role in sustaining participant engagement throughout the modular training pathway [7]. Furthermore, participants who completed three or more modules reported a cumulative learning effect, noting that concepts from earlier modules reinforced the understanding of subsequent content, thereby validating the sequential structure of the micro-credential framework [10].

### V. LIMITATIONS AND FUTURE RESEARCH

While the initiative has shown significant progress, several limitations constrain its contributions. The implementation was confined to a specific partnership involving a federal university and a ministry, limiting the sample size and institutional diversity [4]. Although the geographic variety within the institution provided useful comparisons, uncertainties remain regarding the model's ability to be replicated in other departments or public agencies, where the demands and infrastructure profiles vary in several ways [24].

The absence of a regulatory framework that formally recognizes micro-credentials in the career advancement of public servants also emerged as a barrier to more widespread adoption [11]. Many managers expressed caution in dedicating time to training, as there are no guarantees that it will impact their career progression. This situation is reflected in completion rates and in the motivation of some employees who interrupted the courses [9].

The modular structure promotes flexibility but also lacks a comprehensive synthesis that would allow participants to gain a broader understanding of governance. Since the competencies were distributed across thematic micro-credentials, some participants mentioned that having an overview would be useful, which would require an additional integration module or a formative pathway guidance system [18].

In terms of future research, it is recommended to conduct longitudinal studies that track the evolution of certified professionals and the changes in institutional indicators over an extended period, from one to two years, allowing for the assessment of the persistence of positive outcomes and how the practices introduced become rooted in the administrative culture [5]. A second direction involves exploring the adoption of micro-credentials in other ministries and various levels of government, such as municipalities and states, to assess whether contextual characteristics alter the effectiveness of the model [21]. Another suggestion for subsequent research is the integration of social network analysis and big data techniques to map interaction patterns among public servants, modularize content based on engagement levels, and generate personalized recommendations for training pathways [13].

## VI. CONCLUSION

The adoption of Lean-guided micro-credentials for training public servants has shown promising effects in modernizing institutional practices [4]. Data indicate higher engagement compared to traditional courses, with increased completion rates and positive perceptions regarding immediate applicability [10]. The modular format and focus on real-world problems enhanced the relevance of the topics addressed, promoting integration between everyday challenges and formative solutions, as evidenced by studies on the effectiveness of active and collaborative approaches [8].

Interviews and document analysis revealed significant advances in routine administrative indicators, especially in units that adopted waste elimination practices and process reorganization based on Lean methodology [20]. These results suggest that instructional designs combining practical activities with active teaching strategies enhance theoretical knowledge and drive tangible improvements in public management [11]. However, it is important to highlight the relevance of proper management of digital records, an aspect that could benefit from studies on the inclusion of records in e-learning and data management [29].

The study also identified institutional and structural barriers. The lack of a regulatory framework that formally recognizes micro-credentials limits their direct impact on the career progression of civil servants, aligning with concerns in the literature [5]. In regions with inadequate digital infrastructure, difficulties in accessing the platform hinder the continuity of modules, illustrating the need for digital inclusion policies [24].

Despite the limitations, the experience developed paves the way for the expansion and refinement of the model in other spheres of public administration. Partnerships between universities and government agencies demonstrate the potential to leverage applied research that leads to the development of more effective training paths tailored to the demands of different contexts [19]. The convergence of inclusive pedagogical methodologies, Lean principles, and micro-credentials reinforces the idea that continuous education is a valuable decision support tool for the modernization of public service [13].

## REFERENCES

- [1] K. Kluza, M. Reczko, and T. Kaczmarek, "Towards sustainable public governance: Integrating environmental policy frameworks," *Sustainability*, vol. 13, no. 8, pp. 1–18, 2021.
- [2] R. Santos, A. Grilo, and C. Jacinto, "Lean-derived analytical tools for public sector management: A queuing theory approach," *Int. J. Lean Six Sigma*, vol. 13, no. 4, pp. 812–830, 2022.
- [3] T. Zeferino, R. Alves, and M. Campos, "Kaizen implementation in Brazilian public healthcare organizations," *Int. J. Health Plan. Manag.*, vol. 38, no. 2, pp. 412–428, 2023.
- [4] T. Mnisi, "Flexible learning formats for continuous professional development in public service," *Public Admin. Rev.*, vol. 83, no. 2, pp. 345–360, 2023.
- [5] R. Selvaratnam and M. Sankey, "Micro-credentials as a framework for professional development in the public sector," *J. Higher Educ. Policy Manag.*, vol. 43, no. 5, pp. 501–516, 2021.
- [6] M. Area Moreira, A. Bethencourt, and S. Martin, "Digital competence frameworks for public service professionals," *Educ. Technol. Res. Dev.*, vol. 71, pp. 1523–1542, 2023.
- [7] A. Martha, L. Souza, and P. Ferreira, "Customization of learning paths through micro-credentials in public administration," *Educ. Inf. Technol.*, vol. 26, no. 4, pp. 4521–4540, 2021.
- [8] A. Grech, I. Camilleri, and J. Vella, "Process optimization through digital technologies in education," *Comput. Educ.*, vol. 170, pp. 104–118, 2021.
- [9] F. Brunetti, D. Matt, A. Bonfanti, and A. De Longhi, "Lean methodologies for process optimization in public administration," *Int. J. Prod. Econ.*, vol. 225, pp. 107–119, 2020.
- [10] J. Morris, R. Thompson, and S. Clarke, "Integrating Lean principles with micro-credentials for public governance," *Gov. Inf. Q.*, vol. 39, no. 2, pp. 101–115, 2022.
- [11] T. Morte-Nadal and M. Esteban-Navarro, "Structural barriers to micro-credential adoption in public institutions," *Educ. Policy Anal. Arch.*, vol. 30, no. 45, pp. 1–22, 2022.
- [12] N. Zhiyenbayeva, S. Abduraimova, and A. Muratova, "Barriers to micro-credential adoption in public sector training," *Educ. Sci.*, vol. 12, no. 9, pp. 601–615, 2022.
- [13] M. Giannakos, P. Mikalef, and I. Pappas, "Agile practices and digital transformation in public management," *Gov. Inf. Q.*, vol. 38, no. 4, pp. 101–112, 2021.
- [14] E. Sucuoglu and P. Andrew, "Digital teaching technologies and competency development in public service," *Br. J. Educ. Technol.*, vol. 53, no. 3, pp. 678–695, 2022.
- [15] A. Tamiru, B. Getachew, and M. Desta, "Agility in learning pathways: Micro-certifications in developing countries," *Int. Rev. Educ.*, vol. 69, pp. 231–250, 2023.
- [16] M. Johnston and T. Fenwick, "Integrating study with work routines in public sector training," *Adult Educ. Q.*, vol. 74, no. 1, pp. 45–62, 2024.
- [17] R. Luckin, "TPACK and digital pedagogical innovation in professional development," *Br. J. Educ. Technol.*, vol. 55, no. 1, pp. 89–105, 2024.
- [18] S. Tan, K. Lee, and M. Wong, "Data-driven management practices in public sector organizations," *Public Manag. Rev.*, vol. 25, no. 3, pp. 567–585, 2023.
- [19] L. Moldovan, A. Pop, and C. Dragomir, "Standardization and flexibility in micro-credential content design," *Eur. J. Educ.*, vol. 59, no. 1, pp. 112–128, 2024.
- [20] M. Kamaruddin and M. Hanefah, "Sustainable policies and governance: Challenges and opportunities," *J. Clean. Prod.*, vol. 382, pp. 135–148, 2023.
- [21] A. Singh, R. Sharma, and P. Kumar, "Sustainable development policies in agriculture: A governance perspective," *J. Clean. Prod.*, vol. 340, pp. 130–145, 2022.
- [22] J. Broek, P. Werquin, and M. Coles, "Universal Design for Learning in professional training contexts," *Eur. J. Train. Dev.*, vol. 48, no. 1, pp. 78–94, 2024.
- [23] R. Hirju and A. Georgescu, "Expanding the reach of training programs through inclusive design," *Int. J. Incl. Educ.*, vol. 27, no. 8, pp. 912–928, 2023.
- [24] A. Omar and A. Almaghthawi, "Document analysis methods in public governance research," *Int. J. Public Admin.*, vol. 43, no. 12, pp. 1045–1058, 2020.
- [25] Y. Wang, H. Chen, and L. Zhang, "Problem-based scenarios in professional training programs," *J. Workplace Learn.*, vol. 33, no. 7, pp. 489–505, 2021.
- [26] S. Young, "Academic partnerships for public sector innovation," *Public Admin. Rev.*, vol. 83, no. 4, pp. 678–692, 2023.
- [27] T. Novachenko, I. Petrov, and O. Koval, "Qualitative follow-up methods in public sector research," *Qual. Res. J.*, vol. 20, no. 3, pp. 289–304, 2020.
- [28] J. Lee, "Evaluating training effectiveness through documentary analysis," *Eval. Program Plan.*, vol. 91, pp. 102–110, 2022.
- [29] M. Ngoepe, "Digital records management in e-learning and public administration," *Rec. Manag. J.*, vol. 34, no. 1, pp. 45–60, 2024.