

Improving Teacher Performance through the Development of an Integrated Quality Assurance System Based on Total Quality Management (TQM)

Sudir^{1, a)}, Mohammad Furqon Hidayatullah^{2, b)}, Munawir Yusuf^{2, c)},
Subagya^{2, d)}

Author Affiliations

¹*Educational Science Study Program,
Sebelas Maret University, Indonesia*

²*Universitas Sebelas Maret, Indonesia*

Author Emails

^{a)} Corresponding author: sudir@student.uns.ac.id

^{b)} mohammadfurqon@staff.uns.ac.id

^{c)} munawiryusuf@staff.uns.ac.id

^{d)} ssubagya60@staff.uns.ac.id

Abstract. The development of an Integrated Quality Assurance System based on Total Quality Management (SPMT-TQM) aims to improve teacher performance in Pondok Pesantren Baitul Qur'an. This study aims to develop a practical and applicable guidebook for implementing SPMT-TQM as a model of quality assurance to enhance teacher performance. The research approach used is Research and Development (R&D) with the ADDIE development model, which consists of Analysis, Design, Development, Implementation, and Evaluation. However, this study focuses only on assessing the feasibility level of the developed system model. The validation subjects consist of 8 experts, including education experts (2 people), language experts (2 people), management experts (2 people), and Islamic boarding school experts (2 people). The research instrument uses a Likert scale of 1–4 to assess each validator's opinion of the guidebook. The validation results are analyzed descriptively using percentage analysis to determine feasibility. The results showed that the Integrated Quality Assurance System model based on TQM (SPMT-TQM) is categorized as "feasible" to be implemented to improve teacher performance, as indicated by the average scores: 3.94 from education experts, 3.75 from language experts, 3.79 from management experts, and 3.73 from Islamic boarding school experts. These results confirm that the developed guidebook is appropriate and ready to be used as an internal quality assurance system to improve teacher performance in Pondok Pesantren Baitul Qur'an.

Keywords: Total Quality Management (TQM); integrated quality assurance; teacher performance; Islamic boarding school; model development

INTRODUCTION

The development and advancement of industry and technology in the era of the industrial revolution 4.0 have significantly influenced the transformation of learning environments across various educational levels. The concept of education 4.0 encourages the integration of technology, digital tools, and innovation into the teaching and learning process, fostering dynamic, accessible, and personalized education [1],[2]. This transformation is not only reshaping classrooms into interactive and intelligent spaces but also redefining the roles of educators and learners in preparing for future competencies [3],[4]. Within this context, teacher performance becomes a critical aspect to ensure the successful implementation of modern educational frameworks. As such, the development of an integrated quality assurance system based on total quality

management (tqm) is essential to support the continuous improvement of teaching standards and to adapt to the demands of the industrial revolution 4.0 [5],[6].

While technological advancements in the era of Industrial Revolution 4.0 have brought tremendous opportunities for transforming education, the successful realization of these opportunities largely depends on teacher performance. Teachers remain the central figures in facilitating meaningful learning, integrating technology, and ensuring the achievement of learning objectives [7],[8]. However, various studies and field observations reveal that many educators still rely on conventional teaching methods and show resistance toward using digital tools in their classrooms. In fact, gaps still exist in teachers' digital literacy and their ability to integrate technology effectively into pedagogical practices [9]. These limitations hinder the implementation of innovative and student-centered learning. Therefore, a systematic approach to improving teacher performance such as the development of an integrated quality assurance system based on Total Quality Management (TQM)—is needed to support professional growth, adapt to educational changes, and meet the demands of 21st-century learning [10].

The limited application of quality management principles by teachers was also evident from classroom observations conducted at Pondok Pesantren Baitul Qur'an. These observations revealed that many teachers continued to deliver material using one-way communication methods and relied primarily on printed textbooks or modules. The integration of interactive digital media in teaching was minimal. During the learning process, student engagement was low, and instructional activities lacked variety. When further explored through interviews, several teachers stated that the limited use of digital and student-centered methods was not due to rejection of technology, but rather the lack of access to structured professional development and institutional support. Most teachers had never received training in quality-based instructional design, nor were they guided through a clear system for evaluating and improving their teaching practices. In many cases, teaching strategies were based more on personal experience than on systematic approaches rooted in continuous quality improvement. These findings indicate that despite growing demands for innovation and accountability in education, many teachers still operate in environments that lack the necessary frameworks to support professional growth and instructional excellence.

As a supporting system that assists educators in improving teaching quality, a quality assurance model plays a vital role in shaping effective learning environments. A well-designed quality assurance system provides standards, structured feedback mechanisms, and continuous evaluation tools that can help teachers align their teaching with institutional goals and learner needs [11]. Furthermore, the implementation of an integrated quality assurance system can serve as an innovative solution to address various limitations commonly faced by teachers such as the lack of feedback, limited self-evaluation practices, and absence of institutional support for improvement [12]. In response to the issues identified in the field and the growing need for enhanced teaching performance, especially in Islamic educational settings, innovation is needed in the form of a Total Quality Management-based integrated model. The Integrated Quality Assurance System (SPMT-TQM) is designed to systematically assist educators by providing clear performance indicators, developmental guidelines, and mechanisms for continuous improvement. Several studies have shown that quality assurance systems rooted in TQM principles significantly contribute to teacher development, accountability, and institutional excellence [13].

Findings from previous research have confirmed that the implementation of Total Quality Management (TQM) in educational institutions contributes significantly to sustainability, internal effectiveness, and improved teacher performance [14],[15]. Several studies have also emphasized that TQM principles when supported by competent academic leadership and structured quality frameworks can enhance professional growth, teaching commitment, and institutional accountability [16],[17]. Nonetheless, the contextual application of TQM in specific learning environments, such as Islamic boarding schools, has not been deeply explored. This study aims to develop an Integrated Quality Assurance System (SPMT-TQM) tailored to the needs of such institutions. It is expected that the resulting model will support teacher performance improvement through clear standards, continuous feedback, and strategic professional empowerment [18],[19].

MATERIALS AND METHODS

This study is a type of research and development (R&D). The development process adopted the ADDIE model, which stands for Analysis, Design, Development, Implementation, and Evaluation [20]. The ADDIE model was selected because it provides a structured and systematic framework for developing educational models. However, this study only focused on the development stage up to the product validation process, aiming to determine the feasibility level of the SPMT-TQM model developed. To assess the feasibility of the product, an expert validation was conducted using a questionnaire instrument. The questionnaire contained indicators related to the content, presentation, language, and contextual relevance of the model guidebook. Each item was rated using a Likert scale from 1 to 4, with the following interpretations: 1 = not feasible, 2 = less feasible, 3 = feasible, and 4 = very feasible [21]. The validation was carried out by eight expert validators, consisting of two education experts, two language experts, two management experts, and two experts in Islamic boarding schools. The data collection methods included document analysis, expert judgment, and questionnaires.

The data obtained from the questionnaire were analyzed using percentage-based descriptive analysis to determine the feasibility level of the developed model. The categorization of feasibility scores referred to Arikunto [22], which classified percentage scores into four categories: very feasible (76–100%), feasible (56–75%), less feasible (40–55%), and not feasible (<40%) [23].

TABLE 1. Product Feasibility Criteria

Range	Category	Decision
81% – 100%	Very Good	Feasible
61% – 80%	Good	Feasible
41% – 60%	Enough	Inadequate
21% – 40%	Less	Not Feasible
< 20%	Not Good	Not Feasible

RESULTS AND DISCUSSION

Validation was conducted to determine the level of feasibility of the developed model. In this study, the validation results from education experts, language experts, management experts, and Islamic boarding school experts serve as the key findings in the results and discussion section. These validations are part of the Development stage in the ADDIE model framework, aiming to ensure that the SPMT-TQM model is appropriate, relevant, and applicable to the context of Islamic educational institutions. Based on the results of descriptive data analysis, the feasibility assessment from each group of expert validators showed high percentages. The education experts provided an average percentage score of 94.7%, which, according to Table 1, falls under the "Very Good – Feasible" category. The language experts gave a score of 93.7%, the management experts 94.2%, and the pesantren experts 93.0%, all of which also fall within the same category. These results indicate that the Integrated Quality Assurance System based on Total Quality Management (SPMT-TQM) is considered highly feasible and worthy of implementation in further stages.

The assessment conducted by material experts also contributed to evaluating the quality of the developed product. Based on the results of descriptive data analysis, the material substance presented in the SPMT-TQM model guidebook was declared suitable. This can be seen from the assessment results of material expert I, who gave a percentage score of 92.3%, which falls into the "Very Good – Feasible" category. Meanwhile, material expert II provided a score of 89.2%, which also falls into the same category. These results show that the content aspects of the developed Integrated Quality Assurance System are considered relevant, comprehensive, and accurate in accordance with the needs of quality improvement in Islamic boarding school education. Therefore, the product is categorized as "feasible" and can proceed to the next stage of development and implementation.

The implementation and evaluation stages within the ADDIE development model are designed to be conducted sequentially, with overlapping procedures for feasibility assessment by potential users. In this case, the model guidebook that has been developed and validated by education and material experts was then evaluated by four subject teachers as practitioners in the educational setting. As individuals directly involved in implementing institutional quality assurance, teachers provide essential insights into whether

the SPMT-TQM model is practical and applicable in real-world teaching environments. The results of the feasibility assessment from the four teachers show consistent support and positive responses. Specifically, teacher I assessed the model at 80%, teacher II at 91.1%, teacher III at 88.9%, and teacher IV at 90%. According to Table 1, these scores fall within the “Feasible” to “Very Feasible” categories. These results indicate that the developed SPMT-TQM model is perceived as highly relevant and usable by practitioners, thus forming a strong basis for further trials and limited implementation in the Islamic boarding school context.

The results of the assessment carried out by the subject teachers indicated a high level of enthusiasm in evaluating the feasibility of the developed model. As detailed in the analysis, teacher I provided a score of 80%, teacher II gave 91.1%, teacher III rated 88.9%, and teacher IV gave 90%. Based on Table 1, all these scores fall into the “Feasible” category. These findings reinforce the view that the Integrated Quality Assurance System based on Total Quality Management (SPMT-TQM) is not only theoretically sound but also practically acceptable by the teaching staff. Therefore, the results of these teacher assessments serve as a strong foundation for conducting further user trials involving teachers and administrators at Islamic boarding schools to evaluate the model's effectiveness in real implementation scenarios.

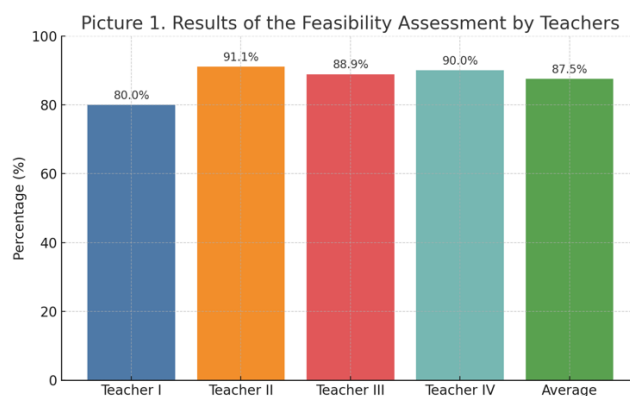


FIGURE 1. Results of the Feasibility Assessment by Teachers

The results of 44 students' responses to the SPMT-TQM model were obtained through limited field testing. The detailed assessment revealed that the display aspect of the model earned a score of 84.90%, the programming structure or systematic flow was rated at 84.20%, the learning relevance aspect scored 80.80%, and the content aspect received a score of 85.60%. These individual scores led to an average score of 83.88%, which, based on Table 1, falls within the "Feasible" category. These findings indicate that the Integrated Quality Assurance System based on Total Quality Management (SPMT-TQM) is well-received by students and is considered clear, structured, and supportive of the learning process. Following expert and practitioner validations, this student feedback further strengthens the conclusion that the model is feasible for broader implementation in Islamic boarding school environments.

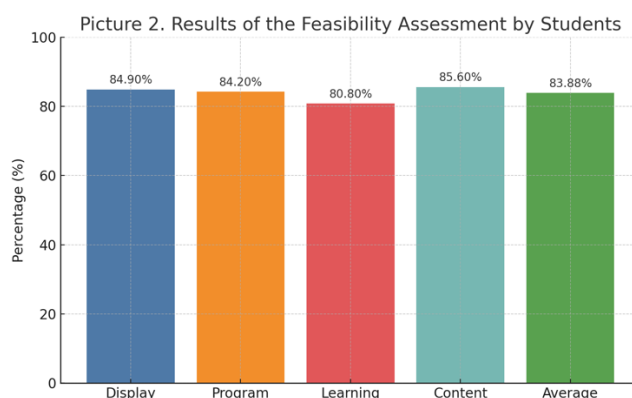


FIGURE 2. Results of the Feasibility Assessment by Students

This study has also provided empirical evidence that the developed model meets the practical needs of an institutional quality assurance system that supports teacher performance improvement. The results offer a conceptual and applicable framework, encouraging educational institutions especially Islamic boarding schools, not to remain passive in the face of evolving standards of educational quality. Structured systems such as the SPMT-TQM model align with broader movements in accreditation and educational quality assurance practices worldwide [24]. Furthermore, this study confirms that traditional top-down teacher development practices are no longer sufficient. Instead, a more collaborative and systemic approach, as reflected in the principles of Total Quality Management, is needed to foster a dynamic and sustainable improvement culture [25],[26]. In similar research, the implementation of TQM in religious-based institutions such as MI Al-Hidayah has also demonstrated positive effects on student development, reinforcing the relevance of this model for pesantren settings [27]. The success of the model also relates to internal factors such as leadership, motivation, and satisfaction, which all contribute to better teacher performance and school effectiveness [28]. Therefore, the SPMT-TQM model is expected to serve as a reliable and practical tool to promote teacher growth and institutional accountability in Islamic educational institutions.

The positive assessment results obtained throughout this study cannot be separated from the essential components embedded within the developed model. As stated in prior research, an effective educational framework must be responsive to actual institutional needs, contribute to teacher motivation and engagement, and present information in a clear and structured manner to enhance understanding and performance [29]. The SPMT-TQM model incorporates visual clarity, logical structure, and content coherence all of which are crucial for user comprehension and acceptance. In addition, thoughtful design elements such as layout consistency, use of visual markers, and accessibility of language can greatly influence how educational tools are received and utilized by teachers [30]. Research has shown that instructional systems designed with reflective practice in mind can promote professional growth and long-term improvement in teacher performance [31]. Furthermore, the integration of quality management principles into school systems has been proven to improve institutional effectiveness, accountability, and teacher development [32]. Therefore, the SPMT-TQM model not only meets practical quality standards but also supports the broader goal of creating a sustainable and empowering educational environment.

The interpretation of validation scores from educational and management experts also supports that the SPMT-TQM model possesses essential qualities to function as a practical and relevant quality assurance tool. This validation is inseparable from the completeness of the model components, including institutional goals, structured quality standards, performance indicators, and practical implementation strategies, which align with current expectations in educational management [33],[34]. The clarity of structure and logic in the guidebook also follows instructional design principles that prioritize usability, simplicity, and contextual fit [35]. Research also emphasizes that school-based quality systems embedded with Total Quality Management principles are more likely to be accepted by educators and administrators due to their integrative and improvement-oriented nature [16]. Therefore, the high feasibility ratings from validators indicate that the SPMT-TQM model is aligned with the real needs of pesantren-based institutions and is ready to be further applied and evaluated in field settings.

A growing number of studies show that the application of Total Quality Management in educational institutions contributes significantly to school accountability, teacher performance, and overall institutional improvement [36]. The implementation of the SPMT-TQM model is expected to build a culture of continuous reflection and systemic progress among educators in pesantren environments. Moreover, the use of structured systems such as this model also contributes to professional identity development and long-term pedagogical change [37]. In line with this, lifelong teacher learning and innovation are central to meeting the demands of 21st-century education, which the SPMT-TQM model aims to facilitate through its reflective, measurable, and adaptive design [38]. However, this study has limitations. It is focused on the product development and validation stages, without moving into long-term effectiveness testing or full-scale implementation. Furthermore, successful implementation requires institutional readiness, leadership commitment, and supportive infrastructure, which may vary between schools. Despite this, the model provides a structured path for institutions to begin developing sustainable quality management practices that are contextually relevant and future-oriented.

CONCLUSION

The development of the Integrated Quality Assurance System based on Total Quality Management (SPMT-TQM) plays a critical role in supporting the improvement of teacher performance and institutional quality, particularly in Islamic boarding schools. The model was developed systematically using the ADDIE framework and validated through expert reviews and limited user trials involving teachers and students. The results showed that the model meets feasibility standards in terms of content, structure, and practical implementation.

The SPMT-TQM model provides a clear framework that includes key components such as performance indicators, evaluation instruments, and continuous improvement mechanisms. These elements contribute to a more structured, measurable, and sustainable quality assurance system within educational institutions. Based on the validation results, the model is suitable for use in supporting reflective practice, teacher empowerment, and institutional development.

It is recommended that educational institutions—especially pesantren—consider adopting structured models such as SPMT-TQM to enhance professional growth, increase institutional accountability, and promote a culture of continuous improvement. Further research is encouraged to evaluate the long-term impact and effectiveness of the model when implemented at a broader scale.

REFERENCE

- [1] P. Konkol and D. Dymek, "Towards Education 4.0: Challenges and opportunities," in *Supporting Higher Education 4.0 with Blockchain: Critical Analyses of Automation, Data, Digital Currency, and Other Disruptive Applications*, 2023.
- [2] F. Yarahmadi, "Exploring the emergence of industrial revolution 4.0: A journey to higher education 4.0," in *Contributions to Economics*, 2021.
- [3] E. Tabane, N. Lindelani, and P. Mvelase, "Classroom of the future realization in the industrialization era: Towards 4.0 learning," in *Smart Innovation, Systems and Technologies*, 2021.
- [4] P. Poszytek and M. Jeżowski, "Competences 4.0 – How technological progress influenced the demand for competences on the verge of the fourth industrial revolution," 2020.
- [5] K. Gupta, "Some insights on engineering education 4.0," 2020.
- [6] M. M. Magagula and O. A. Awodiji, "The implications of the fourth industrial revolution on technical and vocational education and training in South Africa," *Soc. Sci. Humanit. Open*, 2024.
- [7] N. S. Shafiee and M. A. Ghani, "The influence of teacher efficacy on 21st-century pedagogy," *Int. J. Learn. Teach. Educ. Res.*, 2022.
- [8] T. C. Chun and M. N. L. Y. Abdullah, "Contemporary practices in teaching 21st-century skills at Malaysian primary schools: Do environmental factors and teacher's attitudes matter?," *Asia Pacific J. Educ. Educ.*, 2022.
- [9] D. Miguel-Revilla, J. M. Martínez-Ferreira, and M. S. Agustí, "Assessing the Digital Competence of Educators in Social Studies: An Analysis in Initial Teacher Training Using the TPACK-21 Model," *Australas. J. Educ. Technol.*, 2020, doi: 10.14742/ajet.5281.
- [10] R. K. Annan-Brew, I. J. Ezugwu, S. H. Surman, and J. Dadzie, "Enhancing pre-service teacher effectiveness: Integration of 21st-century skills during off-campus teaching experiences," *Eur. J. Educ.*, 2024.
- [11] J. Zajda, "Quality education in schools," *Curric. Teach.*, 2023.
- [12] M. B. Mongillo, Y. Liu, and J. D. Visone, "How contextual factors influence teacher perceptions of teacher evaluation implementation," *Leadersh. Policy Sch.*, 2024.
- [13] A. M. Mufidah, M. Yusuf, and H. Widyastono, "The correlation between total quality management with teacher performance in special education," *J. Educ. Learn.*, 2025.
- [14] T. Nogueiro, M. Saraiva, and A. R. Pires, "Critical success factors of TQM for sustainability in higher education institutions: A theoretical contribution," in *Springer Proceedings in Business and Economics*, Springer, 2023, pp. 351–363.
- [15] Z. Kaleli, G. Konteos, G. Avlogiaris, and P. Kilintzis, "Total Quality Management as competitive advantage for the internal strategy and policy of Greek special education school units," *J. Knowl. Econ.*, 2024.
- [16] N. Kaiseroglou and E. Sfakianaki, "A review of total quality management applications in schools," *International Journal of Management in Education*, vol. 14, no. 2. 2020. doi: 10.1504/IJME.2020.105405.

- [17] B. C. Fusarelli and L. D. Fusarelli, "What do excellent school leader preparation programs look like?," *Phi Delta Kappan*, vol. 104, no. 6, pp. 36–40, 2023.
- [18] N. Kanya, A. B. Fathoni, and Z. Ramdani, "Factors affecting teacher performance," *Int. J. Eval. Res. Educ.*, vol. 10, no. 3, pp. 812–817, 2021.
- [19] I. Muttaqin, N. Tursina, A. Sudrajat, and M. E. Kurnanto, "The effect of academic supervision, managerial competence, and teacher empowerment on teacher performance: The mediating role of teacher commitment," *F1000Research*, vol. 12, p. 397, 2023.
- [20] M. W. A. Pramana, I. N. Jampel, and K. Pudjawan, "Meningkatkan Hasil Belajar Biologi Melalui E-Modul Berbasis Problem Based Learning," *J. Edutech Undiksha*, vol. 8, no. 2, p. 17, Sep. 2020, doi: 10.23887/jeu.v8i2.28921.
- [21] Sugiyono, *Metode penelitian kuantitatif, kualitatif dan R & D*. 2018.
- [22] S. Arikunto, *Prosedur penelitian: Suatu pendekatan praktik*. Jakarta: Rineka Cipta, 2010.
- [23] R. Ruliah, S. Muslim, Z. Syahrial, and A. S. Pratiwi, "Development of instructional design based on computer-assisted instruction models for database system course in information technology colleges," *Univers. J. Educ. Res.*, vol. 8, no. 1, pp. 205–213, 2020.
- [24] L. Roper, "Accreditation; IFLA education guidelines; and other practices for ensuring quality education," in *Encyclopedia of Libraries, Librarianship, and Information Science (1st ed., Vol. 1–4)*, IGI Global, 2024.
- [25] A. Olowoselu, "Educational leadership and quality assurance in schools," in *Interdisciplinary Approaches for Educators' and Learners' Well-being: Transforming Education for Sustainable Development*, 2024.
- [26] W. Mahmood, S. N. Ismail, and M. N. Omar, "Mediating role of school climate and job satisfaction in total quality management and school performance," *Malaysian J. Learn. Instr.*, 2024.
- [27] D. I. I. Putri, "Student development based on Total Quality Management in MI Al-Hidayah Bagor Miri Sragen," *Millah J. Relig. Stud.*, vol. 19, no. 2, pp. 381–408, 2020.
- [28] S. Suriagiri, A. Akrim, and N. Norhapizah, "The influence of school principal supervision, motivation, and work satisfaction on teachers' performance," *Cypriot J. Educ. Sci.*, vol. 17, no. 4, pp. 1293–1303, 2022.
- [29] H. Mugendawala and D. Muijs, "Educational process factors for effective education in resource-constrained countries: A multilevel analysis," *Sch. Eff. Sch. Improv.*, vol. 31, no. 2, pp. 211–232, 2020.
- [30] B. Lu and R. N. Hanim, "Enhancing learning experiences through interactive visual communication design in online education," *Eurasian J. Educ. Res.*, 2024.
- [31] Hendriwanto, "A reflective teaching practicum as a platform for stimulating pre-service teachers' professional development," *J. Educ. Teach.*, vol. 47, no. 3, pp. 398–410, 2021.
- [32] E. Hadiati, S. Setiyo, D. A. Setianingrum, and A. Fradito, "School management in Total Quality Management perspective at Bina Latih Karya Vocational School Bandar Lampung-Indonesia," *Educ. Adm. Theory Pract.*, 2022.
- [33] S. J. Wafudu and Y. Bin Kamin, "Quality assurance: A conceptual framework for teaching and learning standards in vocational and technical education programs," *Qual. Assur. Educ.*, 2024.
- [34] A. Pal Pandi, K. P. Paranitharan, and D. Jeyathilagar, "Implementation of IEQMS model in engineering educational institutions – A structural equation modelling approach," *Total Qual. Manag. Bus. Excell.*, vol. 29, no. 1–2, pp. 162–177, 2018.
- [35] Y. Bergstrom-Lynch, "LibGuides by design: Using instructional design principles and user-centered studies to develop best practices," *Public Serv. Q.*, vol. 15, no. 4, pp. 271–284, 2019.
- [36] S. A. Kadhim and M. F. B. Ahmad, "The role of TQM in education: An empirical investigation of preparatory schools of Iraq," *Int. J. Serv. Oper. Manag.*, vol. 38, no. 2, pp. 231–248, 2021.
- [37] R. Knight, "Pedagogical change and professional courage: Exposing the tensions of teacher professionalism," in *The Palgrave Handbook of Teacher Education Research: Volume 1*, 2, I. Menter and D. Wyse, Eds. Palgrave Macmillan, 2023, pp. 785–801.
- [38] G. Halász, "From teacher education to lifelong teacher learning and teacher innovation: The case of Hungary," in *Research, Policymaking, and Innovation: Teacher and Education Development in Belt and Road Countries*, Springer, 2023, pp. 119–136.