Computer Science and Interdisciplinary Research Journal
Volume 2, Issue 2, 2025. ISSN: 3033-1218, DOI: 10.70862/CSIR.2025.0202-15

Cloud-Based Educational Transformation: The Municipal Policy Model of Plovdiv, Bulgaria

Stefan Stoyanov

University of Plovdiv Paisii Hilendarski, 236, Bulgaria Blvd, 4027 Plovdiv, Bulgaria

stefan.stoyanov@uni-plovdiv.bg

Abstract – The article presents the process of digitalization of education in the Municipality of Plovdiv, Bulgaria, as a good practice for educational transformation. Based on a comparative analysis of international practices and the experience of the Municipality of Plovdiv, a model for the digital transformation of the school environment has been developed. The paper examines the main stages of the implementation of the "School in the Cloud" project, which includes the activation of cloud platforms, the training and certification of teachers, as well as the application of the 1:1 model. The achieved results are presented, highlighting the region as one of the leaders in Eastern Europe in implementing cloud technologies in education. The study emphasizes the importance of local policies, teacher training and professional development, as well as the need for active community engagement. The establishment of effective cooperation between local authorities, schools, and technology partners stands out as a prerequisite for the sustainable development of the educational environment in the digital era. The described strategies can serve as a model for the modernization and digitalization of municipal-level educational systems.

Keywords – cloud technologies, digital transformation, educational policy, municipal education, Google Reference School, teacher training.

DOI: https://doi.org/10.70862/CSIR.2025.0202-15

Corresponding author: Stefan Stoyanov, University of Plovdiv Paisii Hilendarski
Email: stefan.stoyanov@uni-plovdiv.bg

Received: 24 October 2025.
Revised: 6 November 2025.
Accepted: 8 November 2025.
Published: 8 November 2025.

© 2025 Stefan Stoyanov. This work is licensed under the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.

The article is published with Open Access at http://csirjournal.com/

1. Introduction

New technologies have the potential to redefine and transform educational systems, as well as the methods of teaching, learning, and assessment. Cloud computing provides a wide range of tools that enable innovation in the organization of the learning process and in the communication between participants in the educational system. Despite the significant potential of cloud technologies, their implementation at the level of individual educational institutions is associated with a number of challenges. Among these are the need for qualified teaching staff, the adaptation of curricula, the provision of appropriate resources, and the establishment of reliable infrastructure. In this context, the role of municipal policies that govern local educational systems becomes particularly important. The good practice of the Municipality of Plovdiv in developing and implementing a strategy for the adoption of cloud solutions serves as an example worthy of attention both nationally and internationally.

The study presented in this article focuses on the analysis of municipal policies in Bulgaria concerning school education and their role in promoting the implementation of innovations and technologies in teaching and learning. It examines the process through which municipalities formulate their educational strategies and the extent to which these align with national priorities for digitalization and for improving students' preparedness for the labor market. The challenges faced by schools in implementing cloud-based solutions are analyzed, along with the corresponding measures taken to overcome them. Concrete examples from the practice of the Municipality of Plovdiv illustrate the effects of these policies and their applicability at the local level. The data used for the local educational ecosystem was collected from official reports of the Plovdiv Municipality and decisions of the local parliament.

2. Modern Educational Policies

Modern educational policy can be defined as a set of principles, guidelines, and regulations that determine how education functions within a given country or region. It covers aspects such as institutional management, curriculum design, teacher qualifications, financing, and student assessment. Its primary goal is to ensure access to quality education for all students, supporting the development of their potential and their active participation in society.

The formation of educational policy depends on multiple factors, including public attitudes, economic conditions, political decisions, and global educational trends. Policy frameworks are often based on scientific and ethical principles, encompassing the right to education, equality of opportunity, and the need to develop competencies that meet the requirements of the modern labor market. In this context, municipal educational policy represents a localized application of national policy. It is developed and implemented by local authorities in accordance with the educational needs of the specific community. Municipalities manage funding, the number and type of schools, the provision of qualified teachers, and infrastructure renewal. Differences in access to resources and in the challenges faced determine the specific nature of local educational strategies.

In the 21st century, education systems worldwide face global challenges – foremost among them the rapid technological progress transforming how knowledge is delivered and acquired. Institutions must adapt teaching and assessment methods while emphasizing digital literacy [1–4]. This trend became particularly evident during the pandemic, which led to the widespread adoption of distance learning [5,6].

On the other hand, demographic changes and migration flows have a direct impact on the composition of student populations, creating challenges for the integration of children from diverse cultural and linguistic backgrounds. This necessitates innovation in pedagogical approaches and the application of personalized learning in order to address the growing diversity of educational needs. In this process, digital technologies play a key role. The integration of artificial intelligence, virtual reality, and augmented reality offers new opportunities to enrich the learning process, making it more engaging and adaptable to the individual needs of students.

Despite these promising prospects, funding remains one of the most serious challenges facing educational systems. Insufficient budgeting in most municipalities and the need for larger national funds limit the opportunities for modernizing infrastructure and for providing the necessary qualification of teaching staff capable of implementing innovative practices.

Another critical aspect is the deficit in systems for assessing and monitoring educational outcomes. Existing standards often fail to adequately reflect students' actual skills and knowledge, as well as the achievements of teachers and schools when considered within the context of their specific conditions and available resources.

The sustainability of educational systems largely depends on the professional preparation and development of teachers. In an era when continuous learning is essential, it is important that teachers receive adequate training and opportunities for professional growth, enabling them to respond effectively to rapidly changing working conditions [7].

Modern global competition imposes even higher demands on education. It must prepare not only competent professionals but also innovators capable of critical thinking and creativity. This determines the need for curricular reforms that emphasize digitalization and the development of "soft" skills such as problem-solving, critical analysis, and creative thinking. The application of educational technologies aligned with the realities of the digital world is one of the key approaches to successfully addressing the challenges of the 21st century [8].

A comparative analysis of educational policies in Bulgaria – and particularly in Plovdiv – with practices from other educational systems shows that there are numerous models that can be adapted to the national and local context. As part of the global educational environment, Bulgarian schools need to align their strategies to meet contemporary challenges and take advantage of the opportunities offered by new technologies and teaching methods.

Some key findings from the conducted analysis are as follows:

- Bulgarian schools can adopt successful practices from the United States and the Scandinavian countries, where emphasis is placed on the individualization and diversity of curricula. This can be achieved through the integration of modern technological solutions, including cloud technologies [9-11].
- Singapore and South Korea provide examples of systems with high academic standards and excellent performance on international educational assessments. Despite their traditionally rigorous approach, in recent years they have also focused on pedagogical innovation and technological integration, which foster students' creativity and critical thinking alongside knowledge retention [12,13].

- Many countries are developing programs for inclusive education and the integration of students from vulnerable social groups. Successful practices in the United Kingdom and Germany can be used to enhance Bulgarian policies by building stronger support systems, often based on digital solutions [14,15].
- The experience of the United Kingdom and Finland demonstrates that the successful implementation of educational policies requires the active involvement of local authorities, parents, businesses, and non-governmental organizations. Such collaboration improves the quality of education by providing additional resources and expert support [16,17].
- Teacher support and professional training are key factors for successful digital transformation. In this context, the example of Finland, where the emphasis is placed on systematic teacher training and qualification, is particularly illustrative and can serve as a model for Bulgarian municipalities [18].

The findings are summarized in Table 1.

Table 1. International Good Practices and Their Applicability to Bulgaria and the Municipality of Plovdiv.

Country / Region	**Key Practices**	**Potential Applicability for Bulgaria / Plovdiv**
United States, Scandinavian countries	Individualization and diversity in curricula.	Introduction of personalized learning through cloud technologies and digital resources.
Singapore, South Korea	High academic standards combined with technological innovation.	Development of creativity and critical thinking through the integration of traditional knowledge and new technologies.
United Kingdom, Germany	Inclusive education and integration of vulnerable groups.	Building a stronger support system through digital tools and cloud-based solutions.
United Kingdom, Finland	Active involvement of the community (local authorities, parents, business, NGOs).	Improving quality through partnerships and the mobilization of local resources.
Finland	Support and systematic teacher training.	Qualification for the use of new technologies and sustainable implementation of digitalization.

The educational policy of the Municipality of Plovdiv is undergoing a stage of renewal in which the implementation of innovations and technological solutions has become a necessity. With the adoption of the new educational strategy, the program for the digitalization of the learning process was launched in 2015. A comparison with global models indicates that digital transformation serves as a key mechanism for modernization and for improving the quality of education at both the local and national levels.

3. Policy of the Municipality of Plovdiv for the Implementation of Cloud Technologies in School Organizations

The Municipality of Plovdiv is the first institution in Bulgaria to develop and implement an independent digitalization policy that provides all municipal schools and kindergartens with an activated cloud platform accessible through their own domain. This achievement is the result of targeted efforts and a consistent strategy implemented over several years.

The process of digital transformation in education began in 2015 as a policy initiative of the Municipality of Plovdiv, in partnership with the city's schools and technological partners. The process can be divided into three main stages:

1. Providing access to cloud-based learning platforms;
2. Training of municipal experts and school teams in working with cloud platforms;
3. Implementing cloud technologies as a means of transforming the learning process.

The first stage (Figure 1) began in 2016, when the team of the Department of Education at the Municipality of Plovdiv identified an opportunity for reform aimed at the digitalization of school education. The initiative was motivated by the fact that the cloud services provided by technology companies Google and Microsoft had already been fully translated into Bulgarian, made publicly accessible, and supported a wide range of educational applications. These tools enabled both the digitalization of administrative processes in schools and their integration into the learning process, with the aim of enhancing digital literacy and modernizing teaching methods.

The main advantages that cloud technologies offer in education include:

- facilitated access to diverse educational resources and tools, regardless of the location of students and teachers;
- improved collaboration and real-time communication;
- optimization of time and organization of the learning process;
- reduction of administrative and financial costs;

- opportunity for storing, sharing, and analyzing large volumes of data [19-22].

In collaboration with the official partners of both companies, the Municipality of Plovdiv provided schools with the opportunity to choose between the two platforms. As a result, 50 schools implemented Google Workspace for Education (then known as Google G Suite), while two schools opted for Microsoft 365 Education.

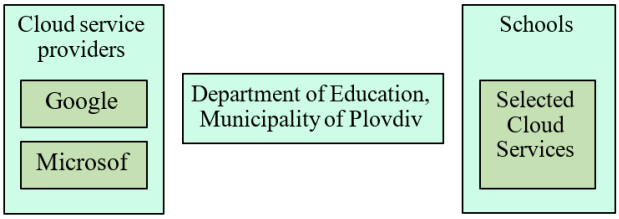


Figure 1. Access to Cloud-Based Learning Platforms.

The positive results achieved during the first stage gave both the Municipality of Plovdiv and the school teams confidence in the significance of the undertaken initiative. This led to the decision to expand the project and implement the following two stages.

The second stage (Figure 2), covering 2017, focused on establishing a sustainable mechanism to support schools in using the selected cloud platforms. A practice was introduced whereby all administrative communications between the municipality and educational institutions were conducted through official cloud-based email accounts. This measure ensured data security, centralized information management, and compliance with the General Data Protection Regulation (GDPR) requirements.

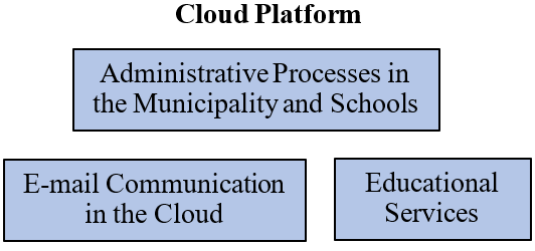


Figure 2. Introduction and Training for Working with Cloud Platforms.

To ensure the high quality of implementation of the planned policies, the team from the Department of Education was the first to undergo specialized training for working with cloud systems. During this stage, the "School in the Cloud" project [23] was launched, including the development of a strategic framework and educational programs aimed at financing and supporting schools on their path toward digital transformation.

As a result, numerous training sessions were conducted for school teams, enabling them to acquire practical skills for working with cloud platforms. This facilitated the digitalization of various administrative processes and significantly improved internal school communication.

The third stage (Figure 3) began once schools had the necessary infrastructure and trained staff, marking the start of the actual integration of cloud platforms into educational practice.

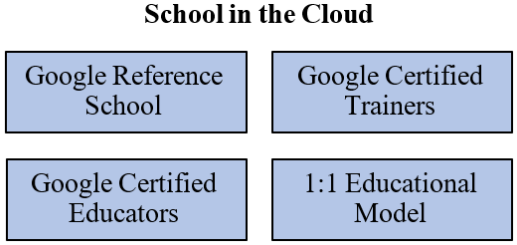


Figure 3. Elements of the Integrated "School in the Cloud" Ecosystem of the Municipality of Plovdiv.

A significant number of teachers completed certification programs under Google for Education, gaining internationally recognized competencies for working in a digital learning environment. These efforts created the foundation for introducing the innovative 1:1 educational model, which provides personal devices for all students and teachers, to be used both in the classroom and during distance learning [24,25].

The high level of engagement and the sustainability of the achieved results led to international recognition for a number of Plovdiv schools. Among them are Ivan Vazov Language High School, Chernorizets Hrabar Secondary School, Saints Cyril and Methodius Secondary School, Hristo G. Danov Secondary School, Vocational School of Food Technology and Engineering, Yane Sandanski Primary School, and Exarch Antim I Primary School, all of which received the status of Google Reference School.

In a parallel project implemented with the support of the Municipality of Plovdiv, teachers were certified under the international Google for Education programs (Google Certified Educator – Level 1 and Level 2) [26, 27].

To support this process, the Municipality of Plovdiv established two new programs – "Digitalization of the Learning Process" and "Modernization of the Learning Process" – through which schools were assisted in implementing cloud platforms and upgrading hardware during the period 2017–2019. These programs provided targeted funding for:

- initial activation and configuration of the cloud platform within the school's domain;
- training of teachers, principals, and administrators;
- purchase of devices and additional equipment, co-financed at 50–70% of the total cost.

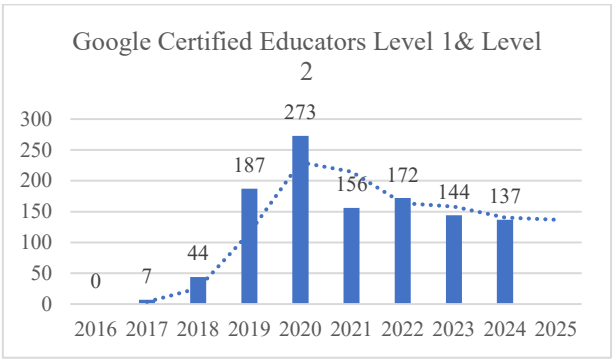
4. Results

The key results from the implementation of the education digitalization projects in the Municipality of Plovdiv are summarized in Table 2:

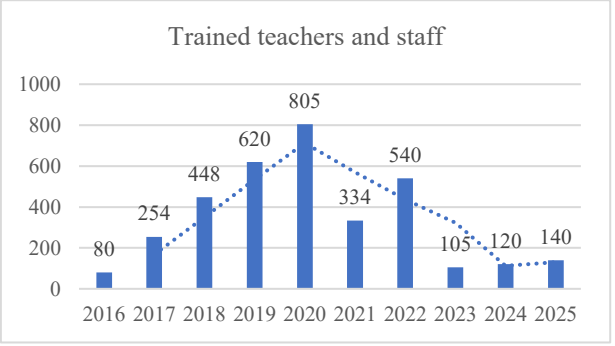
- By 2019, three years after the launch of the "School in the Cloud" project, 52 municipal and 4 state and private schools, as well as the Department of Education of the Municipality of Plovdiv, had fully functioning cloud platforms [28].
- Each year, numerous teachers and administrators participate in training programs.
- The number of Google Certified Trainers increased from 2 in 2019 to 7 in 2020.

Table 2. Dynamics of Cloud Technology Implementation and the Related Educational Transformation in the Municipality of Plovdiv (2016–2025).

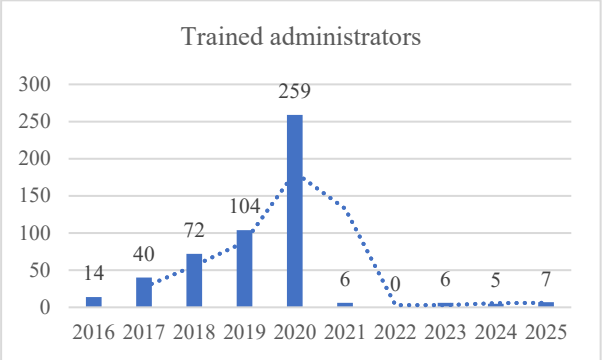
Indicator \ Year	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Schools with active cloud services	7	20	52	52	52	52	52	52	52	52
Trained teachers and staff	80	254	448	620	805	334	540	105	120	140
Trained administrators	14	40	72	104	259	6	10	6	5	7
Google Certified Educators (Level 1 & Level 2)		7	44	187	273	156	172	144	137	
Google Certified Trainers				2	7	1	2			
Classes under the 1:1 model			1	6	21	22	38	94	95	69
Google Reference Schools				1		5	1			



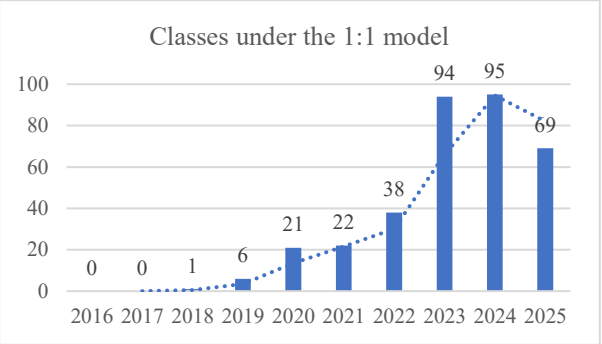
(a)



(b)



(c)



(d)

Figure 4. Trends for: **(a)** Google Certified Educators Level 1& Level 2; **(b)** Trained teachers and staff; **(c)** Trained administrators; **(d)** Classes under the 1:1 model.

Trends for certified educators, administrators, trained teachers and staff, as well as for classes under the 1:1 model are presented in Figure 4.

Particular attention should be paid to several key achievements related to the implementation of educational digital transformation policies in the Municipality of Plovdiv:

- The adoption of the 1:1 educational model in a significant number of schools, ensuring equal access to digital devices and creating conditions for personalized learning;
- The certification of seven schools as Google Reference Schools, a recognition that confirms the high level of integration of cloud technologies and pedagogical innovations;
- The establishment of the first officially recognized independent community of teachers in Bulgaria – GEG Plovdiv (Google Educators' Group), which functions as a platform for mutual assistance, technological collaboration, and methodological support among educators.

4.1. The 1:1 Educational Model

Plovdiv has established itself as a national leader in Bulgaria, with the highest number of teachers certified under the international Google for Education programs – a total of 273 educators by 2020. This achievement represents a natural foundation for the next phase of digital transformation – the preparation

of Google Certified Trainers and the implementation of the 1:1 educational model.

Under this model, students and teachers:

- have personal laptops and constant internet access;
- learn, collaborate, and communicate in teams both inside and outside the classroom;
- create their own digital products, applying knowledge and skills from various subjects;
- use screen time meaningfully and productively, mastering modern digital tools;
- work in a safe physical and online environment;
- plan learning activities collaboratively [25,29].

The 1:1 educational model is an established approach in numerous innovative schools worldwide – in the Netherlands, Finland, Sweden, and other countries. In these nations, hundreds of municipalities already apply it as a standard component of their educational systems. Such systems traditionally occupy leading positions in rankings of digital skills, public-sector innovation, and technological business development, while their students demonstrate high levels of functional literacy [30-32].

According to data from the Department of Education of the Municipality of Plovdiv, during the 2022/2023 school year, education under the 1:1 model was implemented in 17 schools, encompassing a total of 79 classes, once again placing Plovdiv in a leading position nationwide in the application of this approach.

4.2. Google Reference Schools

By mid-2022, there were 16 Google Reference Schools operating in Bulgaria – the only ones of this type in Central and Eastern Europe. Of these, seven are located within the city of Plovdiv, which represents a remarkable achievement and a direct result of the municipality's consistent and strategic local policy for the digitalization of education.

Google Reference Schools are institutions recognized by Google for their outstanding use of technology to promote positive learning outcomes. Schools holding this status commit to sharing their experiences and best practices, welcoming visitors, and hosting training sessions and educational events [33].

4.3. Google Educators' Group Plovdiv

In Plovdiv, the first independent teacher community in Bulgaria officially recognized by Google was established, aimed at mutual support and both technological and methodological assistance. The Google Educators' Group (GEG Plovdiv) was created by teachers, for teachers and operates on the principles of voluntarism and open access. Membership is free and voluntary, with the primary goal of collaboratively exploring new approaches to organizing the learning process through digital technologies, as well as actively sharing accumulated experience.

The community's activities include monthly methodological meetings, training events, and seminars dedicated to pedagogical innovation and the practical application of cloud technologies in education.

5. Conclusion

The use of modern technologies has become an integral part of improving the quality of education. The integration of cloud technologies into the school system of the Municipality of Plovdiv has provided new opportunities for learning, collaboration, and the development of digital competences among students and teachers. Within a few years, a comprehensive model was built, combining technological infrastructure, qualified human resources, and strategic management. The process of implementing cloud technologies followed clearly defined stages – ensuring access to platforms, training pedagogical and administrative staff, and transforming the learning process through integrated digital tools.

The achieved results – certified teachers, the implementation of the 1:1 educational model, the establishment of Google Reference Schools, and the active professional community GEG Plovdiv – demonstrate the high degree of sustainability of the model. It is important to emphasize that, thanks to the digitalization policies and measures undertaken four years before the COVID-19 pandemic, the schools in Plovdiv were already prepared for the transition to distance learning and succeeded in ensuring the continuity of the educational process.

Today, education faces new horizons and challenges associated with the emergence of GenAI tools – a natural continuation of the evolution of artificial intelligence and cloud technologies. The easy access to these tools carries both enormous potential and certain risks: they can enhance creativity and analytical thinking but may also reduce independent reasoning and depth of understanding if not used consciously and ethically. Enhancing knowledge and skills for working with GenAI tools is the next strategic step that the educational community must undertake. It is necessary to develop timely policies and training programs focused on the qualitative and ethical use of artificial intelligence. The open but probabilistic nature of AI-generated knowledge requires learners to demonstrate higher levels of critical thinking, analytical ability, and self-directed learning and creativity, in collaboration with intelligent technologies [34-38].

Acknowledgements

The author expresses sincere gratitude to the project "Digital Sustainable Ecosystems – Technological Solutions and Social Models for Ecosystem Sustainability (DUECOS), BG-RRP-2.004-0001-C01", implemented within the framework of the Research Center for Innovation in Education and SMART Technologies in Learning, funded by the European Union – NextGenerationEU through the National Recovery and Resilience Plan of the Republic of Bulgaria.

References

[1] OECD. (2023). *Future of Education and Skills 2030/2040.* Organisation for Economic Co-operation and Development. https://www.oecd.org/en/about/projects/future-of-education-and-skills-2030.html

[2] van der Vlies, R. (2020). *Digital strategies in education across OECD countries: Exploring education policies on digital technologies* (OECD Education Working Papers No. 226). OECD Publishing. https://doi.org/10.1787/33dd4c26-en

[3] Timotheou, S., Miliou, O., Dimitriadis, Y., Sobrino, S. V., Giannoutsou, N., Cachia, R., ... & Ioannou, A. (2023). Impacts of digital technologies on education and factors influencing schools' digital capacity and transformation: A literature review. *Education and Information Technologies, 28*(6), 6695–6726. https://doi.org/10.1007/s10639-022-11431-8

[4] Qayyum, A. (2022). Assessing the digital transformation of education systems: An international comparison. In *Handbook of open, distance and digital education* (pp. 1–18). Springer Nature Singapore. https://doi.org/10.1007/978-981-19-2080-6_14

[5] Bozkurt, A., Jung, I., Xiao, J., Vladimirschi, V., Schuwer, R., Egorov, G., ... & Paskevicius, M. (2020). A global outlook to the interruption of education due to COVID-19 pandemic: Navigating in a time of uncertainty and crisis. *Asian Journal of Distance Education, 15*(1), 1–126. https://www.asianjde.com/ojs/index.php/AsianJDE/article/view/462

[6] Antoninis, M., Alcott, B., Al Hadheri, S., April, D., Fouad Barakat, B., Barrios Rivera, M., ... & Weill, E. (2023). *Global education monitoring report 2023: Technology in education: A tool on whose terms?* UNESCO. https://doi.org/10.54676/UZQV8501

[7] Vitanova, N. (2019). Education of the future. *Pedagogy, 91*(8), 1057–1090.

[8] Fullan, M. (2015). A New Culture of Learning: Cultivating the Imagination for a World of Constant Change. *Studies in Art Education, 56*(3), 281–283. https://doi.org/10.1080/00393541.2015.11518969

[9] Pane, J. F., Steiner, E. D., Baird, M. D., Hamilton, L. S., & Pane, J. D. (2017). *Informing progress: Insights on personalized learning implementation and effects.* RAND Corporation. https://www.rand.org/pubs/research_reports/RR2042.html

[10] Lee, D., Huh, Y., Lin, C. Y., & Reigeluth, C. M. (2022). Personalized learning practice in US learner-centered schools. *Contemporary Educational Technology, 14*(4), Article ep385. https://doi.org/10.30935/cedtech/12330

[11] Håkansson Lindqvist, M. (2021). The use of digital technologies in a 1:1 laptop initiative: The parent perspective. *Seminar.net: Media, Technology and Lifelong Learning, 17*(1), 1–28. https://doi.org/10.7577/seminar.3582

[12] Tan, C., & Ng, C. S. (2021). Cultivating creativity in a high-performing education system: The example of Singapore. *Journal of Curriculum and Pedagogy, 18*(3), 253–272. https://doi.org/10.1080/15505170.2020.1808126

[13] Chae, Y. (2021). The creativity and character in Korea teacher education. *Contemporary Educational Researches Journal, 11*(1), 1–8. https://doi.org/10.18844/cerj.v11i1.4728

[14] Goodley, D., Cameron, D., Liddiard, K., Parry, B., Runswick-Cole, K., Whitburn, B., & Wong, M. E. (2020). Rebooting inclusive education? New technologies and disabled people. *Canadian Journal of Disability Studies, 9*(5), 515–549. https://doi.org/10.15353/cjds.v9i5.707

[15] Knigge, M., & Kollosche, D. (2019). Inclusive education in German schools. In D. Kollosche, R. Marcone, M. Knigge, M. G. Penteado, & O. Skovsmose (Eds.), *Inclusive mathematics education* (pp. 35–47). Springer. https://doi.org/10.1007/978-3-030-11518-0_3

[16] Kiesi, I. (2023). Co-operation of edu-business and public schooling: Is the governance of education in Finland shifting from the public sector to networks? In M. Thrupp, P. Seppänen, J. Kauko, & S. Kosunen (Eds.), *Finland's famous education system: Unvarnished insights into Finnish schooling* (pp. 155–172). Springer Nature Singapore. https://doi.org/10.1007/978-981-19-8241-5_10

[17] Greany, T. (2022). Place-based governance and leadership in decentralised school systems: Evidence from England. *Journal of Education Policy, 37*(2), 247–268. https://doi.org/10.1080/02680939.2020.1792554

[18] Byman, R., Jyrhämä, R., Stenberg, K., Maaranen, K., Sintonen, S., & Kynäslahti, H. (2021). Finnish teacher educators' preferences for their professional development: Quantitative exploration. *European Journal of Teacher Education, 44*(4), 432–451. https://doi.org/10.1080/02619768.2020.1793952

[19] Wang, L. Y. K. (2024). Evaluating the impact of cloud e-learning in higher education: An empirical investigation. *Knowledge Management & E-Learning, 16*(2), 286–308. https://doi.org/10.34105/j.kmel.2024.16.014

[20] Sharma, M., Vadalkar, S., Singh, A., Chavan, G., & Tsagarakis, K. P. (2025). How Does Cloud Computing Adoption Accelerate Education? – Enhancing Academic Results by Integrating Knowledge

Management Pre and Post Pandemic. *International Journal of Human–Computer Interaction, 41*(17), 11095–11115. https://doi.org/10.1080/10447318.2024.2440673

[21] Yurchenko, A., Rozumenko, A., Rozumenko, A., Momot, R., & Semenikhina, O. (2023). Cloud technologies in education: The bibliographic review. *Informatyka, Automatyka, Pomiary w Gospodarce i Ochronie Środowiska, 13*(4), 79–84. https://doi.org/10.35784/iapgos.4421

[22] Thavi, R., Jhaveri, R., Narwane, V., Gardas, B., & Jafari Navimipour, N. (2024). Role of cloud computing technology in the education sector. *Journal of Engineering, Design and Technology, 22*(1), 182–213. https://doi.org/10.1108/JEDT-08-2021-0417

[23] Municipality of Plovdiv. (n.d.). *Specialized website "Schools in the Cloud"*. https://cloud.plovdiv.bg/

[24] Learning 1:1 Bulgaria. (n.d.). *Project portal "1:1" in Bulgaria.* https://learning1to1.bg/

[25] Hall, C., & Lundin, M. (2024). Technology in the classroom: Personal computers and learning outcomes in primary school. *Economics of Education Review, 100,* Article 102536. https://doi.org/10.1016/j.econedurev.2024.102536

[26] Google for Education. (n.d.). *Fundamentals training.* https://edu.exceedlms.com/student/path/1716233

[27] Anis, M. (2024). Teacher professional development in the digital age: Addressing the evolving needs post-COVID. *International Journal for Multidisciplinary Research, 6*(1), 1–14. https://doi.org/10.4018/979-8-3373-1692-5.ch005

[28] Angelov, A. (2020). Overview of activators and activities related to integration of Google G Suite for Education in Plovdiv Municipality schools. *Education and Development, 5,* 1–12. ISSN 2603-3577.

[29] Tsokov, G., Angelov, A., Georgieva, M., Hristov, S., & Dolapchieva, S. (2020). *Digital leap in Bulgarian schools – The "One-to-One (1:1)" model.* eISBN 978-619-91278-8-9.

[30] Zheng, B., Warschauer, M., Lin, C., & Chang, C. (2016). Learning in One-to-One Laptop Environments: A Meta-Analysis and Research Synthesis. *Review of Educational Research, 86*(4), 1052–1084. https://doi.org/10.3102/0034654316628645

[31] Bergström, P., & Wiklund-Engblom, A. (2022). Who's got the power? Unpacking three typologies of teacher practice in one-to-one computing classrooms in Finland. *Computers & Education, 178,* Article 104396. https://doi.org/10.1016/j.compedu.2021.104396

[32] Cameron, D. L., Herlofsen, C., Jensen, C. R., Lindqvist, G., Molbæk, M., Ström, K., & Sundqvist, C. (2024). The special education profession in four Nordic countries in light of evolving policies on inclusion and special needs education. *European Journal of Special Needs Education, 39*(6), 849–865. https://doi.org/10.1080/08856257.2024.2425500

[33] Google for Education. (n.d.). *Official education directory.* https://edudirectory.withgoogle.com/

[34] Taguma, M., & Frid, A. (2024). Curriculum frameworks and visualizations beyond national frameworks: Alignment with the OECD learning compass 2030 (OECD Education Working Papers No. 314). OECD Publishing. https://doi.org/10.1787/2a4bdce6-en

[35] OECD. (2025). *OECD teaching compass: Reimagining teachers as agents of curriculum changes* (OECD Education Policy Perspectives No. 123). OECD Publishing. https://doi.org/10.1787/8297a24a-en

[36] Boeskens, L., & Meyer, K. (2025). Policies for the digital transformation of school education: Evidence from the Policy Survey on School Education in the Digital Age (OECD Education Working Papers No. 328). OECD Publishing. https://doi.org/10.1787/464dab4d-en

[37] Nemorin, S., Vlachidis, A., Ayerakwa, H. M., & Andriotis, P. (2023). AI hyped? A horizon scan of discourse on artificial intelligence in education (AIED) and development. *Learning, Media and Technology, 48*(1), 38–51. https://doi.org/10.1080/17439884.2022.2095568

[38] Liu, R., Zenke, C., Liu, C., Holmes, A., Thornton, P., & Malan, D. J. (2024, March). Teaching CS50 with AI: Leveraging generative artificial intelligence in computer science education. In *Proceedings of the 55th ACM Technical Symposium on Computer Science Education* (Vol. 1, pp. 750–756). ACM. https://doi.org/10.1145/3626252.3630938