

Future Competencies for Preparing Educational Supervisors to Supervise Teachers of Students with Intellectual Disabilities in the Context of Digital Transformation: A Foresight Study

Marwan Alatawi

*Associate Professor, Department of Special Education, Collage of Education and Art,
University of Tabuk, Saudi Arabia*

Email: Mralatawi@ut.edu.sa

Abstract

Over the last years, the education system has changed more and more due to the fast technological development. The ways of teaching future teachers how to deal with students who have an intellectual disability have changed as well. This study aims to elaborate future competencies that educational supervisors need to acquire in order to deal with the digital change. This study was conducted by means of foresight in the form of a Delphi study. By this type of study expert consensus was searched in order to anticipate future needed competencies for supervising in the future. Future competencies for educational supervisors to be trained in the context of digitalization were identified in five main fields: Future Digital Competencies, Future Leadership Competencies, Future Professional and Ethical Competencies as well as Future Research and Innovation Competencies. The Future Digital Competencies for the Digital Education Context, especially with regard to AI, data literacy and digital leadership, reached the highest scores. Based on these results a new competency framework for training and developing educational supervisors for future supervisions in inclusive digital education in regular schools as well as in special education schools and centers for children and adolescents with intellectual disability can be developed.

The proposed competency framework could be used by universities and by education policy makers to support the preparation and development of educational supervisors for future-oriented, inclusive and technology-enhanced education of people with disabilities.

Keywords: Educational supervision; Digital transformation; Educational supervisors; Intellectual disabilities; Delphi method

1. Introduction

Technological innovations have spurred changes in educational systems around the world, leading to a revolution in teaching, learning, assessment, and educational management processes. The involvement of artificial intelligence (AI), learning analytics, cloud computing, and digital learning platforms in education has created opportunities for innovations, personalized learning, and data-based decision making while increasing the qualifications of educators (Rawis & Sumilat, 2025; Nazyrova et al., 2025).

Educational supervisors have been given new responsibilities that help in enhancing teaching practice. Their role now stands beyond monitoring and evaluation and involves instructional leadership, coaching, mentoring, digital technology integration, and educational reform (Sumampow & Tudus, 2025; Gonçalves da Silva, 2025). This is especially vital for special education since supervising teachers of students with intellectual disabilities involves applying principles of inclusive education, individual instruction, assistive technologies, and evidence-based teaching practice (Prasongmanee et al., 2021; Zanten et al., 2025).

Hence, despite the significant potential of digital transformation, new challenges arise for educational supervisors, who must support teachers in their ethical use of technology, data security, digital facilitation, and ongoing professional development. Therefore, in order to accomplish effective supervision, a proper blend of technological, leadership, professional, ethical, and research capabilities should be implemented (Assanova & Sarzhanova, 2024; Mei et al., 2023).

Nonetheless, their importance continues to be ignored in research, especially concerning educational supervisors who supervise the teaching process of students with intellectual disabilities. Moreover, not many studies have been conducted from the perspective of foresight in order to find the needed competencies as educational technologies advance (Hamzah et al., 2025; Joseph et al., 2024). This gap makes it hard for

educational institutions and decision-makers to prepare educational supervisors for future educational settings.

To fill this gap, the authors of the present research conduct a foresight study via the Delphi method identifying future competencies of educational supervisors in light of digital transformation. More specifically, the research sets the following goals: to identify the most important competencies, set their priorities and develop a comprehensive competency framework.

The research is based on the following questions:

1. What competencies will educational supervisors need in order to effectively lead teachers of children with intellectual disabilities in conditions of digital transformation?
2. What competency areas need to be emphasized in the preparation of future educational supervisors?
3. How can these competencies be integrated into a coherent structure?

The research contributes to the existing literature by blending together educational supervision and special education, as well as digital transformation and foresight research in order to build the competency framework for the future. The results of this study can be useful to universities, governments, educational agencies, and professional development providers who need to make a greater emphasis on the preparation of supervisors and further develop the education process in more innovative ways.

2. Literature review

2.1 Educational Supervision in Special Education

Educational supervision is an essential principle of enhancing educational quality, as it aims to assist teachers, facilitate instruction and improve student learning. Currently, educational supervision entails more than just inspection, emphasizing collaboration, mentoring and continuous development of instruction (Sumampow & Tudus, 2025). Consequently, as mentors and supporters of the teachers' development and innovation, the educational supervisors are expected to take on the role of instructional leaders (Gonçalves da Silva, 2025). The educational supervisors are responsible for assuring the implementation of curriculum standards, supervising the quality of instruction, giving feedback and facilitating teachers' professional development (Prasongmanee et al., 2021). With the continuing changing nature of each educational system, educational supervisors are soon to take the lead in change within the educational system, while assuring incorporation of new technologies into the teaching process (Astuti et al., 2024). This indicates the increasing significance of educational supervision in terms of instruction, coaching, and mentoring rather than only evaluation from an administrative perspective (Marcelino, 2022).

In special education, educational supervision is of great importance, as teachers educating the students with intellectual disabilities need special instruction. Educational supervisors should be familiar with inclusive education, individualized educational program development, differentiated instruction, and evidence-based intervention methods and techniques while offering continuous support to enhance teachers' performance and improve students' achievements (Zanten et al., 2025).

In addition, the rapid development of digital technologies has brought more responsibilities to educational supervisors, who have to perform not only the traditional supervisory functions but also employ new technologies, support technological innovation in the teaching and learning process, and introduce evidence-based teaching practices.

2.2 Digital Transformation in Education

Digital transformation has emerged as one of the major trends impacting modern education. It encompasses more than just technological changes; it relates to new approaches to teaching, learning, educational management, and organization. Educational institutions apply technology to improve educational results, increase their effectiveness, and develop more inclusive and student-oriented environments (Rawis & Sumilat, 2025). In this regard, educational leaders and administrators are expected to lead and implement digital transformation projects.

The development of such cutting-edge technologies as artificial intelligence, cloud computing, learning management systems, learning analytics, and assistive technologies has facilitated educational digital transformation. These technologies enable personalized learning, data-driven decision-making, and effective teaching, but at the same time, they require educational managers to acquire new competencies in technology management (Nazyrova et al., 2025). Among these technologies, artificial intelligence (AI) has the highest potential for improving education by enhancing educational processes as well as performing administrative duties and supporting the decision-making process. Nonetheless, the implementation of AI in education raises some challenges with regard to ethics, data protection, and responsible technology use, which means that establishing AI literacy is particularly important for educational managers and leaders (Assanova & Sarzhanova, 2024).

Successful digital transformation goes beyond the mere use of technology because it requires effective educational leadership. The leaders must provide efficient training, develop a strategic plan for technology integration, and support teachers (Domínguez-González et al., 2025). Digital leadership entails the proper planning of technology use in education to achieve positive results. Educational supervisors have a crucial role to play, from assisting teachers in implementing digital technologies to staying current with the rapid changes in education (Mei et al., 2023).

The widespread deployment of digital technologies has changed the requirements set on educational supervisors. They no longer only evaluate the quality of teaching. Instead, they are now expected to lead digital transformation efforts and ensure that digital technologies help improve education. This is essential for understanding what competencies should be required from educational supervisors today.

2.3 Future Competencies for Educational Supervisors

The swift changes undergone by educational pathways has brought about the necessity to redefine the competencies that are essential for educational supervisors. The also traditional competencies are chief among those that concern education supervisors in terms of educational provision. However, those that mainly focused on instruction workers supervision and management roles, have now fallen short of what is needed within the new educational field. Instead, those supervising educational courses must meet the requirements such as technological competencies and experience, strategic leadership, ability to make ethical decisions, collaborate professionally, and obtain knowledge throughout their careers (Hamzah et al. 2025; Wang 2025). According to future competencies, they are defined as combinations of the knowledge, skills, attitudes, and abilities used by specialists in order to professionally adapt to new educational situation. In particular, in terms of educational management, much attention must be paid to adaptability, new ideas generation, critical thinking in addition to good skills in the sphere of digital literacy and organizational changes lead and provision of the educational processes of high quality (Rego et al. 2023; Kormakova et al 2021). Therefore, it follows that the process of education overseeing forms competence of supervisors which surpasses a simple management as they need to master strategic leadership, digital expertise, ethical decision-making, research-informed practice, and the ability to lead continuous educational improvement in rapidly evolving learning environments.

The rise of digital transformation has stressed the need for specific digital competencies such as artificial intelligence literacy, educational data analysis, digital resource evaluation, technology integration, and ethical considerations of technologies (Kurmanov et al., 2024; Joseph et al., 2024). In addition to these competencies, supervisors need to possess a professional and ethical set of skills and research capabilities that will empower them to mentor teachers, contribute to teachers' and their own professional development, make educational decisions through equity lens, and implement evidence-based practices and adapt to multitude of changes in education (Rahyasih et al., 2024; Martinez et al., 2025).

To anticipate these related expectations, various competency frameworks have been devised which combine various domains of professional expertise and help develop supervisor training and competency evaluation (Zizikova et al., 2023). Accordingly, the present study utilizes an integrative framework that includes 5 main types of competencies: Future Digital Competencies, Future Leadership Competencies, Future Professional Competencies, Future Ethical Competencies, and Future Research and Innovation Competencies.

2.4 Foresight Studies and the Delphi Method

Foresight studies have revolutionized the study of the emerging tendencies and the support of strategic planning in education sector. Instead of forecasting the future, the aim of foresight is to highlight the plausible scenarios and find out the competences and methods to cope with the challenges of modern education (M. & Valanteena, 2022). Since the digital transformation is at its peak, the significance of foresight in preparing leaders and institutions for the upcoming changes is increasing. In education, foresight is valuable in determining necessary competences for the future, evaluating new technologies, and providing opinion on the changes to educational policies and curriculums (Najmudin et al., 2025). Foresight is of great importance for educational supervision as it helps to determine the role of technological innovations in the process of supervision.

Among the various methods for generating foresight, the Delphi technique is one of the most popular for gaining consensus among experts over complex issues. This technique allows for both the accuracy of expert opinions to be increased and groupthink to be avoided thanks to the iterative process it employs where the experts respond to a number of sequential questionnaires anonymously (Hamzah et al., 2025). The technique has frequently been used in determining the leadership-related competencies, development of frameworks for professional practices, and creation of competency models (Joseph et al., 2024).

Using Delphi foresight method seems appropriate in this case, as the required competencies of educational supervisors are continually changing due to the development of digital technologies, AI, and

inclusive education. Since there are few competency models available for the supervisors of students with intellectual disabilities, the Delphi methodology makes a scientifically justified basis for developing a competency framework for the future.

2.5 Conceptual Framework of the Study

A thorough examination of the existing body of knowledge on educational supervision shows its tendency to change in accordance with the demands of the digitalization processes and new approaches to teaching. The modern educational supervisors (this term is used in this article to refer to people working in the role of an educational supervisor as well as the teacher-educational supervisor) need to possess new skills which surpass the conventional educational supervisor abilities. The new competencies are represented by digital leader, instructional improver, inclusive educator, ethical decider and continuous learner elements.

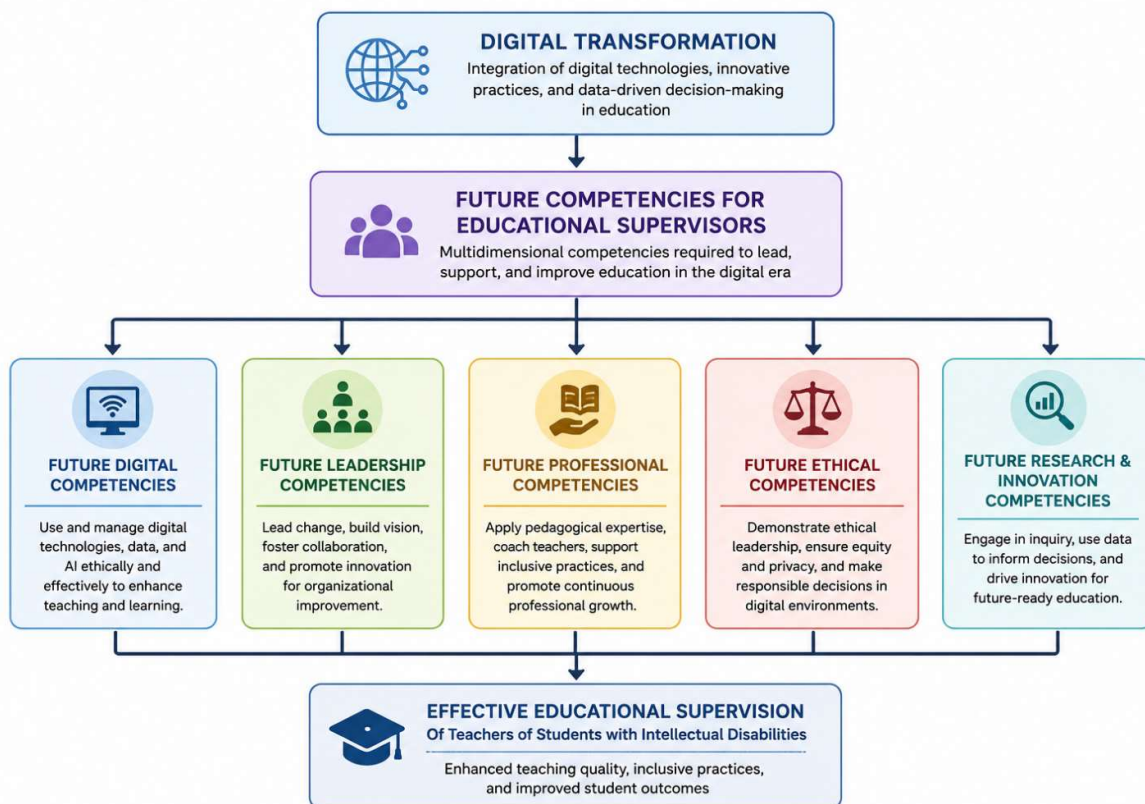
The literature also demonstrates that the new competencies are to be built through a multidimensional model working on the principle of integration of the areas of competencies like digital, leadership, professional, ethical and research areas.

This gives the base for the implementation of the concept of a new competency framework of the educational leaders which would include five areas of competency that are closely connected with each other: the Future Digital Competencies, the Future Leadership Competencies, the Future Professional Competencies, the Future Ethical Competencies and the Future Research and Innovation Competencies. In short, each of these area elements is important for the development of educational supervisors as it contributes to effective future supervisory practice.

Figure

1:

Conceptual Framework of the Study.



The conceptual framework was used as the theoretical basis for developing the Delphi questionnaire as well as for organizing the competency areas examined in the current study. It also informed the analysis and interpretation of the responses provided by the expert panel, paving the way to the creation of the future competence framework as described in the Results section of the paper. The integration of findings from educational supervision, digital transformation, competency-based learning, and foresight studies renders the framework a systematic tool for studying the competences necessary for educational supervisors working in the field of rapidly changing educational environment.

3. Methodology

3.1 Research Design

The outlined research employed foresight research method for defining and ranking future supervisor competence requirements in terms of the concept of digital transformation applying the Delphi method approach as Foresight is the most suitable method in this case as the aim is to anticipate the future competence requirements, not to evaluate current supervision practices. Foresight is a method that allows understanding future risks and devising strategic plans through expert insight to address the challenges education is going to face in the future.

The decision to use the Delphi method was based on its comprehensive approach to gathering experts' opinions in stages through well-designed and executed guided surveys and questionnaires. The anonymity and cyclic nature of the Delphi method allow to reach the consensus on the issues of progressive competence development in fast-changing educational environments by ensuring that dominant opinions do not prevail.

The implementation of the method consisted of three phases. Stage one was aimed at identifying future competencies of the supervisors. Stage two was dedicated to rating of those competencies' importance by the experts involved in the survey, while stage three prompted the experts to rethink their responses through presentation of the summary information provided by the panel.

3.2 Research Participants

The study used a chosen panel of experts who possessed vast experience in the field of educational supervision, special education, digital transformation, educational leadership, and teacher professional development. Purposive sampling was chosen because the Delphi technique requires informed judgments from experts instead of statistical representation.

What distinguishes the selection criteria from the purposive sampling is that the experts had academic qualifications and years of expertise in the field of educational supervision, special education, educational technology and digital transformation. Priority was given to experts with a doctoral degree and with considerable experience of working in supervisory positions, leadership positions, universities or other equivalent professional positions. It was necessary for the members of the selected group to have no less than five years of experience in the field and be able to provide references showing their professional qualities.

As for the expert appointments, members of the Delphi panel included educational supervisors, academics, specialists in special education, experts in disabilities, specialists in educational technology and digital transformation. The goal is to choose the different types of experts in order to be able to analyze competencies. According to the Delphi method recommendations, the panel was composed of a group of approximately 27 professionals, which allows for obtaining reliable expert consensus while maintaining effective management of the Delphi process.

3.3 Research Instrument

The primary tool utilized in this study was the Delphi questionnaire, aimed at determining, assessing, and ranking the future competencies which would be necessary for educational supervisors who work with educators in charge of students with intellectual disabilities. The questionnaire was conceived through literature study on educational supervision, educational leadership, digital transformation, special education and competency frameworks.

The development of the Delphi questionnaire was carried out in several stages. Firstly, competencies drawn from the literature were classified into the preliminary domains. The first round of the Delphi study was aimed at reviewing the domains by the experts who had to suggest more competencies, amend the statements in case it was needed and identify any items that needed to be changed. The feedback given by the experts was then used in order to perfect the statements related to competencies of the questionnaire, which then would be used in the next rounds of the study.

The process of the Delphi research consisted of three rounds. The first round was aimed at identifying future competencies with the help of the open questions. The second round was aimed at experts assessing the competencies using Likert scale from 1 (Not important) to 5 (Extremely important). After that, statistical summaries of the responses were shared with the experts, who reviewed and, where appropriate, revised their ratings during the third round to achieve expert consensus.

3.4 Validity and Reliability

To determine content validity, a thorough literature review was conducted and the instrument underwent expert evaluation. The expert assessors analyzed different aspects of competence statements such as relevance, clarity, and sufficiency of information thus contributing to adaptations aimed at improving the instrument quality.

The iterative Delphi method further ensured validity because the participants were provided with a summary of the group responses and had to modify their assessment as needed and reach the informed consensus. Reliability was ensured through standard administration of the questionnaire in all rounds of the research project using identical instructions and rating system. Reliability was evaluated based on the data concerning the extent to which experts altered their ratings over Delphi rounds.

3.5 Data Collection Procedures

Data was obtained via conducting three subsequent iterations of the Delphi Technique. Experts were contacted through email and provided with information about the objectives of the research, the methods used in the research, the confidentiality of their answers, and their voluntary participation.

In the first iteration, the experts answered open-ended questions in order to specify the competencies of the future. The answers were analyzed to create the structured questionnaire for the second iteration when experts rated the competencies according to their importance using a five-point Likert scale. In the third round of Delphi, the participants received the summarized responses of the group along with the experts' previous ratings and had the possibility to change their evaluations. All questionnaires were conducted electronically through online survey tools.

3.6 Data Analysis

The data analysis strategy utilized for the Delphi rounds was an integrative approach of both qualitative and quantitative techniques, whereby the qualitative data from the first round was analyzed through thematic content analysis to identify various competency themes, and hence cluster the common responses, eliminate unnecessary items, and create a primary framework of competency.

The quantitative data collected from the second and third round of the Delphi method was analyzed through descriptive statistics to summarize the assessment given by experts and evaluate the level of consensus reached. Specifically, the statistics collected like frequency distribution, percentages, and mean and standard deviation revealed the level of importance of each competency.

The consensus among the experts was calculated on the basis of percentage agreement, distribution of responses, and fluctuations in rating variance through the Delphi rounds. Competencies that attained the required level of consensus were included in the final framework.

In this paper, competencies were ranked according to their average scores in order to identify which competency area should be given priority. This ranking served as the basis for preparing the competency framework and reaching conclusions.

4. Results

The findings of the study are shown based on the five competency domains revealed using the Delphi process. For each category, descriptive statistics such as averages, deviation from mean, rate of agreement among experts, and ranking for the competency domains are shown. Following the table is a discussion explaining the key findings, as well as the competencies that received the highest or the lowest levels of agreement amongst the experts.

4.1 Future Digital Competencies

The first competency domain examined the future digital competencies required for educational supervisors responsible for supervising teachers of students with intellectual disabilities. Table 4.1 presents the final ratings following the third Delphi round.

Table 1.
Expert Ratings of Future Digital Competencies

Future Digital Competency	Mean	SD	Consensus (%)	Rank
Artificial Intelligence (AI) Literacy	4.91	0.29	96	1
Data Literacy and Learning Analytics	4.86	0.33	95	2
Digital Instructional Leadership	4.82	0.37	94	3
Assistive Technology Integration	4.78	0.41	92	4
Digital Assessment and Evaluation	4.73	0.45	91	5
Cybersecurity and Data Privacy	4.67	0.52	89	6

According to Table 1, all the digital competencies obtained high score, the average ranging from 4.67 to 4.91, signifying a strong agreement among experts regarding their relevance for future education

supervisors. The levels of consensus ranged from 89–96% showing a substantial agreement on the opinions following the third stage of the Delphi process.

Artificial Intelligence (AI) Literacy received the highest rank ($M=4.91$, $SD=0.29$), being ranked first among all digital competencies. The experts considered AI literacy as being significant with regards to understanding AI supported educational tools and their instructional value, as well as guiding teachers in using these tools efficiently and ethically. The importance of data-informed supervision and evidence-based decision-making in digitally renovated environments is seen with a high score of Data Literacy and Learning Analytics ($M = 4.86$, $SD = 0.33$), which ranks second. The combination of Digital Instructional leadership also received a solid rating ($M = 4.82$, $SD = 0.37$), which indicates the role of supervisors in helping teachers use digital technologies in their practice.

Despite the very low value of Cybersecurity and Data Privacy in this area ($M = 4.67$, $SD = 0.52$), its score is above the acceptance level and there are 89% of experts who agree that these issues are very important, which means that even though the experts are oriented on teaching digital competencies, they still understand the importance of protecting information of students, digital platforms and promoting responsible digital behavior.

4.2 Future Leadership Competencies

The second competency domain examined the leadership competencies considered essential for educational supervisors operating within digitally transformed educational systems. The final expert ratings are presented in Table 4.2.

Table

2.

Expert Ratings of Future Leadership Competencies

Future Leadership Competency	Mean	SD	Consensus (%)	Rank
Change Management	4.88	0.30	96	1
Strategic Leadership	4.84	0.34	95	2
Instructional Leadership	4.80	0.38	94	3
Visionary Leadership	4.75	0.43	92	4
Collaborative Leadership	4.71	0.47	91	5
Evidence-Based Decision-Making	4.66	0.54	89	6

The data in Table 2 presented that all abilities of leaders were strongly supported by expert judgment since the mean scores ranged from 4.66 to 4.88 and the level of agreement was from 89% to 96%, meaning their significance for educational managers in digital learning environment has been confirmed.

Change Management scored the highest mean score of $M = 4.88$, $SD = 0.30$, which indicates the importance of leading organizational and technological changes in this area. The experts underlined the significance of the role of supervisors in facilitating teachers' adjustment to modern technologies, constant professional development, and innovation. Strategic Leadership was the second in ranking ($M = 4.84$, $SD = 0.34$) showing the necessity of long-term planning, strategic decision-making, and digital transformation initiatives realization. Instructional Leadership was also highly evaluated ($M = 4.80$, $SD = 0.38$) confirming its importance in improving educational processes.

Collaboration Leadership ($M = 4.71$, $SD = 0.47$) showed that the effective work with teachers, school management, families, and group collaboration is important for inclusive education and technology use. Although Evidence-Based Decision-Making rated the lowest in this category ($M = 4.66$, $SD = 0.54$), it was still higher than the threshold of acceptance showing significance of educational evidence and performance indicators for teachers' improvement and students' learning.

4.3 Future Professional Competencies

The third competency domain examined the professional competencies required for educational supervisors to effectively supervise teachers of students with intellectual disabilities in increasingly complex and technology-enhanced educational environments. The final expert ratings following the third Delphi round are presented in Table 4.3.

Table

3.

Expert Ratings of Future Professional Competencies

Future Professional Competency	Mean	SD	Consensus (%)	Rank
Instructional Coaching and Mentoring	4.89	0.28	96	1
Supervising Inclusive Teaching Practices	4.85	0.32	95	2
Professional Development Planning	4.81	0.36	94	3
Performance Evaluation and Constructive Feedback	4.77	0.40	93	4
Effective Communication and Interpersonal Skills	4.73	0.45	91	5
Reflective Supervision and Continuous Improvement	4.69	0.49	90	6

The data in Table 2 indicate that statistical significance was confirmed for all of the leaders' competencies by the calculated mean scores that ranged from 4.66 to 4.88 and agreement levels from 89% to 96%. Therefore, the data can be considered valid for educational leaders in digital learning. The leader competence that showed the highest mean scores $M = 4.88$, $SD = 0.30$ is Change Management. This fact may highlight that leading changes in this particular field is of great importance. Experts emphasized the significance of the administration's role in teachers' adaptability to modern technology and continuous development. Strategic Leadership is next ($M = 4.84$, $SD = 0.34$). This competence may suggest that long-term planning, strategic decisions, and implementing initiatives for digital transformation are also significant in educational organizations. High scores were given to Instructional Leadership as well ($M = 4.80$, $SD = 0.38$). Collaboration Leadership rates $M = 4.71$, $SD = 0.47$ indicate that productive interaction with teachers, school administrators, families, and teamwork play an important role in inclusive education and technology use. Even though experts rated Evidence-Based Decision-Making the highest in this dimension ($M = 4.66$, $SD = 0.54$), the score is still above the acceptance level.

4.4 Future Ethical Competencies

The fourth competency domain examined the ethical competencies required for educational supervisors to effectively navigate the challenges associated with digital transformation while ensuring responsible, equitable, and professional supervisory practices. The final expert ratings following the third Delphi round are presented in Table 4.4.

Table

4.

Expert Ratings of Future Ethical Competencies

Future Ethical Competency	Mean	SD	Consensus (%)	Rank
Ethical Use of Artificial Intelligence	4.87	0.31	96	1
Data Privacy and Confidentiality	4.84	0.34	95	2
Equity and Inclusive Decision-Making	4.80	0.38	94	3
Professional Integrity and Accountability	4.76	0.42	93	4
Responsible Digital Citizenship	4.72	0.46	91	5
Fairness and Transparency in Supervisory Practices	4.68	0.50	90	6

Table 4 presents a summary of all the rated ethical competencies from the point of view of the experts. Although the average ratings for implementing the various ethical competencies in educational supervision were between 4.68 and 4.87, the respective levels of consensus were between 90% and 96%. The experts consequently considered all of the competencies to be important for application in the described context of technology enhanced education of high complexity and they were in agreement to a high degree.

The highest average rating for an ethical competence was awarded to the Ethical Use of AI with $M = 4.87$ and $SD = 0.31$. This means that it is important to ensure proper and safe use of AI in educational supervision.

Data Privacy and Confidentiality ranked second ($M = 4.84$, $SD = 0.34$) and was followed by Equity and Inclusive Decision-Making ($M = 4.80$, $SD = 0.38$).

The other ethical competencies for educational supervision also received high average ratings. These are the competence of Professional Integrity and Accountability ($M = 4.76$, $SD = 0.42$) which includes honesty and adhering to the ethical rules and ethical standards of the profession. The average rating for the competence of Responsible Digital Citizenship ($M = 4.72$, $SD = 0.46$) indicates that educational supervisors display good practices of technology utilization.

4.5 Future Research and Innovation Competencies

The fifth competency domain examined the research and innovation competencies required for educational supervisors to respond proactively to continuous developments in education and digital transformation. The final expert ratings following the third Delphi round are presented in Table 5.

Table

5.

Expert Ratings of Future Research and Innovation Competencies

Future Research and Innovation Competency	Mean	SD	Consensus (%)	Rank
Evidence-Based Practice	4.89	0.29	96	1
Lifelong Learning	4.86	0.32	95	2
Futures Thinking	4.82	0.36	94	3
Research Literacy	4.78	0.40	93	4
Innovation Management	4.74	0.44	91	5
Design Thinking	4.69	0.48	90	6

The table presents the fact that all research and innovation competencies enjoyed considerable agreement between specialists with average values from 4.69 to 4.89 with level of agreement being between 90% and 96% indicating the importance of the competencies for educational leaders in the changing situation of education. Experimental evidence got the highest score ($M = 4.89$; $SD = 0.29$) which means it is important for administrators to apply research, educational information and experience in the process of decision-making and teaching. Lifelong Learning was rated second ($M = 4.87$; $SD = 0.32$) showing the need of constant professional development when there are changes in technologies, policies and requirements of learners. Futures Thinking has also been praised ($M = 4.82$; $SD = 0.36$) which indicates the importance of prediction of changes in the educational process. Research Literacy ($M = 4.78$; $SD = 0.40$) and Innovation Management ($M = 4.74$; $SD = 0.44$) have also received appreciation as they are significant in evidence-based practice and organizational development. Design Thinking has received the lowest mean score ($M = 4.69$; $SD = 0.48$), having shown conformity to the accepted 90% standard.

4.6 Ranking of Competency Domains

Following the completion of the analysis regarding the different competence domains individually, it is possible to compare the overall competence domains with regard to their importance for the teacher supervisor's training for supervising teachers dealing with children suffering from mental disabilities during the process of digitalization. The domain's average has been computed by averaging out the competencies evaluated in a particular domain. The results are presented in Table 6.

Table

6.

Overall Ranking of Future Competency Domains

Competency Domain	Mean	SD	Consensus (%)	Rank
Future Digital Competencies	4.80	0.40	93	1
Future Leadership Competencies	4.78	0.41	93	2
Future Research and Innovation Competencies	4.80	0.38	93	3
Future Professional Competencies	4.79	0.38	93	4
Future Ethical Competencies	4.78	0.40	93	5

Table 6 outlines the same data from Table 5 that has been analyzed in order to draw certain conclusions. The five key competencies that future educational supervisors will require for the five required competences for the future have been rated by all of the experts who took part in this research. The results demonstrate that all of the competencies have been rated fairly well, with the average score for each of the five key competencies ranging from 4.78 to 4.80. This means that the experts have established only very small differences between the five key competencies, and that they are all considered to be equally important.

The average score for Future Digital Competencies for Educational Supervision even was the highest within the analyzed competency areas ($M = 4.80$). This is followed by Future Leadership Competencies for Educational Supervision ($M = 4.78$). This finding reflects the experts' recognition of the significance of the management and assisting functions within the pedagogical processes of the future educational supervisor.

The lowest scores for Future Ethical Competencies ($M = 4.78$) although minimal, do not downplay the significance of the ethical competence required for effective educational supervision.

In summary, the average values of all competencies under investigation are clearly above the neutral point of 4. Thus, the preparation of future educational supervisors for schools requires a comprehensive approach that allows the respective experts to deal with the digital aspect as well as with the leadership-ethical dimension of practices within educational contexts. The results of the experts' perceptions on the aforementioned issues will be presented and discussed in more detail in the following chapters.

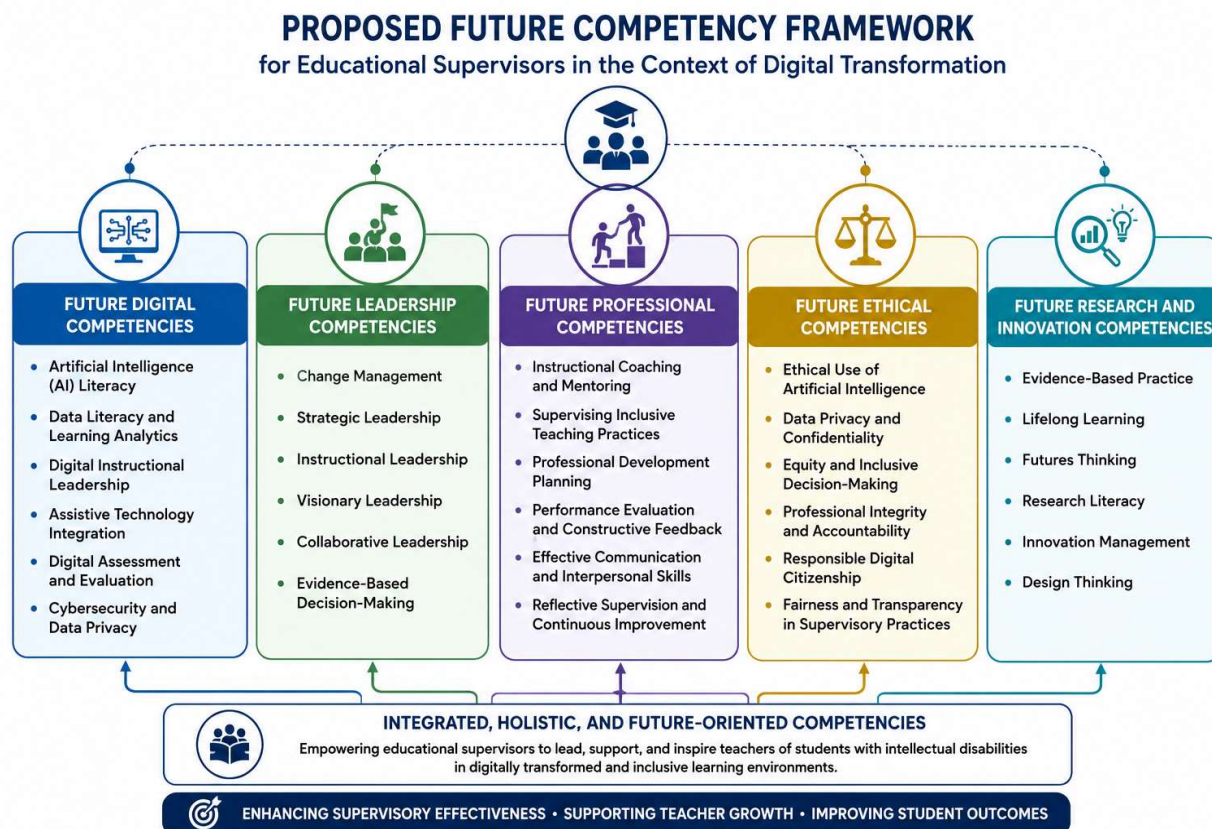
4.7 Final Competency Framework

The concluding phase of the Delphi methodology comprised of the amalgamation of all the outcomes from the five domains of competence in order to come up with the comprehensive competence framework for training educational supervisors who will be overseeing the work of teachers working with students having intellectual disabilities in the context of digital transition process.

Figure

2:

Proposed Future Competency Framework for Educational Supervisors in the Context of Digital Transformation



The final competency framework established through the Delphi method is shown in Figure 4.1. This framework contains five interconnected areas of competency represented through thirty future competencies that illustrate the skill of education supervisors in digitally reorganized educational environments. In particular,

these areas include digital competency, leadership, professional performance, moral responsibility, and research and inventions.

The framework indicates that the process of education supervisors training must not be limited to conventional supervisory competence but include competencies enabling technological progress, inclusive education, and continuous improvement. It gives practical guidance for universities, educational ministries, professional development agencies, and decision makers regarding the process of preparing supervisors and establishing competency norms and professional development programs. Furthermore, this framework can be used as a point of departure for future studies analyzing its use and efficiency in practice.

5. Discussion

5.1 Interpretation and Discussion of the Findings

The study identified essential competences needed by educational supervisors to support teachers teaching students with intellectual disabilities in the digital era. There was consensus amongst the experts regarding acceptability of all the five supervisory competences domains which need to be practiced within an integrated framework of digital, leadership, professional, ethical and research competences. The study contributed to existing knowledge and understanding of transformations taking place in educational supervision practice. There was a shift from monitoring to expertise in technology, from monitoring to instructional leadership, ethical practice and professional development to support teachers of students with intellectual disabilities.

Future Digital Competencies for Educational Supervision is ranked the highest Future Competence of Educational Supervision, anticipated roles and skills that future supervisors of teachers need to support teachers utilizing educational technologies such as AI, learning analytics, digital assessments, and educational assistive technologies for students with intellectual disabilities are depicted in Future Digital Competencies framework of Educational Supervision. For instance, Future Digital Competencies for Educational Supervision ranked highest competency of Future Digital Competencies framework is AI literacy. A supervisor utilizing AI will be able to (1) evaluate AI applications, (2) manage and support teachers utilizing AI, and (3) integrate data from educational technologies into his/her/their supervisory practices.

These results were also supported by other studies related to AI and the digital transformation of education (Rawis & Sumilat, 2025; Nazyrova et al., 2025; Mei et al., 2023; Assanova & Sarzhanova, 2024; Kurmanov et al., 2024; Joseph et al., 2024). According to these researchers, AI literacy is an important component of digital leadership. Consistent with these findings, the experts ranked leadership competencies (Future Leadership Competencies) as the second most important category of future competencies for educational supervision. These future supervisory competencies of educational administration, according to the judgments of the experts, will be enhanced by technology to support and to improve such aspects of work of the educational supervisor as instructional leadership and change management/ strategic leadership/and other supervisory procedures and practices. That is, technology instead of replacing all of the supervisory work of the educational supervisor, as it were, will support such work and enhance it. The findings of this study are consistent with findings reported in several research studies. For example, the use of digital technologies in schools to support development of competencies of future educational leaders is reported by Zhunusbekova et al. (2023), Sulaimanova and Egamberdieva (2025), Domínguez-González et al. (2025), and Wang (2025).

Results showed that all skills under professional competencies of educational supervisors were rated very high by the highest rated was the skill of instructional coaching for supervising teachers. Other skills rated high by the participants were planning, mentoring, and monitoring. Findings of this study are consistent with other studies conducted on supervision, including those of Sumampow and Tudus (2025), Gonçalves da Silva (2025), Marcelino (2022), Prasongmanee et al. (2021), Astuti et al. (2024), and Zanten et al. (2025). All the aforementioned studies discussed about practices of instructional coaching for teachers of students with special needs, implementing inclusive education, and continuing professional development (CPD) for teachers and educational supervisors.

The ethical competencies for educational supervision were also considered equally important by the experts in the field. The increase in dependence on digital technologies and artificial intelligence in schools necessitates responsible leadership. The issues for the ethical use of AI, data protection, issues of equity, the professional integrity of the supervisor and teacher as well as responsible digital citizenship of students are crucial for the supervisor. The findings of this study are supported by the research of Assanova and Sarzhanova (2024), Morze and Strutynska (2019), Prasad et al. (2019), Rahyasih et al. (2019), and Leila and Djabri (2019).

Research and innovation competency ranked fifth place, although individually the skills contained many high-ranking items. These included items such as those that describe practices that are supported by evidence, those that describe people who are able to utilize research in order to help improve their own

practice, those who are able to engage in lifelong learning, those who are able to manage and implement innovation, those who are able to utilize design thinking and those who are able to perceive and plan for future possibilities. Thus, supervisors in educational administration must be able to not only react to change but also to lead and anticipate change in a number of dimensions (Martinez et al., 2019; Najmudin et al., 2019; Rego et al., 2017; Hamzah et al., 2019; Kormakova et al., 2017; M. & Valanteena, 2018).

While Future Digital Competencies emerge as the core element of Future Supervision Competencies, the five categories of competences of educational supervisors are connected and therefore will function as a whole. Effective educational administration is characterized by an integrated approach which combines the Digital Competence with the Leadership Competence, the Professional Competence, the Ethical Competence and the Research-and-Innovation Competence without giving priority to one of the categories.

This study offers new theoretical perspectives for educational leadership, digital transformation, for competence-based education, special pedagogy and for foresight. All these areas of research are connected and put together in this study to develop a competence model for future administrators in education. This model differs from previously introduced models.

5.2 Discussion of the Proposed Competency Framework

This study resulted in a newly developed competence framework for educational supervisors. Future teachers working with students with intellectual disabilities and teaching in a digital environment will be supervised by educational supervisors who, within their scope of action, can function as digital leaders, as coaches and mentors for teachers and as decision makers in an ethical and responsible manner. The five areas of competence are interconnected and offer a new perspective on the future of educational supervision.

A special feature of the proposed framework is its integrated nature. All of the proposed digital competences as well as the leadership, professional, ethical and research competences are interconnected and provide a forward-looking perspective for future supervisors. Thus, the supervisor with required competences possesses technological knowledge and an ethical approach, is able to teach, use data to make decisions, and learn throughout his/her life to innovate in educational settings (Sulaimanova & Egamberdieva, 2025).

The framework can be a powerful tool for a range of stakeholders including Higher Education Institutions, the Ministry of Education and other relevant educational authorities. Such bodies can use the framework in the development of training programs for the supervisors of teachers, in the determination of relevant competence for supervisors, in the setting out of certification criteria for supervisors and in support of a range of educational projects. The framework is particularly useful for enabling the supervisors of teachers of students with intellectual disabilities to assess their own competence and that of their performance. Such an assessment will enable them to continue to develop their professional skills into the adult years. A new perspective on educational supervision is offered by this framework and it presents the work of such supervisors from a collaborative perspective. The evidence-based practices of these digital leaders, mentors and innovators are key to good educational practice and are presented in this framework for the supervision of teachers of students with intellectual disabilities. However, the framework also offers some insights into the development of general competences for educational supervision and, thus, the framework can be used as a starting point for advancing the competences for the work of educational supervisors

5.3 Limitations and Future Research

This study has a number of limitations. The method that was used for this study is the Delphi method. This method is based on the opinions of experts and does not include any empirical data. Therefore, the framework for supervision that was presented in this study has to be accompanied by additional empirical studies in order to function properly.

The views of the panels of experts can differ from those of other professionals. As the members of the panels of experts are currently active in the various professional domains, their views will more likely reflect the way of thinking and practice of current elements within the system of education and of the relevant educational policies, and of the use of technology.

Future research will be necessary to test the framework in different educational environments, and it should involve different groups of educators, for example school managers, teachers and other staff members involved in the management of schools. Also, quantitative studies evaluating the implementation of the competence-based education and training using the framework proposed in this article, such as experimental or/and longitudinal research, would be relevant. Also, future research should be focused on the study of educational supervision in different countries, as well as the effects of using specific technologies in educational supervision.

Even though the model presented here has its restrictions, it can be a good basis for future research projects and for the teacher training required for the educational environment in the information age.

6. Conclusion

This study describes the needed competences of future supervisory managers in schools, particularly those supervising teachers teaching students with intellectual disabilities in the digital era. A future oriented competency framework for educational supervisors was developed using foresight techniques and the Delphi method with input from experts in the field of education.

The study found five key competencies for future educational supervision. The competency for digital supervision is considered very relevant, however all five competency domains are of equal importance to develop effective educational supervision.

The proposed framework can be of use to a wide array of organizations including universities, as well as to ministries and institutions of education, educational authorities, as well as to professional education institutions and organizations, in order to provide recommendations for future supervisors based on the current research.

Future supervisors have to be equipped with the necessary competencies in order to change and improve the supervision of teaching in the ongoing changes of the educational systems.

References

- Assanova, D., & Sarzhanova, G. (2024). *Digital competencies of a teacher in the context of educational transformation*.
- Astuti, R., Sutiah, Hidayatulloh, & Nisak, N. (2024). Transformation of educational supervision with digital technology: Implementation, opportunities and challenges. *Academic Journal Research*, 2, 89–106. <https://doi.org/10.61796/acjoure.v2i1.122>
- Atamuratov, R., & Xushvaqov, A. (2025). Digital transformation in education: The beginning of a new era. *Bulletin of Science and Practice*, 11, 294–300. <https://doi.org/10.33619/2414-2948/110/35>
- Domínguez-González, M. D. L. Á., Luque de la Rosa, A., Hervás-Gómez, C., & Román-Graván, P. (2025). Teacher digital competence: Keys for an educational future through a systematic review. *Contemporary Educational Technology*, 17, ep577. <https://doi.org/10.30935/cedtech/16168>
- Gonçalves da Silva, C. (2025). The future competencies & skills development cycle: A new workforce model in the context of digital transformation and artificial intelligence. *Journal of Human Resource Management – HR Advances and Developments*, 28, 139–155. <https://doi.org/10.46287/TWKU1629>
- Hamzah, N. H., Radzi, N., & Omar, I. (2025). Digital leadership competencies through a systematic literature review: Bridging educational development and organizational success. *International Journal of Modern Education*, 7, 37–64. <https://doi.org/10.35631/IJMOE.724003>
- Irkha, A., Hurskaya, V., Hryshchuk, M., Tereshchuk, V., & Chyryva, H. (2024). Digital transformation in education: Leveraging technology for enhanced learning experiences. *Futurity Education*, 4–17. <https://doi.org/10.57125/FED.2024.09.25.01>
- Joseph, O., Onwuzulike, O., & Shitu, K. (2024). Digital transformation in education: Strategies for effective implementation. *World Journal of Advanced Research and Reviews*, 23. <https://doi.org/10.30574/wjarr.2024.23.2.2668>
- Kormakova, V., Klepikova, A., Lapina, M., & Rugel, J. (2021). *ICT competence of a teacher in the context of digital transformation of education*.
- Kurmanov, N., Bakirbekova, A., & Adilbekuly, M. (2024). The manager's digital competencies in education system: A systematic review. *Economic Series of the Bulletin of the L.N. Gumilyov ENU*, 141–157. <https://doi.org/10.32523/2789-4320-2024-2-141-157>
- Leila, I., & Djabri, S. (2025). Digital transformation in education and its role in the development of the efficiency of educational institutions and in the enhancement of the quality of their outputs. *International Journal of Innovative Technologies in Social Science*. [https://doi.org/10.31435/ijitss.2\(46\).2025.3961](https://doi.org/10.31435/ijitss.2(46).2025.3961)
- M., M., & D., V. (2022). Digital transformation in education. *EPRA International Journal of Economic and Business Review*, 58–64. <https://doi.org/10.36713/epra11864>
- Marcelino, V. (2022). *Future skills and competencies for the management of digital transformation*.
- Martinez, M. Á., Dumitrascu, A., Simarro, J., Martinez, A., & Duygulu, A. (2025). *Digital transformation in education*.
- Mei, L., Feng, X., & Cavallaro, F. (2023). Evaluate and identify the competencies of the future workforce for digital technologies implementation in higher education. *Journal of Innovation & Knowledge*, 8, 100445. <https://doi.org/10.1016/j.jik.2023.100445>

Future Competencies for Preparing Educational Supervisors to Supervise Teachers of Students with Intellectual Disabilities in the Context of Digital Transformation: A Foresight Study

- Morze, N., & Strutynska, O. (2021). *Digital transformation in education: Model for higher educational institutions*. <https://doi.org/10.5220/0000159000003431>
- Najmudin, D., Susanti, L., & Pebrian, I. (2025). Digital transformation in education: Challenges and opportunities in the age of AI. *Pedagogia*, 23. <https://doi.org/10.17509/pdgia.v23i1.78405>
- Nazyrova, A., Miłosz, M., Bekmanova, G., Omarbekova, A., Aimicheva, G., & Kadyr, Y. (2025). The digital transformation of higher education in the context of an AI-driven future. *Sustainability*, 17, 9927. <https://doi.org/10.3390/su17229927>
- Prasad, R., Sharma, R., Aran, A., & Bhardwaj, V. (2024). Digital transformation in higher education: Analysis of student learning outcomes. *ShodhKosh: Journal of Visual and Performing Arts*, 5. <https://doi.org/10.29121/shodhkosh.v5.i6.2024.2088>
- Prasongmanee, C., Wannapiroon, P., & Nilsook, P. (2021). Synthesis of digital supervisor competency (pp. 161–166). <https://doi.org/10.1109/RI2C51727.2021.9559792>
- Rahyasih, Y., Permana, J., & Syarifah, L. (2024). The effect of education supervision from school supervisors on teacher competence and its impact on the quality of digital learning. *SHS Web of Conferences*, 197. <https://doi.org/10.1051/shsconf/202419701011>
- Rawis, J., & Sumilat, M. (2025). Digital education governance: Implementation of information technology-based supervision. *Jurnal Masyarakat Digital*, 1, 25–29. <https://doi.org/10.64924/bt016025>
- Rego, B., Lourenço, D., Moreira, F., & Santos-Pereira, C. (2023). Digital transformation, skills and education: A systematic literature review. *Industry and Higher Education*, 38. <https://doi.org/10.1177/09504222231208969>
- Sulaimanova, R., & Egamberdieva, A. (2025). Professional development of teachers in the context of digital transformation. *Bulletin of the Jusup Balasagyn Kyrgyz National University*, 9–20. [https://doi.org/10.58649/1694-8033-2025-3\(123\)-9-20](https://doi.org/10.58649/1694-8033-2025-3(123)-9-20)
- Sumampow, Z., & Tudus, M. (2025). Transformation of the role of educational supervisors in the digital era: Adaptation strategies and supervision innovations. *Jurnal Masyarakat Digital*, 1, 30–36. <https://doi.org/10.64924/p0kwqa11>
- Wang, X. (2025). Reconstructing graduate supervisors competencies from the perspective of artificial intelligence. *Revista Cubana de Administración Pública y Empresarial*, 9. <https://doi.org/10.5281/zenodo.16948695>
- Zanten, M., Uerz, D., Neut, I., Rooij, P., Gorissen, P., & Kral, M. (2025). *Leading digital educational transformation: A competency framework*.
- Zhunusbekova, A., Zelvys, R., Askarkyzy, S., & Bekzhanova, B. (2023). The development of digital competencies among teachers in the context of transition to the "University 4.0". *Pedagogy and Psychology*, 56. <https://doi.org/10.51889/2960-1649.2023.15.3.010>
- Zizikova, S., Nikolaev, P., & Levchenko, A. (2023). Digital transformation in education. *E3S Web of Conferences*, 381. <https://doi.org/10.1051/e3sconf/202338102036>