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New digital era competences for the inclusive teacher: Strategic implications for human resource management in pre-university education

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Abstract: In the current context of digitalization, the teacher's role is inevitably transformed, particularly regarding the challenges of educational equity. This analysis explores the link between the use of digital tools—devices, platforms, and software—and the principles of inclusive education, aiming to establish the foundations of the essential competences that every practitioner supporting students with special educational needs (SEN) must master. Computerization and the demand for equity in pre-university education redefine the professional profile of teachers. This article analyzes the intersection of digital and inclusive dimensions and proposes a new framework for inclusive digital competences. Interactive digital environments are now indispensable for all learners, extending far beyond just students with special educational needs. They foster direct, real-time engagement on dedicated platforms, sitting at the core of the relationship between pedagogical production and immediate responsiveness, while offering instant feedback on student responses. The strategic human resource management strategy serves as a central lever for organizational transformation in the education sector. This article analyzes how managers, through their leadership actions, can promote these types of inclusive digital competences via strategic recruitment, performance evaluation based on learning analytics data, and strategic educational mentoring programs in digital psychopedagogy. Such an integrated professional matrix provides the opportunity for a sustainable and high-performing decision-making framework.

Keywords: strategic human resource management, digital pedagogy, inclusive education, inclusive digital competences, pre-university education.

Résumé : Dans le contexte actuel de numérisation, le rôle de l'enseignant se trouve inévitablement transformé, notamment au regard des enjeux liés à l'équité éducative. Cette analyse explore le lien entre l'utilisation d'outils numériques – dispositifs, plateformes et logiciels – et les principes de l'éducation inclusive, visant à poser les bases des compétences essentielles que tout professionnel accompagnant des élèves à besoins éducatifs particuliers (BEP) doit maîtriser. La numérisation et l'exigence d'équité dans l'enseignement pré-universitaire redéfinissent le profil professionnel des enseignants. Cet article examine l'articulation entre les dimensions numériques et inclusives, et propose un nouveau référentiel de compétences numériques inclusives. Les environnements numériques interactifs sont désormais indispensables à tous les apprenants, bien au-delà des seuls élèves à besoins éducatifs particuliers. Ils favorisent un engagement direct et en temps réel sur des plateformes dédiées, au cœur de l'interaction entre la production pédagogique et la réactivité immédiate, tout en offrant un retour instantané sur les réponses des élèves. La gestion stratégique des ressources humaines constitue un levier central de la transformation organisationnelle dans le secteur de l'éducation. Cet article analyse comment les responsables, par leurs actions de leadership, peuvent favoriser le développement de ces compétences numériques inclusives, notamment via un recrutement stratégique, une

évaluation de la performance fondée sur les données issues de l'analyse de l'apprentissage (« learning analytics »), ainsi que des programmes de mentorat pédagogique axés sur la psychopédagogie numérique. Une telle matrice professionnelle intégrée offre un cadre décisionnel durable et performant.

Mots-clés : gestion stratégique des ressources humaines, pédagogie numérique, éducation inclusive, compétences numériques inclusives, enseignement pré-universitaire**.**

Classification JEL : M12, I21, O33.

1. Introduction

Today's pre-university education is undergoing a dual transition: the modernization and acceleration of the digitalization of teaching processes, alongside the necessity of guaranteeing the inclusion of all students with special educational needs. In this complex landscape, the role of teaching staff has been substantially redefined, initially driven by the pandemic context and subsequently by the rise of Artificial Intelligence (AI). The teacher can no longer be considered a mere transmitter of content or a passive facilitator; they become a manager of diversity within hybrid or fully digital learning spaces (UNESCO, 2021).

Traditionally, literature and professional development programs treat digital (technical) competences and inclusive (pedagogical and social) competences separately. However, classroom observations reveal a major gap between teachers' basic digital skills and their actual ability to mobilize them to design adapted digital educational resources, which are indispensable for guaranteeing accessibility and promoting equal opportunities (European Commission, 2017).

Consequently, it is necessary to create a different pedagogical profile that incorporates inclusive digital competences (European Commission, 2017). School leadership must establish digital professional contexts for pre-university teachers working with students with special educational needs (SEN) to acquire these types of competences. Technology must serve as an adaptive tool to personalize learning rather than reinforce inequalities (Rose & Meyer, 2002). This enables the creation of personalized pedagogical resources adapted to the type and degree of the students' specific impairments. This transformation of the teachers' professional profile exerts direct pressure on the management of pre-university institutions. Teachers can neither develop nor apply these complex competences alone; a dual institutional ecosystem is essential to support their evolution across both inclusive and digital dimensions (Tejada-Fernández et al., 2023). While digitalization progresses rapidly, the development of inclusive competences still needs reinforcement. Strategic Human Resource Management (SHRM) therefore becomes essential (Wright & McMahan, 1992). It is necessary to shift from administrative management to the strategic management of human potential (Marler & Boudreau, 2017). SHRM must align the school's inclusive vision with concrete policies for recruitment, evaluation, mentoring, and continuous training. This article proposes an analysis and definition of inclusive digital competences, which must belong to the modern teacher's professional portfolio, as well as a strategic human resource management approach aimed at integrating these competences into the educational organization's culture. Such an approach offers an integrated conceptual matrix designed for educational managers making long-term institutional decisions.

2. The Profile of Inclusive Digital Competences at the Individual Level

Redefining the professional profile of pre-university teachers implies permanently moving past the traditional separation between strictly technical skills and inclusive or psycho-pedagogical ones. Under this new educational paradigm, inclusive digital competence centers on the teacher's strategic ability to orchestrate highly interactive virtual learning environments. These digital spaces are no longer mere delivery mediums, but genuine vehicles for the empowerment and emancipation

of students with special educational needs (SEN) (Pozas & Letzel, 2023). This competence profile is structured around three interdependent operational dimensions:

A. Universal Design for Learning in Digital Environments (UDL-D) and AI-Augmented Curricular Adaptation

This first dimension rests on the teacher's aptitude to design and deploy flexible content, rigorously tailored to the learner's specific needs and their degree of functional, intellectual, or physical impairment (CAST, 2018). Thanks to the integration of cutting-edge technologies and generative artificial intelligence (AI) tools, it is now possible to transpose and adapt a single learning unit into multiple formats and varying levels of complexity (Ok & Rao, 2021). This process translates concretely into the cognitive simplification of texts for students with autism spectrum disorders (ASD) or learning difficulties, or the configuration of augmentative visual and auditory interfaces. Thus, the teacher's value added lies in their capacity to select optimal prompts and AI algorithms to generate personalized educational resources, thereby eliminating rigid curricular standardization (Chai et al., 2023).

B. Direct Digital Interaction and Autonomy of Students with SEN

A vital dimension of this profile concerns the teacher's ability to design activities where technology is actively and directly used by the student, who thus becomes the primary actor in their own cognitive progress (Crompton et al., 2022). The inclusive teacher must know how to select and configure interactive platforms that allow students with SEN to work and complete tasks autonomously. Through accessible and adapted interfaces, the student benefits from an individualized and contextualized dyadic pathway (Alnahdi, 2021). This setup grants them greater control over their learning pace, stimulates intrinsic motivation, and reduces the anxiety often generated by traditional, public modes of evaluation.

C. Adaptive Digital Assessment and Immediate Feedback

The integration of adaptive digital assessment systems is closely tied to the student's direct interaction with digital pedagogical tools. Here, the teacher's inclusive digital competence is reflected in their ability to monitor, analyze, and interpret real-time data from instant assessments (Drigas & Lyritsis, 2021). As a student with special educational needs (SEN) progresses through a platform, the system immediately evaluates their responses and provides personalized, non-punitive feedback. In the event of an error, adaptive algorithms and AI automatically adjust the difficulty level of subsequent items and offer visual cues or additional explanations tailored to the student's learning profile (Moser et al., 2024). Teachers must therefore master the management of this real-time data stream (learning analytics) to dynamically adjust support strategies and validate every learner's progress, no matter how small (Siemens, 2022).

3. The Dual Institutional Ecosystem as a Facilitating Factor

The development and manifestation of inclusive digital competences among pre-university teachers, regardless of their initial training level, imperatively require a supportive managerial environment to translate into effective classroom practices. The institutional environment plays a decisive role in this regard. In this sense, the school must be analyzed as a dual organizational ecosystem structured around two indispensable and interdependent professional spheres: the inclusive, psychoeducational, and cultural component on one hand, and the digital, technical, and structural component on the other. This managerial openness is essential to anchor technological innovation within the school's daily reality. This dual ecosystem is configured through three operational pillars at the organizational level:

A. Inclusive Digital Infrastructure and Accessible Pedagogical Architecture

The first dimension of the ecosystem concerns the provision of hardware and software resources, without which direct interaction between students with special educational needs (SEN) and educational platforms becomes impossible. A school can no longer be evaluated solely by the number of computers it owns, but by the accessibility level of its technology. School leadership must guarantee an appropriate digital infrastructure, including touch screens, adapted keyboards (including Braille systems if necessary), and an adapted software environment. This implies acquiring licenses for applications based on artificial intelligence, speech synthesizers, and online learning platforms that comply with international web accessibility standards (Hersh, 2024). Furthermore, this ecosystem requires a rapid technical support service (internal helpdesk) designed to minimize downtime caused by technical glitches, which can severely disrupt the routine and emotional stability of students.

B. Open Organizational Culture and a Climate of Psychological Safety

The second dimension of the dual ecosystem goes beyond tangible resources and falls squarely within the realm of organizational culture. Integrating generative artificial intelligence and emerging technologies, and rigorously adapting them to the degree of impairment of students with SEN, is a laborious, iterative, and emergent process. Consequently, the institution must offer a climate of psychological safety where teachers are neither penalized nor stigmatized for initial failures when using new digital tools (Edmondson, 1999). An organizational culture centered on inclusion values pedagogical innovation and flexibility, turning risk management into an opportunity for collective learning (Garvin et al., 2008). When teachers feel supported and protected from the pressure of rigid bureaucratic evaluation, their willingness to experiment with interactive and adaptive digital solutions increases considerably (Wright & McMahan, 1992).

C. Support Communities and Mentoring in Inclusive Digital Pedagogy

As the final component of the dual ecosystem, social capital and mutual support networks cannot rely solely on external continuous training and professional development courses. It is necessary to structure specialized methodical commissions within which good practices from communities of practice and mentoring in inclusive digital pedagogy are disseminated and implemented. A sustainable institutional ecosystem stimulates the creation of these internal cells, where teachers with advanced digital skills collaborate directly with itinerant or support teachers, the school psychologist, and less experienced mainstream teachers (Wenger-Trayner & Wenger-Trayner, 2020). Through peer-to-peer mentoring mechanisms, a contextualized transfer of knowledge is ensured. This setup allows for the resolution of specific problems, such as configuring an adaptive platform for a particular student or interpreting data analytics (learning analytics) provided by the software system's instant feedback, thereby optimizing integrated institutional responsiveness.

4. Mechanisms of Strategic Human Resource Management (SHRM) in Pre-University Education

The transition from traditional personnel administration to Strategic Human Resource Management (SHRM) constitutes the driving force behind implementing inclusive digital competences within the dual school ecosystem (Wright & McMahan, 1992). From the perspective of contemporary public management research, human potential is no longer perceived as a passive asset, but as a critical vector of organizational transformation (Wright & McMahan, 1992).

For an educational institution to become truly inclusive and technology-driven, the school leadership team must act through three fundamental strategic mechanisms:

A. Job Description Optimization and Hybrid Competence-Based Recruitment

Traditional recruitment of pre-university teaching staff generally relies on strictly administrative criteria and specialization within a single discipline. SHRM proposes to re-evaluate these standards by explicitly integrating inclusive digital competences into job descriptions and candidate selection profiles. Aligning this institutional strategy with international frameworks, such as the European Framework for the Digital Competence of Educators (DigCompEdu), allows school principals to evaluate, right from the selection phase, future teachers' capacity to design accessible content (European Commission, 2017). Through this approach, candidate selection will no longer be limited to the formal evaluation of a physical portfolio, but will shift toward verifying practical skills in managing diversity digitally within the virtual environment. This will guarantee that new teachers entering the education system are fully prepared to meet the challenges and adapt to the realities of an inclusive classroom.

B. Reconfiguration of Performance Evaluation Systems and Data-Driven Management

Current evaluation systems in the pre-university environment often suffer from excessive bureaucratization, where teachers' activities are measured by the volume of administrative documents completed rather than their direct pedagogical impact. In the context of inclusive digitalization, SHRM introduces performance-based evaluation mechanisms directly linked to data from interactive educational platforms. School managers must value teachers' capacity to leverage learning analytics tools (Marler & Boudreau, 2017). Teacher evaluation abandons the formal inspection of physical portfolios in favor of analyzing how the teacher utilizes immediate software feedback to support the autonomous progress of students with SEN, dynamically adapting tasks based on this feedback.

C. Agile Professional Development Strategies and Mentoring in Digital Pedagogy

National diagnostic analyses highlight major gaps between teachers' theoretical digital skills and their actual pedagogical applicability to support vulnerable students (Ministerul Educației, 2023). SHRM steps in to remedy this by abandoning standardized, mass training programs—which serve only the bureaucratic accumulation of transferable professional credits—in favor of continuous professional development and training strategies designed to be implemented directly within inclusive classrooms.

In this view, human resource management stimulates micro-learning and mentoring in inclusive digital pedagogy by facilitating contextualized and agile training sessions focusing on assistive technologies and Universal Design for Learning (UDL) (CAST, 2018). Instead of being directed to generic digital literacy courses, teachers are trained to apply artificial intelligence to generate educational materials closely aligned with their students' specific needs and levels of disability.

Table 1. Integrated Conceptual Matrix for Digital-Inclusive Education

Level of Analysis	Conceptual Dimension	SHRM Implementation Mechanism	Impact on Students with SEN
Individual Level	Profile of digital-inclusive competences	Integration of DigCompEdu standards in the initial evaluation.	Personalized learning adapted to the level of impairment.
Individual Level	Direct interaction and autonomy	Designing interactive tasks on educational platforms.	Stimulation of intrinsic motivation and reduction of anxiety.
Individual Level	Adaptive assessment and real-time feedback	Use of data tracking systems (Learning Analytics).	Rapid and non-punitive correction during exercises.
Organizational Level	Infrastructure and digital architecture	Sourcing adaptive software and assistive technologies.	Universal access to content and elimination of physical barriers.
Organizational Level	Psychological safety (Safe space)	An open climate that encourages experimentation and innovation.	Protection of educational routines through the elimination of technical errors.
Organizational Level	Communities of practice (Peer-to-peer)	Internal mentoring between mainstream and support teachers.	Rapid institutional intervention and integrated response to SEN.
Strategic Level	Strategic recruitment and selection	Updating job descriptions with digital pedagogy competences.	Guaranteeing a teaching staff fully prepared for diversity.
Strategic Level	Data-driven performance evaluation	Shifting from bureaucratic portfolios to real pedagogical impact.	Dynamic adjustment of support based on the student's real progress.
Strategic Level	Agile professional development	Micro-learning programs focused on using AI for inclusion.	Instantly generated learning materials adapted to classroom needs.

Source: Author's own elaboration, based on the reviewed literature.

5. Conclusions and Managerial Implications

A. Conclusion

This article demonstrates that with the introduction of artificial intelligence and the acceleration of the digital teaching-learning process in pre-university education, the success of inclusive education can no longer be guaranteed through a fragmented or traditional administrative approach. This is especially true as the number of students with special educational needs (SEN) increases year by year. The analysis highlights that the mere possession of basic digital skills by teachers is insufficient without structural integration within an inclusive pedagogy.

The role of the teacher is profoundly redefined by the emergence of these inclusive digital competences, transforming the teacher from a simple content mediator into an architect and analyst of adapted virtual environments. This new professional profile proves fully capable of offering support or assistance to students with SEN to enable their autonomous or emancipatory use of interactive platforms. The cognitive pathway thus takes on a different evaluative dimension

depending on the type and degree of functional impairment, thanks to the use of instant feedback and metacognitive self-assessment.

From an organizational standpoint, the main conclusion is that a teacher's individual performance remains latent in the absence of a dual institutional ecosystem that simultaneously guarantees an inclusive digital infrastructure and a climate of psychological safety conducive to innovation and mentoring in digital pedagogy (Edmondson, 1999). Consequently, the responsibility for translating these concepts into the daily reality of the school falls directly upon the school leadership.

B. Managerial Implication

The managerial implications derived from this conceptual matrix require a profound reform of Strategic Human Resource Management (SHRM) mechanisms at the school level (P. M. Wright, G. C. McMahan, op. cit., p. 315):

- At the recruitment and selection level: Leadership teams must look beyond administrative criteria and operationalize selection profiles based on inclusive digital competences, drawing on benchmarks such as DigCompEdu to assess new recruits' capacity to design accessible content (European Commission, 2017).
- At the performance evaluation level: It is mandatory to shift the focus away from physical portfolio bureaucracy toward data-driven analysis (learning analytics). Managers must qualitatively evaluate how teachers use data generated by educational platforms to dynamically calibrate tasks and generate adapted resources based on the responses of students with SEN (Marler & Boudreau, 2017).
- On the professional development front: Standardized mass training courses should be abandoned in favor of agile micro-learning strategies and internal communities of practice. Peer-to-peer mentoring in inclusive digital pedagogy within the school constitutes the optimal solution for rapid internalization of generative AI techniques and contextualized curricular adaptation.

In conclusion, the article shows that technology and digital psychopedagogy are the primary vectors of equal opportunities and educational equity, provided they are supported by managerial strategies implemented and oriented toward the sustainable development of human resources.

C. Research Limitation

Despite its theoretical and conceptual contributions, this study presents several inherent limitations:

1. Conceptual Nature of the Research: The proposed matrix is conceptual and theoretical, synthesizing interdisciplinary literature across strategic human resource management, digital pedagogy, and inclusive education without presenting immediate empirical data testing the hypothesized causal links.

2. Contextual and Institutional Autonomy: The operationalization of the SHRM mechanisms relies on a degree of institutional and managerial autonomy that varies substantially across national and centralized pre-university education systems.

3. Breadth of SEN Classifications: The framework addresses students with special educational needs as an overarching category; however, specific categories of impairments (sensory, cognitive, neuromotor) require distinct software configurations and varying degrees of direct digital autonomy.

D. Future Research Directions

As an extension of the theoretical and conceptual framework developed in this doctoral research, future studies will focus on the empirical validation of the proposed model. This objective will be achieved by applying a mixed-methods research design (quantitative and qualitative) to a

representative sample of pre-university teachers, itinerant and support teachers, and school managers, in order to identify statistical correlations between strategic management styles and the degree of digital autonomy acquired by students with special educational needs.

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