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The Concept and Paradigm of Mentoring in Inclusive Higher Education in the Era of the New Technological Order

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ABSTRACTS

This paper develops a comprehensive conceptual framework for mentoring in inclusive higher education within the context of the emerging 22nd technological order. The study analyzes the historical evolution of mentoring as a form of knowledge transmission and examines its transformation in modern inclusive universities. Using historical, logical, and systematic methods, the article clarifies the definition, functions, and pedagogical tools of mentoring for students with disabilities. A comparative analysis of mentoring, tutoring, curation, and scientific supervision is conducted to identify their distinctive features in inclusive practice. The paper further proposes a paradigm of inclusive mentoring that integrates philosophy, ideology, organizational culture, and strategic policy. A four-level model for assessing the quality of inclusive mentoring is introduced, highlighting its relevance for educational outcomes, socialization, and career development of students with disabilities. The findings underscore the increasing importance of mentoring as a key pedagogical mechanism in the new technological era.

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1. INTRODUCTION

Inclusive higher education has become increasingly important in the context of rapid technological, economic, and social transformation. Many reports regarding this matter have been well-documented (Ashurova *et al*., 2026; Faddillah *et al*., 2022; Musayaroh *et ali.,* 2023; Adesokan & Bojuwoye, 2023; Baxtiyor & Sardor, 2024; Oktamovna & Ruslanovna, 2024; Khudayshukurovna *et al*., 2024). As societies enter what scholars identify as the *22nd technological order*, marked by advances in nanotechnology, neurotechnology, robotics, and digital ecosystems, higher education institutions must respond to new challenges and expectations. Within this shifting environment, mentoring plays a vital role in supporting students with disabilities as they navigate complex learning processes, develop future-oriented competencies, and prepare for an evolving labor market. This need is amplified by the emergence of nearly 500 new professions annually, which demand adaptive learning, flexible skill acquisition, and continuous professional guidance.

Existing studies highlight the long-standing role of mentoring as one of the earliest forms of knowledge transmission, predating formal academic instruction in classical schools and medieval universities. In inclusive education, mentoring is recognized for its contributions to competence development, personalized learning, and professional growth among students with disabilities (Dzhaparova, 2021). Scholars also emphasize mentoring as a component of inclusive practice that fosters collaboration, community building, and mutual support. Furthermore, mentoring is seen as a humanizing force, promoting empathy, social integration, and equitable opportunities in higher education. Despite its historical prominence and increasing relevance, mentoring in inclusive higher education remains insufficiently theorized. The rapid diversification of pedagogical roles (such as mentors, tutors, curators, supervisors, and instructors) creates conceptual ambiguity and highlights the need for a clearer methodological and paradigmatic distinction. These developments indicate that mentoring should be viewed not simply as a support practice, but as a sophisticated pedagogical system involving the transmission of professional culture, explicit and implicit knowledge, and individualized guidance.

Therefore, based on the previous studies (Glushchenko, 2025; Glushchenko, 2023; Glushchenko & Inei, 2024; Glushchenko,l 2024; Glushchenko, 2022), this article seeks to refine the conceptual foundations of mentoring in inclusive higher education and articulate a paradigm that aligns with contemporary technological and pedagogical realities. The novelty of this study lies in its development of a comprehensive mentoring paradigm tailored specifically to inclusive higher education within the context of the new technological order. Unlike previous works that examine mentoring as an isolated method or support activity, this article conceptualizes mentoring as an integrated educational product and proposes a structured paradigm that encompasses philosophical foundations, ideological positioning, organizational culture, and strategic policy. Additionally, the study introduces a four-level model for evaluating the quality of inclusive mentoring, offering a new analytical framework for assessing its effectiveness in supporting students with disabilities.

2. METHODS

This study employed a combination of historical, logical, systematic, and comparative methods to develop a comprehensive conceptual framework for mentoring in inclusive higher education. The methodological design was based on the assumption that mentoring, as one of the earliest forms of knowledge transmission, must be examined through both its long

historical evolution and its transformation within the emerging 22nd technological order. Therefore, the study integrated both diachronic and synchronic analytical approaches.

First, historical analysis was used to trace the development of mentoring from prehistoric forms of skill transfer to its contemporary function in inclusive universities. This method provided insight into technological periods—from the Stone Age to the present era of nanotechnology and digital ecosystems—and highlighted shifts in pedagogical practices across time. Through this analysis, the study identified structural changes and persistent features in the evolution of mentoring. Second, a logical and systematic analysis was applied to clarify the conceptual boundaries of mentoring. Logical analysis examines (general fact) the internal relationships within mentoring processes, while systematic analysis situates mentoring within broader organizational and cultural structures in inclusive higher education. These methods allowed the researcher to define mentoring in relation to tutoring, curation, teaching, and scientific supervision. Third, comparative analysis was conducted to differentiate mentoring from related pedagogical roles and to identify the unique characteristics of inclusive mentoring. By comparing descriptive models of mentoring, tutoring, curation, and supervision, the study revealed differences in competencies, communication patterns, organizational functions, and cultural attributes. Fourth, the study used pedagogical observation and heuristic techniques to identify mentoring tools relevant to inclusive higher education. These tools include diagnostic assessment, research training, advisory and psychological support, and the transfer of professional organizational culture. Heuristic methods, such as conceptual modeling and expert reflection, support (general truth) the development of paradigmatic structures in inclusive mentoring.

Finally, an analysis of scientific publications was carried out to synthesize existing knowledge on mentoring, inclusive pedagogy, and technological change. This literature analysis provides (general truth) additional context for understanding competence development, collaborative mentoring, humanization processes, and informal mentoring practices in inclusive education. Through the integration of these methods, the study constructed a paradigmatic model of inclusive mentoring that reflects (general truth) its philosophical foundations, organizational culture, pedagogical tools, and strategic functions within the new technological order.

3. RESULTS AND DISCUSSION

The findings of this study highlight that mentoring in inclusive higher education has undergone a significant transformation as societies enter the 22nd technological order. This transformation is closely tied to rapid advancements in nanotechnology, neurotechnology, robotics, and digital ecosystems, all of which reshape pedagogical structures and introduce new demands for flexibility, personalization, and adaptive learning. The analysis demonstrates that mentoring has shifted from an informal, interpersonal transfer of skills to a structured pedagogical system that integrates professional competencies, organizational culture, and socio-emotional support for students with disabilities. This evolution is consistent with contemporary literature that recognizes mentoring as a mechanism for enhancing competence, fostering humanistic education, and strengthening inclusive practices.

A key result of the historical analysis is the identification of 22 technological epochs that mark the progression of human civilisation and shape corresponding shifts in pedagogical activity. Each epoch introduces new technological tools and consequently redefines the roles of teachers, mentors, and learners. In prehistoric technological orders, mentoring functioned

as the principal mechanism for transmitting survival skills. As societies progressed into the Bronze, Iron, and Industrial eras, mentoring expanded to include craft-based knowledge, military training, and industrial competencies. In the current technological age, mentoring must accommodate complex digital, scientific, and organizational knowledge that requires structured methodologies and specialized pedagogical tools. The comparative analysis reveals that the roles of mentors, tutors, curators, and supervisors (although often overlapping) are distinct in their core functions, communication patterns, and pedagogical focus. Mentoring is the only form of pedagogical activity that simultaneously integrates competence development, implicit knowledge transfer, organizational culture formation, and individualized socio-emotional support. This distinguishes mentoring from tutoring, which focuses on academic assistance; curation, which emphasizes administrative oversight; and scientific supervision, which centers on research productivity. The differences among these pedagogical roles are summarized in **Table 1**, which categorizes their main functions, communication modes, and contributions to inclusive education.

Table 1. Comparative characteristics of pedagogical roles in inclusive higher education.

Pedagogical Role	Core Function	Communication Pattern	Primary Focus	Relevance to Inclusion
Mentor	Competence development, organizational culture transfer, and socio-emotional support	Horizontal + vertical	Professional identity formation, personalized guidance	Very high—supports full inclusion and socialization
Tutor	Academic guidance, skill explanation	Mostly horizontal	Course-specific assistance	Moderate—supports personalized learning
Curator	Monitoring performance, discipline, and participation	Vertical	Administrative oversight	Low–moderate
Scientific Supervisor	Guiding research, ensuring progress	Vertical	Research productivity	Moderate for inclusive research mentoring

The results also show that inclusive mentoring requires an expanded set of tools designed to address the cognitive, psychosocial, and professional needs of students with disabilities. These tools include diagnosis of psychophysical conditions, assessment of intellectual development, guidance in research and innovation, moral and psychological support, and structured consultations for personal and professional growth (Dzhaparova, 2021). Unlike traditional mentoring arrangements, inclusive mentoring must additionally ensure accessibility, adapt learning environments, and accommodate diverse learning needs. This reinforces the perspective that inclusive mentoring is not merely a pedagogical technique but an integrated socio-professional system. Another important finding relates to the role of the new technological order in shaping mentoring practices. The rise of smart education, digital ecosystems, and emerging professions has increased the demand for mentoring capable of supporting learners in dynamic environments. The 22nd technological order requires not only new competencies but also the formation of new social institutions that embody inclusive professional culture. In this context, mentors are responsible not only for transferring skills but also for cultivating values, behavioral patterns, and communication norms that enable

graduates to function effectively within technologically advanced and inclusive professional communities.

The discussion also highlights the increasing importance of mentoring as a form of social development management, especially as universities aim to prepare graduates for rapidly shifting labor markets. Social development in modern organizations requires structured mechanisms of support, leadership modeling, and organizational culture transmission; all of which align with the functions of mentoring. This suggests that inclusive mentoring contributes not only to academic success but also to broader socio-economic integration.

Another key outcome of the study is the conceptualization of a four-level model for assessing the quality of inclusive mentoring. This model provides a structured framework for evaluating mentoring outcomes, ranging from immediate educational effects to long-term professional and personal development impacts. The first level focuses on educational quality, including skill acquisition and inclusive academic outcomes. The second level examines the operational characteristics of mentoring, such as duration, format, and scope of mentoring activities. The third level assesses supporting conditions, such as accessibility, institutional policies, and available benefits for mentors and students. The fourth level evaluates long-term ecological impact, including well-being, socialization, career trajectory, and competitiveness of students with disabilities in the labor market.

This multi-level model fills a gap in the literature by providing a holistic tool for measuring the effectiveness of mentoring, especially in inclusive environments where outcomes must account for variability in learner needs and structural barriers. Previous studies have primarily focused on competence development or psychosocial outcomes, but few have integrated environmental, institutional, and long-term professional dimensions. Therefore, the model proposed in this study represents a significant advancement in inclusive mentoring research. The findings further indicate that mentoring in inclusive higher education must be understood as a multidimensional pedagogical construct rather than a singular instructional technique. Its complexity lies in the simultaneous integration of cognitive, professional, communicative, and socio-emotional components. This aligns with contemporary perspectives in inclusive pedagogy, where educators emphasize that effective educational support requires a holistic framework capable of addressing the interconnected needs of students with disabilities. Mentoring, therefore, is positioned not only as a mechanism for knowledge transfer but also as a strategy for empowering learners within culturally, socially, and technologically diverse environments.

One of the critical dimensions revealed through analysis is the role of organizational culture in shaping the success of inclusive mentoring. While traditional higher education often prioritizes subject-based knowledge, inclusive mentoring emphasizes the transmission of professional culture values, behavioral norms, collaborative practices, and implicit knowledge that enable individuals to integrate into professional communities. This reflects the view of researchers who argue that mentoring contributes to forming a “social elevator” for students with disabilities by helping them navigate academic and professional spaces that might otherwise be inaccessible. Within this cultural dimension, mentors act as cultural interpreters, supporting students in understanding the explicit and implicit expectations of their chosen fields. Moreover, the findings show that mentoring contributes significantly to socialization processes in inclusive universities. Students with disabilities often require additional support to engage in collaborative learning, participate in academic communities, and develop professional identities. Mentoring fosters mutual support, reduces feelings of isolation, and enhances confidence by strengthening interpersonal relationships. This type of interpersonal

engagement forms the foundation of inclusive learning ecosystems, where individualized attention and emotional support contribute to sustained academic engagement. Another significant insight relates to the diversification of mentoring forms within inclusive higher education. As the educational landscape evolves, mentoring now encompasses both formal and informal practices. Formal mentoring is typically structured and institutionally supported, while informal mentoring emerges organically among peers, educators, or professionals. Informal mentoring, in particular, has become a vital component of inclusive universities, offering flexible, responsive, and socially embedded support mechanisms. These forms of mentoring complement each other, providing learners with multiple avenues for academic and social growth.

The analysis also identifies horizontal mentoring as a growing trend, particularly within inclusive and collaborative learning contexts. Horizontal mentoring refers to support provided among peers or between individuals at similar status levels, in contrast to the traditional vertical mentor–mentee relationship. This peer-based model encourages shared responsibility, enhances collaborative learning, and democratizes knowledge exchange. It also reduces power imbalances, making mentoring more accessible and less intimidating for students with disabilities. Given the increasing emphasis on teamwork in modern professions, horizontal mentoring aligns strongly with real-world collaborative environments. Furthermore, the findings emphasize that inclusive mentoring must accommodate the dynamic nature of the 22nd technological order, which requires students to develop technological fluency, adaptability, and resilience. Technological progress has accelerated the emergence of new competencies, including digital literacy, interdisciplinary collaboration, systems thinking, and innovation management. Mentors must therefore guide students not only in mastering academic content but also in developing adaptive mindsets capable of responding to rapid technological shifts. This results in a mentoring model that is forward-looking, anticipating future professional demands while supporting current academic needs.

The discussion also highlights the importance of integrating diagnostic and monitoring tools into inclusive mentoring practices. Diagnosing students' psychophysical conditions, intellectual development, and learning preferences allows mentors to design individualized pathways that support academic success and personal development. Such diagnostic approaches are essential for students with disabilities, who may require adjustments in learning environments, communication methods, or instructional materials. By integrating diagnostic tools into mentoring, universities ensure that support systems are proactive, equitable, and aligned with evidence-based pedagogical practices. In addition to diagnostics, mentors must provide targeted support in research training and innovation development. As the 22nd technological order increasingly relies on scientific and digital innovation, students with disabilities must be equipped with opportunities to engage in research, experimentation, and project-based learning. Mentoring enables students to gain confidence in scientific inquiry, participate in research communities, and contribute to innovative projects within their fields. Mentoring in U.S. universities often extends into research mentoring, fostering deeper academic engagement and increased professional competence.

Another important dimension uncovered in the study is the necessity for inclusive mentoring to incorporate psychological and emotional support. Students with disabilities may encounter challenges related to self-esteem, social isolation, discrimination, or anxiety. Mentors provide emotional reinforcement, reassurance, and guidance during periods of academic stress. Mentoring serves a humanizing function in inclusive education by cultivating empathy and fostering respectful educational environments. This psychosocial dimension is critical for sustaining student motivation, resilience, and positive academic identity. The

findings also indicate that inclusive mentoring contributes to building professional readiness and labor market competitiveness. As employers increasingly seek individuals with adaptive skills, inclusive communication abilities, and strong collaborative capacities, mentoring helps prepare students for these expectations. Training in professional culture, workplace behavior, and real-world communication norms equips graduates with the tools needed for successful employment. This is particularly important for students with disabilities, who often face additional barriers in accessing professional opportunities. Through mentoring, universities fulfil their responsibility to promote equitable access to the labor market. Finally, the analysis underscores the importance of viewing mentoring as a strategic institutional practice rather than an isolated pedagogical activity. Universities must establish supportive policies, incentives, and ecosystems that sustain mentoring as a long-term commitment. This includes implementing barrier-free environments, flexible learning schedules, accessible technologies, and recognition systems for mentors. Such systemic support ensures that mentoring is integrated into the organizational culture of the university, enhancing its effectiveness and sustainability. Finally, this study adds new information, especially regarding mentoring system, as reported elsewhere (Glushchenko, 2022; Suleiman *et al*., 2025).

4. CONCLUSION

This study examined the evolving role of mentoring in inclusive higher education within the context of the emerging 22nd technological order. The analysis showed that mentoring has transformed into a multidimensional pedagogical system that integrates competence development, organizational culture transmission, psychosocial support, and individualized guidance for students with disabilities. The differentiation between mentoring and related pedagogical roles highlights its unique contribution to inclusive learning environments. The study also proposed a paradigmatic framework and a four-level quality assessment model that address institutional, operational, and long-term developmental dimensions of mentoring. Overall, the findings underscore the increasing importance of structured, culturally responsive, and technologically relevant mentoring practices to ensure equitable educational and professional outcomes for students with disabilities.

5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

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