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INDIVIDUAL EDUCATIONAL TRAJECTORIES IN HIGHER EDUCATION: PEDAGOGICAL CONDITIONS FOR UNIVERSITY TRANSFORMATION

TRAYECTORIAS EDUCATIVAS INDIVIDUALES EN LA EDUCACIÓN SUPERIOR: CONDICIONES PEDAGÓGICAS PARA LA TRANSFORMACIÓN UNIVERSITARIA

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ABSTRACT:

The transformation of contemporary university education has intensified the need to develop flexible, student-centred models that enable higher education students to construct individual educational trajectories in accordance with their abilities, interests, professional goals, and previous learning experience. The purpose of this study is to identify and theoretically substantiate the pedagogical conditions necessary for designing individual educational trajectories in the context of university transformation, with particular attention to the current Ukrainian higher education framework. The study employed conceptual analysis, comparative pedagogical analysis, content analysis of scholarly publications and policy documents, normative analysis of Ukrainian legislation, and theoretical synthesis. The findings indicate that effective individual educational trajectories require the integration of five interrelated conditions: development of student agency and motivation; creation of a flexible curricular and organisational environment; systematic pedagogical and academic support; digital and informational support; and institutional and regulatory mechanisms. The study argues that individual educational trajectories should not be reduced to elective course selection or individual study plans, as they represent a broader dynamic process of educational choice, reflection, self-regulation, and adjustment of learning pathways. The scientific contribution of the study lies in proposing an integrated framework that connects pedagogical, organisational, digital, and regulatory dimensions of individualisation. The findings may support universities in developing student-centred educational policies and mechanisms for personalised academic development.

Keywords: Individual educational trajectory, Higher education, Student-centred learning, Personalised learning, Flexible learning pathways.

RESUMEN:

La transformación de la educación universitaria contemporánea ha intensificado la necesidad de desarrollar

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modelos flexibles y centrados en el estudiante que permitan al alumnado de educación superior construir trayectorias educativas individuales de acuerdo con sus capacidades, intereses, objetivos profesionales y experiencias previas de aprendizaje. El objetivo de este estudio es identificar y fundamentar teóricamente las condiciones pedagógicas necesarias para el diseño de trayectorias educativas individuales en el contexto de la transformación universitaria, con especial atención al marco actual de la educación superior ucraniana. La investigación empleó el análisis conceptual, el análisis pedagógico comparativo, el análisis de contenido de publicaciones científicas y documentos de políticas educativas, el análisis normativo de la legislación ucraniana y la síntesis teórica. Los resultados indican que las trayectorias educativas individuales eficaces requieren la integración de cinco condiciones interrelacionadas: el desarrollo de la autonomía y la motivación estudiantil; la creación de un entorno curricular y organizativo flexible; el apoyo pedagógico y académico sistemático; el soporte digital e informativo; y los mecanismos institucionales y normativos. El estudio sostiene que las trayectorias educativas individuales no deben reducirse a la selección de asignaturas optativas ni a los planes de estudio individuales, ya que representan un proceso dinámico más amplio de elección educativa, reflexión, autorregulación y ajuste de los itinerarios de aprendizaje. La contribución científica del estudio radica en la propuesta de un marco integrado que articula las dimensiones pedagógicas, organizativas, digitales y normativas de la individualización. Los hallazgos pueden contribuir al desarrollo de políticas educativas universitarias centradas en el estudiante y de mecanismos para el desarrollo académico personalizado.

Palabras clave: Trayectoria educativa individual, Educación superior, Aprendizaje centrado en el estudiante, Aprendizaje personalizado, Itinerarios de aprendizaje flexibles.

INTRODUCTION

Higher education is undergoing profound transformations driven by digitalization, artificial intelligence, changing labor market demands, academic mobility, and the expansion of flexible learning environments. These developments challenge traditional university models based on standardized curricula and uniform learning pathways, encouraging student-centred approaches that recognize individual abilities, interests, experiences, and professional aspirations. Kelo & Iucu (2025) emphasize the importance of student-centred learning within the evolving priorities of the Bologna Process, while Glava et al. (2025) highlight the relevance of quality assurance indicators for supporting its effective implementation in higher education institutions. Similarly, Brekke & Zhang (2024) address flexible learning and teaching as essential dimensions of institutional adaptation to increasingly diverse student needs.

These developments broaden access to international academic collaboration and diversify learning opportunities across geographical and institutional boundaries. Furthermore, MacMahon et al. (2022) underscore the importance of translating self-regulated learning research into educational practice, reinforcing the need to develop students' capacity to plan, monitor, and evaluate their learning. Consequently, universities are increasingly expected to foster learner autonomy, informed decision-making, self-regulation, and lifelong learning through flexible educational opportunities that respond to students' evolving academic and professional needs.

Against this background, individual educational trajectories have emerged as a comprehensive approach to personalizing higher education. Parnikova & Antsupova (2021) examine individual educational trajectories within higher education institutions, providing a conceptual basis for understanding the individualization of students' educational experiences. Rather than being limited to individual study plans or the selection of elective courses, these trajectories encompass flexible curricula, interdisciplinary learning, physical and virtual academic mobility, recognition of prior, non-formal, and informal learning, access to digital educational resources, and continuous adjustment of educational objectives.

Within this broader framework, Ahsan et al. (2023) examine the implementation of micro-credentials in higher education, identifying their relevance to flexible learning opportunities and the recognition of specific competencies. Likewise, the Council of the European Union (2022) establishes a common European approach to micro-credentials aimed at supporting lifelong learning and employability, reinforcing the importance of recognizing learning outcomes acquired through diverse educational experiences. However, the effective implementation of individual educational trajectories requires more than curricular flexibility and formal recognition mechanisms. It depends on the integration of student autonomy, institutional adaptability, systematic academic advising, pedagogical support, and appropriate regulatory frameworks. Within this context, university teachers assume increasingly significant responsibilities as mentors, facilitators, and academic advisers who support students in making informed decisions, evaluating their progress, and constructing coherent educational pathways aligned with their personal interests and professional aspirations.

In Ukraine, the development of individual educational trajectories has acquired particular relevance following recent legislative reforms. The Law of Ukraine "On Education" (Verkhovna Rada of Ukraine, 2017) establishes a legal

foundation for educational choice and personalized learning, while Law of Ukraine No. 3642-IX (Verkhovna Rada of Ukraine, 2024) introduced amendments aimed at strengthening the regulatory framework for individual educational trajectories in higher education. These provisions support greater flexibility in educational programmed design, individual study planning, academic mobility, and the recognition of learning acquired through non-formal and informal educational experiences. Nevertheless, the legal recognition of these opportunities does not automatically guarantee their effective implementation. Persistent limitations in institutional organization, curricular flexibility, digital infrastructure, and academic support may restrict students' ability to exercise meaningful educational choice. Accordingly, the development of individual educational trajectories requires coordinated pedagogical, organizational, technological, and regulatory conditions capable of translating established educational rights into accessible and effective personalized learning opportunities.

A central challenge therefore lies in the discrepancy between formally established educational rights and universities' capacity to translate them into meaningful learning opportunities. Individualization frequently remains limited to elective course selection, while flexible progression, interdisciplinary experiences, academic mobility, personalized guidance, and continuous revision of learning pathways receive uneven institutional support. Addressing this discrepancy requires identifying the pedagogical and organizational conditions that transform individual educational trajectories from administrative provisions into effective mechanisms of student-centred education.

Accordingly, this study aims to identify and theoretically substantiate the pedagogical conditions necessary for designing individual educational trajectories in higher education, while examining the organizational and pedagogical mechanisms required for their effective implementation within the ongoing transformation of Ukrainian universities.

MATERIALS AND METHODS

The study adopted a qualitative, theoretical-analytical design to identify and systematize the pedagogical conditions for developing individual educational trajectories in higher education, particularly in Ukrainian universities. It combined conceptual, comparative pedagogical, documentary, and normative analyses with theoretical synthesis. Individual educational trajectories were understood as dynamic processes integrating student autonomy, curricular flexibility, academic support, digital resources, educational mobility, and continuous adjustment of learning goals.

Research materials comprised three groups of sources: peer-reviewed publications on educational individualization, student autonomy, flexible learning, academic advising, and digital education; European higher education policy documents (European Education and Culture Executive Agency, Eurydice, 2024); and Ukrainian legislation, particularly the Laws "On Education" and "On Higher Education" and Law No. 3642-IX (Verkhovna Rada of Ukraine, 2024). Scholarly publications from 2021 to 2026 were prioritized. Sources were selected according to their relevance to higher education and the analytical dimensions of the study, excluding research unrelated to university education or focused exclusively on isolated technological applications.

Conceptual analysis distinguished individualization, personalized learning, student-centred education, flexible learning pathways, and self-regulated learning. Documentary analysis identified recurring pedagogical and institutional factors, while comparative analysis examined international approaches in relation to Ukrainian higher education. Normative analysis addressed educational rights, institutional responsibilities, and legislative provisions. Theoretical synthesis integrated these findings into a framework of pedagogical conditions.

The analytical framework comprised five interconnected dimensions. The motivational and student agency dimension addressed autonomy, responsibility, goal setting, reflection, and self-regulation, supported by orientation programmers and individual development planning. The curricular and organizational dimension examined elective courses, interdisciplinary learning, flexible study formats, academic mobility, and recognition of prior learning through adaptable curricula and individual study plans. Pedagogical support encompassed mentoring, tutoring, academic advising, feedback, and progress monitoring. The digital and informational dimension considered educational platforms, electronic course catalogues, learning analytics, electronic portfolios, and access to information. Finally, the institutional and regulatory dimension addressed university autonomy, recognition procedures, quality assurance, internal regulations, and implementation of national legislation. These dimensions guided the identification and classification of conditions supporting individual educational trajectories.

The research followed four stages: identification of theoretical foundations and key concepts; classification of the structural components of individual educational trajectories; comparison of international educational approaches with Ukrainian legislation and institutional conditions, particularly the 2024 reforms; and synthesis of the findings into an integrated framework of pedagogical conditions.

A factor was classified as a pedagogical condition when it influenced students' educational decision-making, could be intentionally supported or regulated by universities, and contributed to the continuity, coherence, and personalization of educational trajectories. Accordingly, the analysis considered not only the availability of educational

opportunities but also their integration into an institutional environment supporting informed choice, reflection, and academic development.

The methodological approach distinguished individual educational trajectories from individual study plans and elective course selection by examining their pedagogical, organizational, technological, and regulatory interconnections. This framework enabled analysis of the relationship between legally recognized educational rights and the institutional conditions required for their practical implementation in Ukrainian higher education.

RESULTS AND DISCUSSIONS

The analysis of contemporary research on individualization in higher education identified five complementary perspectives: learner-centred, curricular and organizational, technological, pedagogical, and institutional-regulatory. These perspectives emphasize student autonomy and responsibility, curricular flexibility, digital resources, academic support, and institutional mechanisms. Individual educational trajectories therefore extend beyond personalized or adaptive teaching, encompassing a dynamic process of educational planning, decision-making, self-regulation, reflection, and continuous adjustment of learning pathways.

The first pedagogical condition identified was the development of student agency and motivation. Meaningful individualization requires students to establish educational goals, assess their learning needs, make informed decisions, and assume responsibility for their academic development. Consequently, autonomy must be accompanied by competencies in planning, self-assessment, reflection, and self-regulation rather than being limited to the formal availability of educational choices.

The second condition concerned curricular and organizational flexibility. Individual educational trajectories require elective courses, interdisciplinary opportunities, academic mobility, alternative learning formats, recognition of prior learning, and possibilities for adjusting study pace and progression. In Ukraine, Law No. 3642-IX of 23 April 2024 strengthened this framework by introducing amendments affecting the Law of Ukraine “On Education” (Verkhovna Rada of Ukraine, 2017) and the Law of Ukraine “On Higher Education” (Verkhovna Rada of Ukraine, 2014). Nevertheless, legislative recognition must be accompanied by institutional mechanisms that enable students to exercise these opportunities effectively.

The third condition was systematic pedagogical and academic support. Flexible educational pathways increase the importance of mentoring, tutoring, academic advising, and timely feedback. Teachers consequently assume greater responsibility for facilitating educational decisions, monitoring progress, and connecting academic choices with professional goals. Effective implementation also requires universities to recognize these responsibilities within academic workloads, provide professional development, and establish institutional standards for student guidance.

The fourth condition involved digital and informational support. Accessible information about educational programmers, elective courses, mobility opportunities, and recognition procedures enables students to plan and monitor their trajectories. Digital platforms, learning analytics, and electronic portfolios can facilitate informed decisions and personalized recommendations. However, technological resources cannot replace pedagogical interaction and must be integrated into broader student-centred educational practices.

The fifth condition concerned institutional and regulatory capacity. Universities must establish transparent procedures for educational choice, academic mobility, recognition of non-formal and informal learning, modification of individual study plans, academic advising, and quality assurance. Although Ukrainian legislative reforms have expanded opportunities for individualization, their practical implementation depends on institutional regulations, administrative coordination, and organizational resources.

The findings demonstrated that these five conditions operate interdependently. Student motivation requires meaningful curricular alternatives; flexibility depends on academic guidance; digital resources require pedagogical integration; and educational rights depend on effective institutional procedures. Accordingly, individual educational trajectories should be understood as an integrated model of university education rather than a collection of isolated opportunities. The relationship between the identified pedagogical conditions and their expected educational outcomes is presented in Table 1.

Table 1. Pedagogical conditions for designing individual educational trajectories and their expected outcomes.

Pedagogical condition	Main mechanism	Expected educational outcome
Development of student agency and motivation	Goal setting, reflection, self-assessment, informed educational choice	Increased learner autonomy, responsibility, engagement, and capacity for self-directed learning

Flexible curricular and organizational environment	Electives, interdisciplinary options, mobility, flexible formats, recognition of prior learning	Individualized combination of learning experiences and alignment of education with personal and professional goals
Systematic pedagogical and academic support	Mentoring, tutoring, academic advising, feedback, monitoring of progress	More coherent educational decisions, reduced risk of fragmented choices, improved academic progression
Digital and informational support	Digital platforms, learning analytics, e-portfolios, transparent information systems	Better access to educational options, progress monitoring, and data-informed decision-making
Institutional and regulatory support	University policies, internal procedures, recognition mechanisms, staff development	Sustainable implementation of individual educational trajectories at institutional level

The analysis identified a transition in Ukrainian higher education from individualization based primarily on elective course selection towards a broader model incorporating academic mobility, interdisciplinary learning, recognition of non-formal and informal education, and flexible academic pathways. Although the 2024 legislative reforms expanded opportunities for educational choice, their implementation requires coordination among academic staff, programmed administrators, mobility offices, and quality assurance units. Accordingly, individual educational trajectories are understood as dynamic processes involving planning, implementation, monitoring, and continuous adjustment of learning pathways according to students' academic and professional goals.

These findings are consistent with contemporary research on personalized learning. Fariani et al. (2023) identified the importance of learner characteristics, educational goals, preferences, and technological adaptation, while highlighting the conceptual fragmentation of existing approaches. Similarly, Zhong (2023) examined personalization through learning content, sequencing, and learner readiness. However, individual educational trajectories extend beyond these dimensions by integrating long-term academic planning, institutional opportunities, and professional development. Luketić & Diković (2026) also emphasized the need to distinguish individualized teaching, personalized learning, and adaptive learning. The present study contributes to this distinction by conceptualizing educational trajectories as comprehensive processes in which technological adaptation constitutes only one component.

The development of student agency and motivation emerged as a fundamental condition. Heikkinen et al. (2023) demonstrated that learning analytics can support self-regulated learning through feedback and progress monitoring, although access to information alone does not ensure effective self-regulation. Similarly, the present findings indicate that meaningful educational choice requires goal setting, reflection, self-assessment, planning, and decision-making competencies. Without appropriate preparation and academic guidance, increased autonomy may generate fragmented decisions and inequalities among students with different levels of educational experience and access to institutional resources.

Curricular and organizational flexibility represents another essential condition. Martin & Furiv (2022) identified alternative entry routes, programmers' transfers, recognition of prior learning, and flexible academic progression as components of educational flexibility. These mechanisms are particularly relevant to Ukraine, where the 2024 reforms broadened the legal framework for individual educational trajectories. Nevertheless, effective implementation depends on institutional procedures that enable students to combine educational opportunities across programmers, institutions, and learning formats.

Systematic pedagogical support is equally important. The transition towards flexible educational pathways requires teachers to assume responsibilities as mentors, academic advisers, and facilitators of educational decisions. Universities must therefore recognize advising and tutoring within academic workloads, provide professional development, and establish mechanisms for coordination and feedback. Without institutional support for academic staff, student autonomy may remain a formal principle rather than an effective educational practice.

Digital and informational resources constitute an enabling condition for educational individualization. Alamri et al. (2021) demonstrated the potential of learning technologies to support personalization in blended learning environments. Digital platforms, learning analytics, electronic portfolios, and accessible academic information can facilitate educational planning and progress monitoring. However, their effectiveness depends on pedagogical integration, institutional flexibility, and students' capacity to interpret available information. Digital transformation should therefore complement rather than replace academic guidance and human pedagogical judgement.

Institutional and regulatory capacity connects the remaining conditions. Universities require transparent procedures for academic mobility, recognition of prior learning, modification of study plans, quality assurance, and interdisciplinary participation. These mechanisms demand coordination among academic departments, administrative services, programmed coordinators, and university management. In the Ukrainian context, the expansion of educational rights

following the 2024 reforms must be accompanied by institutional arrangements that ensure their accessibility and practical application.

The findings demonstrate that the five pedagogical conditions are interdependent. Student agency requires meaningful curricular alternatives; flexibility depends on academic guidance; digital resources require pedagogical integration; and legal rights depend on institutional implementation. Consequently, individual educational trajectories should be conceived as an integrated model of university education rather than as isolated personalization measures. Unlike individual study plans, which primarily establish the formal sequence of academic activities, educational trajectories incorporate continuous decision-making, reflection, adjustment, and coordination between academic opportunities and professional aspirations.

This integrated perspective also raises questions of equity and inclusion. Flexible educational opportunities may reproduce inequalities when access to information, mentoring, mobility, or digital resources differs among students. Furthermore, artificial intelligence applications introduce challenges concerning transparency, algorithmic bias, data protection, and dependence on automated recommendations. Universities must therefore ensure equitable access to educational support while preserving student autonomy and human oversight.

The principal theoretical contribution of the study is the integration of pedagogical, curricular, technological, and regulatory dimensions into a unified framework for understanding individual educational trajectories. Its practical relevance lies in supporting institutional policies that connect educational choice with academic advising, flexible curricula, digital infrastructure, and regulatory mechanisms. Nevertheless, the proposed framework derives from theoretical, documentary, and normative analysis rather than empirical data collected from students or university staff. Future research should evaluate these conditions across institutions and disciplines, examining their relationships with academic progression, student satisfaction, autonomy, employability, and educational persistence. Comparative studies involving Ukrainian and other European universities could further establish the applicability of the framework across different institutional contexts.

CONCLUSIONS

The analysis identified five interrelated pedagogical conditions that are essential for the effective design of individual educational trajectories. The first is the development of student agency and motivation, which enables learners to define educational goals, make informed choices, reflect on their progress, and assume responsibility for their educational decisions. The second is the creation of a flexible curricular and organisational environment that provides access to elective components, interdisciplinary learning, academic mobility, flexible learning formats, and mechanisms for recognising prior, non-formal, and informal learning. The third condition is systematic pedagogical and academic support through mentoring, tutoring, academic advising, feedback, and monitoring of student progress. The fourth is the availability of a developed digital and informational environment that ensures transparency of educational opportunities and supports planning, monitoring, and adjustment of individual learning pathways. The fifth is institutional and regulatory support, including university policies, internal procedures, quality assurance mechanisms, staff development, and the effective implementation of national legislation.

The aforementioned conditions should not be implemented separately. Their effectiveness depends on their integration into a coherent institutional model. Student motivation without meaningful educational alternatives cannot produce genuine individualization; curricular flexibility without academic guidance can lead to fragmented choices; digital tools without pedagogical support cannot ensure informed decision-making; and legal guarantees without corresponding university procedures may remain merely declarative. Therefore, individual educational trajectories must be integrated into the overall architecture of university education rather than introduced as isolated organizational instruments.

The study also confirms that the concept of an individual educational trajectory is broader than the concepts of personalised learning, adaptive learning, or an individual study plan. While these approaches focus primarily on specific aspects of the educational process, the individual educational trajectory encompasses long-term educational planning, learner autonomy, flexible curriculum design, recognition of diverse learning experiences, academic mobility, reflection, and continuous adjustment of educational choices. This broader interpretation contributes to the theoretical development of the concept of individualisation in higher education.

The Ukrainian context gives particular relevance to these conclusions. The legislative changes introduced in 2024 significantly expanded the regulatory basis for individual educational trajectories and created new opportunities for students to exercise educational choice. However, the study shows that the practical effect of these reforms will depend on the capacity of higher education institutions to transform formal legal possibilities into transparent, accessible, and pedagogically meaningful mechanisms. In this respect, the current stage of reform should be viewed as a transition from the legal recognition of individual educational trajectories to their institutional and pedagogical operationalisation.

The scientific novelty of the study lies in the development of an integrated conceptual framework that combines student agency, curricular flexibility, pedagogical support, digital infrastructure, and institutional regulation within a single model of individual educational trajectory design. This framework responds to the fragmentation identified in contemporary research on individualisation, personalised learning, self-regulated learning, and flexible educational pathways.

The practical significance of the results lies in their potential application in the development of educational programmes, individual study planning mechanisms, academic advising and tutoring systems, procedures for recognising non-formal and informal learning, digital tools for educational planning, and institutional policies aimed at strengthening student-centred education. The proposed framework may also be used by higher education institutions as an analytical tool for assessing the extent to which existing educational opportunities genuinely support individualisation.

At the same time, the study has certain limitations. Its conclusions are based primarily on theoretical, comparative, and normative analysis rather than on large-scale empirical data collected from students, academic staff, or university administrators. Therefore, future research should empirically test the identified pedagogical conditions in different types of higher education institutions and academic disciplines. Further studies should also examine students' perceptions of educational choice, the effectiveness of academic advising, the role of digital and artificial intelligence tools in educational trajectory design, and the relationship between individual educational trajectories, academic success, employability, and lifelong learning.

Overall, the results indicate that the development of individual educational trajectories constitutes an important direction for the transformation of contemporary university education. Their effective implementation can strengthen student-centred learning, increase institutional flexibility, support learner autonomy, and create more favourable conditions for aligning higher education with the diverse educational and professional needs of students.

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CONFLICTS OF INTEREST:

The authors declare that there are no conflicts of interest.

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- **Nadiya Slyusar:** Conceptualization, Methodology, Writing – Original Draft
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- **Halyna Butenko**: Formal Analysis, Validation.
- **Yuliia Teteriuk-Kinch:** Methodology, Formal Analysis.
- **Kateryna Dmytrenko**: Writing – Review & Editing, Data Curation.

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