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CLUSTERING ANALYSIS OF UKRAINIAN HIGHER EDUCATION INSTITUTIONS BY INCLUSIVITY LEVEL

Svitlana Tsymbaliuk,[1]
Professor, Doctor of Science,
Kyiv National Economic University named after Vadym Hetman,
Institute of Higher Education of the National Academy of Educational Sciences of Ukraine

tsymbaliuk.svitlana@kneu.edu.ua
ORCID: 0000-0002-6194-4035

Olena Orzhel,[2]
Lead Researcher, Doctor of Sciences,
Institute of Higher Education of the National Academy of Educational Sciences of Ukraine

o.orzhel@ihed.org.ua
ORCID: 0000-0001-9912-0173

Nataliia Shofolova,[3]
Associate Professor, PhD in Finance,
Institute of Higher Education of the National Academy of Educational Sciences of Ukraine

nataliia.shofolova@gmail.com
ORCID: 0000-0002-6654-6765

Abstract. *The aim of this study is to analyse the implementation of inclusive policies and practices in Ukrainian HEIs and to cluster them based on inclusivity levels. Data were collected from May to July 2025 using a structured questionnaire distributed via Google Forms to 821 respondents, including students, faculty, and administrative staff across various HEIs. A quantitative analysis of 34 closed-ended questions (Cronbach's alpha = 0.944), followed by quartile-based cluster analysis using an aggregated inclusivity indicator (P_{inc}). The overall proportion of affirmative ("yes") responses was 56.6%. Identified strengths include flexible learning formats, diverse methods for demonstrating knowledge, and quota systems for socially vulnerable groups. However, significant gaps exist in information accessibility for individuals with disabilities, faculty professional development in inclusive education, and the provision of adapted learning materials. Private and communal HEIs outperform state-owned institutions. Pedagogical HEIs lead with 67.1% of affirmative responses, followed by classical (59.7%), medical (55.2%), and technical (50.4%) institutions, reflecting sectoral differences. Clustering identified three groups based on inclusivity levels: low ($P_{inc} \leq 21$), medium ($21 < P_{inc} < 30$), and high ($P_{inc} \geq 30$). These groups were influenced by funding, staff training, and monitoring systems. The findings justify targeted support for HEIs with low inclusivity scores and the dissemination of best practices from high-performing institutions. Policy priorities include increased funding for barrier-free environments and adapted materials, mandatory*

[1] Corresponding author, responsible for conceptualisation, methodology, data curation, validation, formal analysis, writing – original draft, supervision.
[2] Co-author, responsible for investigation, data curation, validation, writing – review & editing.
[3] Co-author, responsible for investigation, resources, visualisation, writing - review & editing.

staff training, and national monitoring of inclusivity. Future research should develop longitudinal indicators and explore the impact of inclusive practices on the social integration and rehabilitation of veterans and displaced persons.

Keywords: *social inclusion, higher education institutions (HEIs), inclusivity, cluster analysis, barrier-free education, wartime challenges, vulnerable student groups*

1. INTRODUCTION

The development of higher education systems is closely linked to the implementation of social inclusion principles, ensuring equal access to quality education for all students regardless of their social background, health status, or other characteristics. At the international level, inclusivity is recognised as a key priority for higher education development. Ukraine, having declared its strategic course toward European Union membership, is obliged to align its higher education system with European standards and values, where inclusion occupies a central place. This commitment is enshrined in the Strategy for the Development of Higher Education in Ukraine for 2022–2032, which identifies accessibility, equity, and diversity as priorities. The issue of social inclusion has gained particular urgency due to the full-scale war in Ukraine, which has given rise to new categories of students, including internally displaced persons, veterans, individuals with disabilities, and those who have experienced physical or psychological trauma. Mass population displacement, health challenges, and the growing number of individuals with special educational needs have significantly complicated access to higher education, necessitating the creation of flexible, barrier-free, and supportive environments by higher education institutions (HEIs). Thus, establishing an inclusive educational space in Ukraine today is not only a response to international obligations but also an urgent condition for societal recovery and development during wartime. This underscores the need for a comprehensive study of the current state of social inclusion in HEIs and the development of effective implementation strategies.

The issue of social inclusion in higher education is addressed in the papers of various researchers, who emphasise the necessity of ensuring equal access to quality education for all students, regardless of their social, physical, or cultural characteristics. The concept of inclusion is interpreted differently across studies, with varying conceptual aspects (Korthals Altes et al., 2024). Nevertheless, a general trend is observed toward expanding its meaning – from a narrow focus on educating individuals with special educational needs to a broader approach that creates equal opportunities for every student at risk of educational exclusion (Symeonidou, 2017; Severiens et al., 2013; Callan, 2020; Stentiford & Koutsouris, 2020; Korthals Altes et al., 2024).

Researchers highlight that education serves as an effective tool for overcoming societal stereotypes, promoting social inclusion (Singal et al., 2015), and strengthening equity in society (Korthals Altes et al., 2024). Advocates of this approach (Ainscow, 2020; Rosado-Castellano et al., 2022) argue that implementing inclusion principles enhances the quality of educational services, fostering a more resilient and equitable learning environment.

In the Ukrainian academic discourse, considerable attention is given to the heightened relevance of social inclusion in the context of the full-scale war (Hurenko et al., 2023). Nesterova and Orzhel (2023) view inclusion as a foundation for rebuilding educational communities and maintaining social cohesion. A similar view is supported by Udych et al. (2025), who emphasise human-centeredness as a philosophy of inclusive approaches. Morus (2025) expands on this perspective by stating that inclusion is not only about access to education, but also about creating the conditions for every student to unlock their potential. At the same time, Claeys-Kulik et al. (2019) interpret inclusion as a tool for shaping a university's social profile, aligning with societal values and fostering a sense of belonging among students.

Despite the development of inclusive policies, their effective implementation remains challenging (Martins et al., 2017; Perera-Rodríguez & Moriña Díez, 2017; Gonzalo et al., 2024; Filippou et al., 2025; Oswal et al., 2025; Mapuya, 2025). The most significant barrier is the inadequate preparedness of faculty to work with individuals with special needs (Moriña, 2017; Korthals Altes et al., 2024). This is compounded by a low level of knowledge regarding interaction practices with students with disabilities (Núñez Nogueroles & Freire, 2025) and the absence of individualised education plans (Rashid & Wong, 2023). Physical inaccessibility of university spaces, a lack of specialised transportation and resources (Milic Babic & Dowling, 2015; Yusof et al., 2019; Zabeli et al., 2021; Korthals Altes et al., 2024), and communication barriers (Moriña & Morgado, 2016) significantly limit the inclusivity of educational environments.

A significant number of studies underscore the importance of educational policies (Magnússon et al., 2019; Salmi & D'Addio, 2020) and effective educational management and leadership (Martinez-Acosta & Favero, 2018; Nikolaesku et al., 2021; López-López et al., 2022; Hogenes, 2025). Key solutions to overcome barriers include establishing support offices (Yusof et al., 2019), developing barrier-free educational spaces (Milic Babic & Dowling, 2015; Webb & Thi Ngoc Ha, 2024), integrating digital technologies (Pacheco et al., 2020), and providing training programs on inclusive practices for academic and non-academic staff (Collins et al., 2018; McEwen et al., 2024; Hogenes, 2025; Korkie et al., 2025). Initiatives to enhance inclusivity are impossible without the engagement of all educational stakeholders (Iniesto & Bossu, 2023). Additionally, there is a need to foster a culture of responsibility (Gerdes et al., 2020; Zorec et al., 2022), raise awareness about disability (Milic Babic & Dowling, 2015), and promote positive value orientations (Zabeli et al., 2021).

Another research dimension concerns the cultural aspect of the educational environment, where students should feel competent and valued regardless of their individual characteristics or challenges (Fernández-Batanero et al., 2022). Innovative inclusive learning technologies have demonstrated their ability to boost student motivation, enhance educational engagement, and improve relationships between faculty and students (Castellano-Beltran et al., 2025).

Despite the substantial amount of research dedicated to the conceptual foundations and practical aspects of social inclusion in higher education, the tools for its quantitative measurement and comparison of inclusivity levels across institutions remain underexplored. The scientific literature lacks approaches to systematising and comparing universities by

this criterion, particularly in countries experiencing war or social disruption. In the Ukrainian context, where the war creates additional vulnerable learner groups and sharpens the challenge of rebuilding educational communities, analysing the inclusivity levels of HEIs gains not only scientific but also socio-practical significance. Therefore, clustering institutions based on inclusivity indicators represents a promising research direction, capable of not only identifying the strengths and weaknesses of institutions but also laying the basis for developing effective educational policies and management decisions in Ukraine's higher education sector.

The aim of the study was to analyse the implementation of inclusive policies and practices in Ukrainian HEIs and to conduct their clustering based on the level of inclusivity. To achieve this aim, the following objectives were set: 1) collect data on the state of inclusive practices in HEIs; 2) assess differences across ownership forms, types, and sizes of institutions; 3) identify groups of institutions with similar inclusivity profiles using cluster analysis.

The following research hypotheses were tested:

H1. Private and communal HEIs demonstrate significantly higher levels of inclusivity than state-owned institutions due to greater financial and organisational flexibility.

H2. Pedagogical HEIs achieve higher inclusivity scores than technical and medical HEIs because of their stronger focus on social and humanitarian aspects of education.

H3. The level of inclusivity is positively associated with the availability of dedicated funding, systematic staff training in inclusive practices, and the existence of institutional monitoring and reporting mechanisms.

The achievement of the stated aim and objectives, as well as the verification (or rejection) of the hypotheses, will enable not only an assessment of the current state of inclusivity of higher education in Ukraine but also the proposal of targeted measures for its development under wartime conditions.

2. METHODS

The study employed quantitative analysis of responses to closed-ended questions to identify key challenges and provide suggestions for the development of inclusive policies and practices in Ukrainian HEIs.

Data were collected using a structured questionnaire developed based on the literature review and national inclusion strategies (Ministry of Education and Science of Ukraine, 2022; Verkhovna Rada of Ukraine, 2021). The questionnaire consisted of 34 closed-ended questions covering various aspects of implementing the priority of social inclusion, with response options "yes," "no," and "difficult to answer." The questions addressed institutional policies, barrier-free environments, financial support, adaptation programs, information accessibility, and student support. Demographic data include gender, age, position/role, institution type, ownership form, region, and student numbers.

The questionnaire was pilot tested with a group of 20 respondents to ensure the clarity of the questions. The reliability of the closed-ended questions scale was assessed using Cronbach's alpha ($\alpha = 0.944$), indicating high internal consistency.

The survey was conducted from May to July 2025 via Google Forms among academic staff, heads of structural units, and higher education students from various HEIs

across Ukraine (Table 1). A total of 821 respondents participated. The sample was formed using a stratified method to ensure representation of different types and ownership forms of HEIs. Among the respondents, 68.8% were female, and 30.1% were male, reflecting the gender structure of the higher education sector. By age: 38.2% were under 21 years (mostly students), 40.6% were aged 36–60 years (mostly faculty), and 13.9% and 7.3% belonged to 22–35 and over 60 years age groups, respectively. By role, 48.2% were students, 37.0% were academic staff, 8.0% were the head of the structural unit, and 6.8% held other positions and roles. By institution type, classical universities accounted for 32.8%, technical institutions for 23.0%, pedagogical institutions for 10.0%, medical institutions for 9.6%, humanities institutions for 7.8%, economics institutions for 6.9%, and other types for 9.9%. By ownership form: 86% were state-owned, 7.9% were private, and 6.1% were communal. Geographically, Kyiv dominated with 47.3% of respondents, followed by the Dnipropetrovsk region with 24.8%. By size, 19.9% represented large HEIs (with over 10,000 students), while 27.6% of respondents did not specify the exact student number, possibly indicating a lack of awareness of the exact student number.

Table 1. Socio-demographic characteristics of the respondents (N = 821)

Characteristic	% of respondents
Gender	
Female	68.8
Male	30.1
Prefer not to say	1.1
Age	
Under 21 years	38.2
22–35 years	13.9
36–60 years	40.6
Over 60 years	7.3
Position / role	
Rector / Vice-rector	1.3
Head of the structural unit	8.0
Academic staff (professor, associate professor, lecturer, assistant)	37.0
Research staff	1.9
Postgraduate student	0.7
Student	48.2
Other	2.9
Type of HEI	
Classical	32.8
Humanities	7.8
Economics	6.9
Medical	9.6
Pedagogical	10.0
Technical	23.0
Other	9.9
Ownership form	
State-owned	86.0
Communal	6.1
Private	7.9
Region of location of the HEI	
Volyn region	2.8
Dnipropetrovsk region	24.8
Zaporizhzhia region	4.4
Ivano-Frankivsk region	3.7
Kyiv region	5.8

Characteristic	% of respondents
City of Kyiv	47.3
Lviv region	2.8
Kherson region	2.2
Other regions	6.2
Number of students in the HEI	
≤ 2,999	25.5
3,000–9,999	27.0
≥ 10,000	19.9
Do not know / no answer	27.6

The representativeness of the sample is limited by the predominance of state-owned institutions and their concentration in two regions, a factor that is taken into account when interpreting the results.

For data analysis, the following quantitative methods were applied:

- Descriptive analysis was used to describe the sample and characteristics of inclusive practices (frequencies, percentages, means, standard deviations);
- Quartile-based clustering was applied to group HEIs by an aggregated inclusivity indicator (P_{inc}), calculated as the sum of scores for the 34 questions. Text responses were recoded as follows: “yes” = 1, “no” = 0, “difficult to answer” = 0.5;
- A ranking method was employed to identify strong (high percentage of “yes” answers) and weak (high percentage of “no”) aspects of inclusion.

For clustering, a quartile method (Q1, Q3) was used to define low, medium, and high levels of inclusivity.

The study was conducted in accordance with ethical principles, ensuring anonymity and voluntary participation, and informed consent was obtained from all respondents.

3. RESULTS

The aim of the present study was to analyse the current state of implementation of inclusive policies and practices in Ukrainian HEIs and to cluster these institutions according to their level of inclusivity. To achieve this aim, data were collected between May and July 2025 through a structured questionnaire completed by 821 respondents (students, academic staff, and administrative personnel) representing a wide range of Ukrainian HEIs. The instrument comprised 34 closed-ended items (Cronbach’s α = 0.944) that assessed multiple dimensions of inclusivity: institutional policies and leadership, barrier-free environments, financial and admission support mechanisms, adaptation of curricula and teaching methods, information accessibility, professional development of staff, monitoring and reporting practices, and support for vulnerable student groups.

The state of implementation of inclusive policies and practices in Ukrainian HEIs

The survey provided a comprehensive snapshot of the current level of implementation of inclusive policies and practices across Ukrainian higher education institutions (HEIs) as perceived by students, academic staff, and administrators in mid-2025. Out of the 34 closed-ended items that measured various dimensions of inclusivity, the mean positive response rate (“yes”) was 56.6%, with 8.8% negative responses (“no”) and 34.6% “difficult to answer”. The relatively high proportion of “difficult to answer” responses points

to limited awareness or the absence of institutional monitoring mechanisms in a considerable number of HEIs.

The highest scores were recorded for the use of flexible learning formats (88.7% positive responses), opportunities for demonstrating knowledge in various ways (82.6%), and the quota system for budget-funded places for socially vulnerable groups (79.0%). These figures reflect a significant emphasis on flexibility and student support, likely partly due to digitalisation and adaptation to modern challenges related to the war.

However, there are problematic areas where the implementation of inclusive practices lags. The lowest score (only 32.2% positive responses) was recorded for the availability of information about the institution for individuals with disabilities or in languages other than Ukrainian. Professional development programs for faculty in inclusive education (35%) and teaching in multicultural environments (37%) have not been widely adopted. The effective realisation of institutional inclusion policies is hindered by the absence of a designated responsible person, with only one-third of respondents indicating the presence of such a role in their institutions. The practice of creating adapted learning materials and assistive devices to provide educational services to individuals with special educational needs is also insufficiently widespread, with 41.3% of respondents providing positive responses. These data point to a lack of staff training and institutional mechanisms, complicating the systematic implementation of inclusive practices.

Comparison of social inclusion policies and practices across HEIs with different ownership forms

The analysis of survey results reveals that the private HEIs achieved the highest overall positive response rate (68.7%), followed by communal (67.2%) and state-owned institutions (54.6%) (Table 2).

Table 2. Comparison of social inclusion policies and practices across HEIs with different ownership forms

Policies and Practices	State (Yes, %)	Private (Yes, %)	Communal (Yes, %)
1. Institutional inclusion policy	60.4	79.7	72.0
2. Reporting on inclusion implementation	36.0	48.4	60.0
3. Quotas for budget-funded places for socially vulnerable students (SVSs)	81.3	57.8	74.0
4. Financial support (grants, scholarships, loans) for SVSs	68.9	65.6	66.0
5. Funding for barrier-free educational spaces	43.2	65.6	66.0
6. Barrier-free educational spaces	52.7	75.0	74.0
7. Provision of necessary resources (food, textbooks, etc.) for SVSs	40.5	54.7	36.0
8. Accessibility of information for individuals with disabilities or in non-Ukrainian languages	29.2	56.3	40.0
9. Non-discriminatory and gender-sensitive language	49.0	56.3	60.0
10. Individual educational trajectories	64.8	79.7	74.0
11. Adapted materials and assistive devices for students with special educational needs	37.6	71.9	52.0
12. Professional development of faculty in inclusive education	32.2	54.7	44.0
13. Professional development of faculty in multicultural teaching	34.3	59.4	44.0
14. Professional development of faculty in student-centred methods	47.3	60.9	48.0
15. Faculty self-assessment regarding ability to use inclusive teaching methods	36.0	62.5	40.0

Policies and Practices	State (Yes, %)	Private (Yes, %)	Communal (Yes, %)
16. Leadership awareness of inclusion issues	53.6	81.3	70.0
17. Designated person responsible for inclusive education	29.9	59.4	42.0
18. Measures for inclusion implementation and anti-bullying	61.3	75.0	82.0
19. Measures for mental health preservation	71.2	81.3	88.0
20. Engagement of student self-governance in inclusion	56.7	68.8	70.0
21. Sense of safety for students with special needs and diverse characteristics	61.7	76.6	86.0
22. Educational modules on diversity and inclusion	50.9	76.6	74.0
23. Academic events on inclusion and equity	56.6	78.1	82.0
24. Engagement of students with special needs in activities	63.0	81.3	86.0
25. Flexible learning formats	87.9	92.2	96.0
26. System for recognising results of inclusive mobility and non-formal learning	62.5	59.4	54.0
27. ECTS credits for volunteer and civic activities	46.9	35.9	52.0
28. Diverse ways of information presentation by faculty	64.1	68.8	84.0
29. Diverse ways of knowledge demonstration by students	81.1	84.4	100.0
30. Special tools and technologies for students with special needs	65.2	76.6	80.0
31. Psychological support for students	68.2	76.6	82.0
32. Blended mobility and internationalisation at home programs	55.0	68.8	64.0
33. Presence of students with special needs	47.3	65.6	60.0
34. Participation of students with special needs in scientific events	60.4	79.7	82.0
Average	54.6	68.7	67.2

An analysis of data reveals variations in the adoption of inclusive practices, reflecting both strengths and weaknesses. Private HEIs demonstrate the highest average score in implementing inclusive policies and practices (68.7%). They outperform other institution types in creating inclusive barrier-free educational spaces (75%), providing adapted materials and assistive devices for students with special educational needs (71.9%), and offering training for academic staff in inclusive education (54.7%). In private HEIs, the presence of a designated person responsible for inclusive education is more common (59.4%). These results may be attributed to greater financial flexibility and an innovation-oriented approach.

Communal HEIs also demonstrate a higher average level of inclusive practice implementation (67.2%) compared to state institutions, showing better performance in using flexible learning formats (96%), offering diverse ways to demonstrate knowledge (100%), and employing special tools and technologies, including digital ones, for students with special educational needs (80%). This indicates their ability to adapt to the needs of diverse groups.

State HEIs have the lowest average score (54.6%), though they lead in the quota system for budget-funded places (81.3%) and the provision of grants, scholarships, and loans for socially vulnerable students (SVSs) (68.9%), ensuring broader access to education for vulnerable categories. State institutions also have more experience in recognising (crediting) results of inclusive mobility and non-formal learning (62.5%). However, they significantly lag in areas such as information accessibility for individuals with disabilities (29.2%), the provision of adapted learning materials (37.6%), transparency in reporting on inclusion implementation (36%), and the implementation of professional development programs in inclusive education for faculty (32.2%). These shortcomings may be linked to

limited funding and insufficient attention to the systematic implementation of inclusive practices.

Among the common strengths across all HEI types are high levels of flexibility in learning, active measures to counteract bullying and preserve students' mental health, and opportunities for demonstrating knowledge in various ways. However, weaknesses include low accessibility of information for individuals with special needs, limited use of non-discriminatory and gender-sensitive language, and the awarding of ECTS credits for volunteer and civic activities. The widespread absence of a designated officer responsible for inclusion (particularly in state-owned HEIs) and the limited adoption of systematic monitoring and reporting practices highlight critical deficiencies in the institutional frameworks required to sustain and advance social inclusion policies.

Comparison of social inclusion policies and practices across HEIs of varying sizes

The findings indicate that the implementation of inclusive practices in HEIs of different sizes shows both common features and certain distinctions (Figure 1). Overall, the average inclusivity scores are relatively close: 60.4% for small institutions (encompassing up to 3,000 students), 59.1% for medium-sized institutions (with 3,000–10,000 students), and 57.8% for large institutions (with over 10,000 students).

Small HEIs (up to 3,000 students) more frequently implement inclusive practices, such as providing psychological support (77.5%), utilising special tools and technologies for individuals with special needs (73.7%), and actively engaging students with special needs in activities (71.8%). This can be explained by more flexible management and closer contact with students in a smaller institution.

Medium-sized HEIs (3,000–10,000 students) demonstrate stronger performance in implementing modules (courses, topics, or thesis subjects) related to diversity, inclusion, equal opportunities, and non-discrimination (58.1%), as well as in organising various events addressing these issues (63.1%) and engaging students with special educational needs in scientific events (66.7%).

Large HEIs (those with over 10,000 students) lead in the quota system for budget-funded places (87.1%) and the provision of grants and scholarships for SVSs (78.5%), likely due to their greater resources and state support. The analysis also indicates that a larger proportion of large HEIs (57.7%) have students with special educational needs.

The highest scores across all institutions are observed in the use of flexible learning formats and the provision of opportunities to demonstrate knowledge in various ways, indicating the adaptability of the educational process regardless of institution size. However, common weaknesses include low accessibility of information for individuals with disabilities and limited professional development programs in inclusive education for faculty.

Figure 1. Comparison of social inclusion policies and practices across HEIs of varying sizes

Comparison of social inclusion policies and practices across different types of HEIs

The data reveal that pedagogical HEIs demonstrate the highest average score in implementing inclusive practices (67.1%), reflecting their orientation toward social and humanitarian aspects of education (Table 3). Classical HEIs, with an average score of 59.7%, demonstrate a balanced approach due to their broad profile, enabling the implementation of diverse practices. Medical (55.2%) and technical (50.4%) HEIs lag in adopting inclusive practices, possibly due to their specialisation, which is less focused on social issues.

Pedagogical HEIs demonstrate a high level of integration of modules on diversity and inclusion into educational programs (82.9%), the organisation of mental health initiatives (82.9%), inclusion and diversity events (79.3%), and engagement of student self-governance (75.6%). Although pedagogical HEIs outperform others in these areas, challenges remain regarding information accessibility (41.5%) and the appointment of responsible persons (47.6%), likely due to limited funding.

Classical HEIs demonstrate strengths in the quota system for budget-funded places (80.5%), the provision of grants and scholarships for SVSs (74.6%), and the engagement of students with special needs in diverse activities (72.4%). However, their weaknesses include a reporting system (39.7%) and the institutionalisation of responsibility for implementing inclusive policies and practices (32%).

Medical HEIs effectively utilise flexible learning formats (91.1%), special technologies for individuals with special needs (77.2%), and diverse methods of information presentation by faculty, considering students' characteristics (74.7%), primarily due to the specific students' cohort (e.g., presence of international students) and the organisation of the educational process. However, medical HEIs significantly lag in creating barrier-free educational spaces (45.6%) and implementing professional development programs for faculty in inclusive education (32.9%).

Table 3. Comparison of social inclusion policies and practices across different types of HEIs

Policies and Practices	Classical (Yes, %)	Technical (Yes, %)	Pedagogical (Yes, %)	Medical (Yes, %)
1. Institutional inclusion policy	63.6	61.6	69.5	57.0
2. Reporting on inclusion implementation	39.7	36.8	56.1	29.1
3. Quotas for budget-funded places for SVSs	80.5	76.3	80.5	77.2
4. Financial support for SVSs	74.6	65.3	63.4	73.4
5. Funding for barrier-free educational spaces	49.6	42.1	61.0	35.4
6. Barrier-free educational spaces	58.8	55.3	64.6	45.6
7. Provision of necessary resources for SVSs	40.1	36.8	51.2	50.6
8. Accessibility of information for individuals with disabilities or in non-Ukrainian languages	37.5	20.5	41.5	36.7
9. Non-discriminatory and gender-sensitive language	57.7	37.4	58.5	43.0
10. Individual educational trajectories	71.7	60.5	72.0	54.4
11. Adapted materials and assistive devices for students with special educational needs	43.4	34.7	51.2	35.4
12. Professional development of faculty in inclusive education	39.3	25.8	51.2	32.9
13. Professional development of faculty in multicultural teaching	37.1	28.4	52.4	38.0

Policies and Practices	Classical (Yes, %)	Technical (Yes, %)	Pedagogical (Yes, %)	Medical (Yes, %)
14. Professional development of faculty in student-centred methods	51.8	41.1	64.6	45.6
15. Faculty self-assessment regarding ability to use inclusive teaching methods	41.2	33.7	46.3	39.2
16. Leadership awareness of inclusion issues	60.3	49.5	74.4	63.3
17. Designated person responsible for inclusive education	32.0	32.1	47.6	31.6
18. Measures for inclusion implementation and anti-bullying	64.3	60.5	74.4	65.8
19. Measures for mental health preservation	77.9	65.8	82.9	64.6
20. Engagement of student self-governance	61.8	54.2	75.6	50.6
21. Sense of safety for students with special needs and diverse characteristics	65.1	54.7	78.0	69.6
22. Educational modules on diversity and inclusion	62.1	35.3	82.9	50.6
23. Academic events on inclusion and equity	63.6	46.8	79.3	59.5
24. Engagement of students with special needs in activities	72.4	59.5	73.2	69.6
25. Flexible learning formats	90.1	86.3	89.0	91.1
26. System for recognising results of inclusive mobility and non-formal learning	63.6	68.4	73.2	51.9
27. ECTS credits for volunteer and civic activities	51.5	41.6	53.7	46.8
28. Diverse ways of information presentation by faculty	69.9	59.5	72.0	74.7
29. Diverse ways of knowledge demonstration by students	84.9	77.9	86.6	83.5
30. Special tools and technologies for students with special needs	68.8	60.0	72.0	77.2
31. Psychological support for students	71.7	63.2	79.3	67.1
32. Blended mobility and internationalisation at home programs	58.1	48.9	68.3	62.0
33. Presence of students with special needs	55.9	39.5	64.6	39.2
34. Participation of students with special needs in scientific events	69.5	54.2	70.7	64.6
Average	59.7	50.4	67.1	55.2

Note: For comparison, a sample was formed including classical, technical, pedagogical, and medical HEIs, which had the highest participation of staff and students in the survey

The adoption of flexible learning formats in medical HEIs (91.1%) is primarily driven by the necessity to ensure continuity of theoretical and pre-clinical education during the full-scale war, when many clinical bases became inaccessible, and both students and faculty were frequently displaced or faced constant security threats.

Technical HEIs show the lowest performance, particularly in information accessibility (20.5%) and faculty professional development programs (25.8%), as well as the inclusion of modules (courses) addressing diversity, inclusion, and equal opportunities (35.3%), although they achieve some success in adopting flexible learning formats (86.3%). Their technical focus and limited resources explain this lag. Additionally, a contributing factor may be the low percentage of technical HEIs with students with special educational needs (39.5%) and the limited knowledge of institutional leaders regarding inclusive education (49.5%).

Common achievements across all HEI types include a high level of utilisation of flexible learning formats, which ensures adaptability to student needs, opportunities to demonstrate knowledge in various ways, and the organisation of initiatives focused on mental health and anti-bullying. However, all institutions face gaps in information

accessibility for individuals with disabilities, reporting practices, and professional development programs for faculty in inclusive education. These issues stem from insufficient funding, low awareness and/or motivation, and inadequate attention to the social aspects of institutional activities.

Clustering of HEIs by inclusivity level

To construct clusters, the calculated aggregated inclusivity indicators (P_{inc}) for each respondent were used. The ranges of clusters were determined using descriptive statistics tools and the quartile method.

The statistical analysis of the aggregated inclusivity indicator (P_{inc}) for HEIs is presented in Table 4.

Table 4. Statistical analysis of the aggregated inclusivity indicator of HEIs

Indicator	Value
Mean	25.12667479
Standard Error	0.221612761
Median	26
Mode	34
Standard Deviation	6.34989205
Sample Variance	40.32112905
Kurtosis	0.184796057
Skewness	-0.732193748
Range	31
Minimum	3
Maximum	34
Sum	20629
Count	821

Based on the calculated indicators, the following conclusions can be made:

- 25.13 is the average inclusivity score for HEIs.
- The median (26) indicates that half of the HEIs have a score below 26, while the other half have a score above it.
- Aggregated inclusivity indicators range from 3 to 34.
- The standard deviation (6.35) characterises the dispersion of data around the mean.
- The skewness value (-0.73) indicates a left-sided (negative) asymmetry in the distribution, suggesting a predominance of HEIs with higher scores over those with lower scores.
- The kurtosis (0.18) indicates that the distribution is close to normal but shows slight peakedness.

The results of the statistical analysis of the aggregated inclusivity indicator for HEIs suggest that the distribution is close to normal with minor asymmetry. Consequently, the quartile method can be used to determine cluster ranges.

Cluster ranges:

- Low inclusivity level: ≤ Q1;
- Medium inclusivity level: Q1 to Q3;
- High inclusivity level: > Q3.

Quartile distribution of the aggregated inclusivity indicator (P_{inc}):

- First quartile (Q1): 21;
- Second quartile / median (Q2): 26;
- Third quartile (Q3): 30.

Formed clusters of HEIs by inclusivity level:

1. Cluster of HEIs with a low inclusivity level: $P_{inc} \leq 21$;
2. Cluster of HEIs with a medium inclusivity level: $21 < P_{inc} < 30$;
3. Cluster of HEIs with a high inclusivity level: $P_{inc} \geq 30$.

The low inclusivity cluster comprises 215 respondents from Ukrainian HEIs, the medium cluster 375 respondents, and the high inclusivity cluster 231 respondents.

The formed clusters reflect different models of development and practices in the field of inclusion. Key characteristics of clusters:

- HEIs in the low inclusivity cluster exhibit the lowest values across most key indicators: the presence of an inclusion policy, systematic monitoring, availability of inclusive infrastructure, funding for relevant initiatives, adaptation of educational programs, and support for students with special needs.
- HEIs in the medium inclusivity cluster are distinguished by more developed infrastructure, systems of grants and scholarships for socially vulnerable groups, more active participation in implementing inclusive practices, a greater number of professional development programs for staff, and increased integration of adaptive teaching methods into the educational process.
- HEIs in the high inclusivity cluster have an inclusion policy, a systematic approach to developing barrier-free spaces, a high level of awareness among leaders and faculty, and active social support, including the participation of students with special needs in the academic and cultural life of the institutions.

The varying levels of development of social inclusion policies and practices across the formed clusters of HEIs are influenced by several key factors affecting their ability to develop, implement, and monitor social inclusion policies:

- Resource availability and funding: Institutions with greater funding, access to external grants, and international assistance have more opportunities to develop comprehensive inclusion policies, establish standards, and conduct regular reporting. HEIs with limited resources often cannot systematically support these processes.
- Level of awareness and professional training of staff: HEIs that regularly organise training in inclusive education demonstrate better policies and practices of social inclusion. In contrast, inclusion initiatives remain declarative in institutions that lack such training.
- Presence or absence of monitoring and reporting systems: Institutions with well-developed monitoring systems for plan and program execution adopt a more systematic approach to implementing inclusive policies and practices.

The distribution of different types of HEIs across clusters is presented in Figure 2.

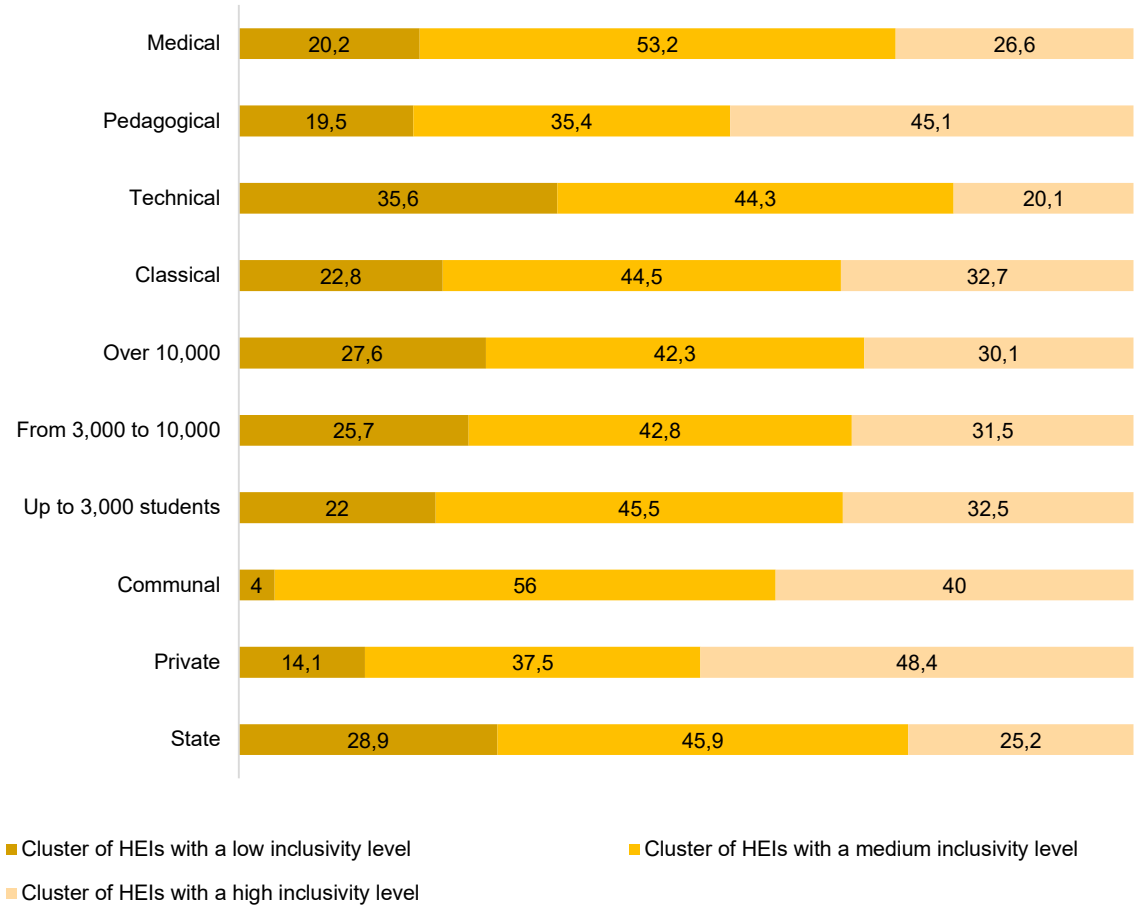

Figure 2. Distribution of different types of HEIs Across Clusters

Data from Figure 2 indicate that the largest share of state-owned HEIs is concentrated in the medium inclusivity cluster (45.9%). Private HEIs predominate in the high inclusivity cluster (48.4%), confirming earlier conclusions about their more active adoption of inclusive policies and practices. Most communal HEIs are found in the medium and high inclusivity clusters (56% and 40%, respectively) and are almost absent in the low inclusivity cluster (4%).

The clustering results reveal no significant differences in the distribution of HEIs across inclusivity clusters, regardless of their size. While the majority of institutions across all sizes fall into the medium cluster (45.5%, 42.6%, and 42.3%, respectively), small HEIs show a somewhat higher representation in the high inclusivity cluster.

The majority of classical, technical, and medical HEIs are concentrated in the medium inclusivity cluster (44.5%, 44.3%, and 53.2%, respectively). Only pedagogical HEIs dominate in the high inclusivity cluster, reinforcing earlier findings about their leading role in implementing inclusive policies and practices.

Clustering revealed differences among HEIs in the realisation of the social inclusion priority. This enables:

- Planning targeted measures to enhance inclusivity in institutions with lower scores;
- Disseminating best practices from the high inclusivity cluster to institutions with limited experience in this area;

- Developing regional and national strategies considering cluster-specific characteristics;
- Formulating institutional policies tailored to the institution type.

The results fully supported all three research hypotheses. Hypothesis 1 was confirmed – private and communal HEIs showed significantly higher inclusivity levels than state-owned institutions. Hypothesis 2 was also confirmed – pedagogical HEIs outperformed technical and medical ones. Hypothesis 3 was strongly supported – high-inclusivity cluster institutions systematically featured dedicated funding, mandatory staff training in inclusion, and functioning monitoring/reporting mechanisms, which were almost entirely absent in the low-inclusivity cluster.

Approaches to Enhancing Inclusivity in HEIs

To foster a more inclusive educational environment, all HEIs must prioritise several critical areas. Enhancing transparency in reporting is crucial for effectively communicating policies, progress, and challenges. Additionally, expanding professional development programs for faculty equips educators with the skills necessary to support the diverse needs of students. Creating barrier-free environments, both physical and digital, and developing adapted educational materials are also vital to ensure accessibility for all students. These efforts require increased funding to address systemic gaps, particularly in state institutions, which often face resource constraints and need organisational changes to institutionalise inclusive policies.

Private and communal HEIs, while generally performing better, should focus on improving information accessibility and actively engaging students in inclusive initiatives. By involving students, particularly through collaboration with student self-governance bodies, these institutions can foster a participatory culture that strengthens inclusivity. Meanwhile, large HEIs should emphasise raising awareness about inclusivity and creating safe learning environments that cater to diverse needs. Small and medium-sized institutions, on the other hand, should prioritise offering students the opportunity to build individual educational trajectories, allowing for personalised learning paths that accommodate varied requirements.

Specific types of HEIs have unique roles in advancing inclusivity. Pedagogical institutions should concentrate on improving information accessibility to ensure all students can access the necessary resources. Classical HEIs need to institutionalise responsibilities for implementing inclusive policies and establishing clear accountability. Medical HEIs should prioritise creating barrier-free educational spaces to meet the diverse physical and learning needs of their students, while technical HEIs should integrate inclusive modules into their programs to promote awareness and the practical application of inclusivity principles.

To support these efforts, increased funding is crucial for developing adapted materials, expanding faculty training, and establishing monitoring systems to track the implementation of inclusive practices. Awareness campaigns can further promote a culture of acceptance and support across all institutions. By adopting a comprehensive and tailored approach that addresses the specific needs of different HEI types and sizes, institutions can create equitable opportunities and foster truly inclusive educational environments for all students.

4. DISCUSSION

The study results highlight the uneven implementation of inclusive practices in Ukrainian HEIs. For instance, high scores in the use of flexible learning formats (88.7%) and opportunities to demonstrate knowledge in various ways (82.6%) contrast with low scores in information accessibility for individuals with disabilities (32.2%) and the creation of adapted learning materials and assistive devices (41.3%). This variability suggests that aspects of inclusion related to general access to education (e.g., learning flexibility) are implemented more effectively, while the specific needs of vulnerable groups remain problematic. This reflects a broader trend noted in the literature toward shifting from a narrow focus on students with special educational needs to a wider approach aimed at creating equal opportunities for all (Symeonidou, 2017; Severiens et al., 2013; Callan, 2020; Stentiford & Koutsouris, 2020; Korthals Altes et al., 2024).

Low scores in information accessibility, adapted materials, and faculty professional development programs align with barriers identified in previous studies (Milic Babic & Dowling, 2015; Moriña, 2017; Yusof et al., 2019; Zabeli et al., 2021; Rashid & Wong, 2023; Korthals Altes et al., 2024; Núñez Nogueroles & Freire, 2025). In the Ukrainian context, where the full-scale war has intensified inclusion challenges, the findings confirm Ukrainian scholars' conclusions about its role in rebuilding educational communities and social cohesion (Hurenko et al., 2023; Nesterova & Orzhel, 2023). The emergence of new vulnerable groups, such as internally displaced persons and veterans, necessitates flexibility and support, aligning with the human-centred philosophy (Udych et al., 2025) and emphasis on unlocking every student's potential (Morus, 2025).

Clustering HEIs by the aggregated inclusivity indicator (P_{inc}) identified three groups with low, medium, and high levels, consistent with the trend toward seeking managerial solutions to overcome systemic barriers (Magnússon et al., 2019; Salmi & D'Addio, 2020). Differences by ownership form – higher scores in private (68.7%) and communal (67.2%) HEIs compared to state-owned (54.6%) – illustrate implementation challenges described in research (Martins et al., 2017; Perera-Rodríguez & Moriña Díez, 2017; Gonzalo et al., 2024; Filippou et al., 2025; Oswal et al., 2025; Mapuya, 2025). These differences are driven by resource dependency and leadership (Martinez-Acosta & Favero, 2018; Nikolaesku et al., 2021; López-López et al., 2022; Hogenes, 2025), underscoring the need for help desks, barrier-free environments, and staff development programs (Milic Babic & Dowling, 2015; Collins et al., 2018; Yusof et al., 2019; Webb & Thi Ngoc Ha, 2024; McEwen et al., 2024; Korkie et al., 2025).

The leadership of pedagogical HEIs in implementing inclusive practices and the lag of technical and medical HEIs point to the need to consider sectoral specificity, a topic rarely discussed in the literature. The absence of significant differences by institution size contrasts with expectations of greater flexibility in smaller HEIs but aligns with the focus on the cultural dimension of the educational environment (Fernández-Batanero et al., 2022). Innovative technologies, as shown in the results, can enhance motivation and engagement (Castellano-Beltran et al., 2025; Pacheco et al., 2020).

The novelty of this study lies in the application of cluster analysis to systematise Ukrainian HEIs by their level of inclusivity. Unlike previous research, which primarily focused on qualitative aspects of inclusion, the proposed approach enables a quantitative

assessment of inclusive practices and identifies typical models of their implementation under wartime conditions. Clustering of HEIs opens opportunities for comparative analysis, dissemination of best practices, and the development of targeted educational policies.

The findings hold practical significance for shaping educational policies in Ukraine. Clustering allows the identification of HEI groups needing support and the dissemination of best practices from the high-inclusivity cluster. It is recommended to increase funding for the creation of barrier-free physical and digital environments, the provision of adapted learning materials and assistive technologies, the introduction of mandatory faculty professional development programs, and the establishment of national inclusivity monitoring, taking into account the wartime context. This will promote societal cohesion and align with European standards (Rome Ministerial Communiqué, 2020; Tirana Ministerial Communiqué, 2024).

A contentious issue remains the measurement of the effectiveness of inclusive practices, recognised as understudied in the literature (Gerdes et al., 2020; Zorec et al., 2022). Survey results based on respondent self-assessment may be subjective, and the focus on quantitative data does not fully capture qualitative aspects, such as the sense of belonging (Rosado-Castellano et al., 2022). Additionally, the sample is limited by the predominance of state HEIs and certain regions, which may affect generalisations.

Future research could involve developing tools for quantitatively measuring inclusivity in the wartime context, such as longitudinal studies on the impact of inclusive practices on the rehabilitation of veterans and the integration of internally displaced persons. A comparative analysis with other countries to identify universal strategies is promising (Singal et al., 2015), as is exploring the role of digital technologies in overcoming barriers for vulnerable groups (Hurenko et al., 2023). It is also worthwhile to study the influence of leadership and funding on clustering to develop targeted policies for enhancing inclusivity in HEIs.

5. CONCLUSIONS

The conducted study provides a comprehensive assessment of the current state of inclusive policies and practices in Ukrainian HEIs. The research revealed considerable variation in the level of inclusivity both across institutions and within different dimensions of inclusion. Clustering HEIs based on the aggregated inclusivity indicator allowed the identification of three groups – those with low, medium, and high levels of inclusivity. The average positive response rate (56.6%) indicates progress in implementing inclusive practices, yet substantial disparities between institutions highlight the need for systemic changes. Key strengths of Ukrainian HEIs include the flexibility of the educational process, diverse methods for demonstrating knowledge, and practices supporting mental health. However, major barriers remain, including limited access to information, insufficient adaptation of learning materials, and a lack of professional development programs for faculty. These issues are particularly acute in the context of the war, which has intensified challenges for vulnerable groups such as internally displaced persons and veterans.

Clustering revealed that private and communal HEIs are more frequently represented in the medium and high inclusivity clusters, while state-owned institutions predominate in the medium cluster due to limited resources and organisational barriers. State-owned HEIs perform strongly in centrally regulated and funded areas (admission quotas and state scholarships) but show the lowest scores in all others: adapted materials, assistive

technologies, faculty training, barrier-free infrastructure, and designated inclusion officers. These practices rely on institutional resources and administrative flexibility rather than mandatory state funding. Pedagogical HEIs demonstrate better performance, underscoring the influence of sectoral specificity. The absence of a clear relationship between inclusivity and institutional size highlights the critical role of resources and leadership. The practical significance of the study lies in the potential to use clustering for developing targeted educational policies.

The following recommendations are proposed: enhance funding to create barrier-free environments and adapted materials; introduce mandatory professional development programs for faculty with a focus on inclusive practices; establish a national inclusivity monitoring system; develop specialised support programs for vulnerable groups, including veterans and internally displaced persons, taking into account the wartime context. These directions will contribute to strengthening social cohesion and rebuilding educational communities in Ukraine, and addressing societal needs amid the war.

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КЛАСТЕРНИЙ АНАЛІЗ ЗАКЛАДІВ ВИЩОЇ ОСВІТИ УКРАЇНИ ЗА РІВНЕМ ІНКЛЮЗИВНОСТІ

Анотація. *Метою дослідження є аналіз впровадження інклюзивних політик і практик у закладах вищої освіти (ЗВО) України та їх кластеризація за рівнем інклюзивності. Дані було зібрано у травні–липні 2025 року за допомогою структурованої анкети в Google Forms серед 821 респондента, до яких увійшли здобувачі вищої освіти, науково-педагогічні працівники та адміністративний персонал різних ЗВО. Застосовано кількісний аналіз відповідей на 34 запитання із закритими варіантами відповідей (α Кронбаха = 0,944), після чого проведено кластерний аналіз на основі квартильного розподілу з використанням агрегованого показника інклюзивності (P_{inc}). Загальна частка ствердних («так») відповідей становила 56,6%. До виявлених сильних сторін належать гнучкі форми навчання, демонстрація знань різними способами і система квотування для соціально вразливих груп. Водночас зафіксовано суттєві прогалини у доступності інформації для осіб з інвалідністю, у професійному розвитку викладачів з питань інклюзивної освіти та в забезпеченні адаптованими навчальними матеріалами. Приватні та комунальні ЗВО демонструють кращі результати порівняно з державними. Лідирують педагогічні ЗВО з 67,1% ствердних відповідей, далі йдуть класичні (59,7%), медичні (55,2%) та технічні (50,4%) заклади, що відображає галузеві відмінності. Кластеризація дала змогу виокремити три групи ЗВО за рівнем інклюзивності: низький ($P_{inc} \leq 21$), середній ($21 < P_{inc} < 30$) та високий ($P_{inc} \geq 30$). На формування цих груп впливали особливості фінансування, рівень підготовки персоналу та наявність систем моніторингу. Отримані результати обґрунтовують необхідність цільової підтримки ЗВО з низькими показниками інклюзивності та поширення кращих практик закладів з високими результатами. Серед політичних пріоритетів – збільшення фінансування на створення безбар'єрного середовища й адаптованих матеріалів, обов'язкова підготовка персоналу та національний моніторинг інклюзивності. Подальші дослідження мають бути спрямовані на розроблення лонгітюдних індикаторів та вивчення впливу інклюзивних практик на соціальну інтеграцію та реабілітацію ветеранів і внутрішньо переміщених осіб.*

Ключові слова: *соціальна інклюзія, заклади вищої освіти (ЗВО), інклюзивність, кластерний аналіз, безбар'єрна освіта, виклики воєнного часу, вразливі категорії здобувачів освіти.*