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Hierarchisation of Criteria for Assessing the Quality of Educational Services at Polish Universities from the Student Perspective: Analysis Using the AHP Method

Abstract: The article identifies and hierarchises the main criteria for assessing the quality of educational services at Polish universities from the student perspective. The study addresses the need to determine the relative significance of particular quality dimensions which could support decision-making processes in university quality management. An exploratory and pilot study was conducted in two stages encompassing focus group interviews, individual in-depth interviews, and content analysis. The qualitative stage distinguished eight main criteria for the quality of educational services. The quantitative stage applied the analytic hierarchy process (AHP) method on a purposive sample

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of $N = 10$ students, conducting pairwise comparisons and verifying the consistency of judgments using the *CR* metric. The results indicate that the following criteria received the highest weight: academic staff qualifications, competence, and development (24.4%), content and modernity of curricula (23%), and technology and digital education (18%). These criteria comprise the core of educational services quality from the research sample's perspective. Student support ranked a middle position and displayed a greater diversity in evaluations, while infrastructural, institutional, and noneducational criteria received lower ranks in the hierarchy. The results demonstrate that the quality of educational services has a hierarchical structure, and the AHP method could constitute a useful tool for identifying pro-quality priorities, planning improvement actions, and allocating university resources.

Keywords: quality of educational services, higher education, quality management, AHP method, quality criteria, students

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1. Introduction

The quality of educational services in higher education constitutes one of the crucial research areas in management and quality sciences and a vital element of strategic management at the university. Faced with growing competitive pressure, the ongoing digitisation of educational processes, the internationalisation of education, and changing student expectations, universities must systematically improve their mechanisms for designing, implementing, and assessing educational services (Wawak, 2012:118–122; Cieciora, 2015:43–52; Becker, Krassowska, 2018). What amplifies this issue in the Polish context involves unfavourable demographic trends influencing the education system and demand for education. Moreover, growing competitive pressure induces universities to abandon management based on the number of enrolled students in favour of building a sustainable competitive advantage based on the quality, adequateness, and usefulness of the educational services offered (Rządowa Rada Ludnościowa, 2023:29–31; Kwiek, 2015:26–27).

The quality of educational services represents a multidimensional, relational category, dependent on stakeholder perspective. This category encompasses both the direct educational process and the organisational, infrastructural, technological, and social elements which create the overall experience of students as recipients and participants. Thus, education quality constitutes an important, yet not the only one, component of the quality of educational services. Therefore, the perspective of university management necessitates both the recognition of factors impacting quality and the determination of their relative importance.

The literature indicates numerous factors that determine the quality of educational services, including the competence of academic staff, the relevance of teaching programmes, infrastructure, the organisation of educational processes, student support, relationships with the socioeconomic environment, and university reputation (Maciąg, 2011:125–129; Cieciora, 2015:43–52; Tsinidou, Gerogiannis, Fitsilis, 2010:227–228; Janik, Czarkowski, 2024:40–43). Despite the developing research on quality in higher education, one sees a research gap concerning the comparative definition of the importance attached to particular quality criteria from the student perspective. The existing studies often concentrate on identifying catalogues of quality factors, rather than attempting to introduce hierarchisation and assign relative weights.

The gap has both cognitive and practical implications. Under conditions of limited financial, organisational, and human resources, universities must decide which quality areas to prioritise for improvement. A catalogue of quality determinants alone displays limited management usefulness if it fails to indicate the most important factors for key stakeholders. For this reason, universities need approaches enabling a shift from the identification of quality factors to an ordered priority structure, supporting decision-making processes in quality management.

The article aims to identify and hierarchise the main criteria for assessing the quality of educational services offered by Polish universities from the student perspective. For this purpose, an exploratory and pilot approach was adopted, combining a qualitative phase aimed at empirically identifying quality criteria with a quantitative phase based on the analytic hierarchy process (AHP) method. The choice of the AHP method stems from its suitability for analysing multi-criteria problems that require determining the relative importance of multiple criteria and ordering them into a priority structure (Saaty, 1990; Vaidya, Kumar, 2006; Wachstiel, 2013:113–115). Due to the pilot character of the quantitative phase and the purposive sample of $N = 10$ students, the obtained results should be interpreted as a preliminary recognition of the preference structure in the studied sample, rather than as representative findings for the entire student population in Poland.

The article addresses three research questions:

1. What main criteria for assessing the quality of educational services emerge from the study's exploratory phase based on the perspective of various stakeholder groups?
2. What shape does the criteria's hierarchy of importance take in light of student assessment using the AHP method?
3. What implications does the hierarchy of criteria carry for quality management at universities?

The article contributes to management and quality science by empirically organising quality criteria for educational services and determining their relative importance in the context of Polish higher education. Above all, this contribution entails a departure from a descriptive catalogue of quality determinants in favour of a priority model which may support quality management, planning pro-qualitative actions, and the allocation of resources at universities.

Moreover, the research demonstrates the usefulness of multi-criteria decision-making methods, especially the AHP method, in analysing complex organisational problems associated with the functioning of higher education.

The article features the following structure. The first section presents theoretical foundations of the quality of educational services in higher education, students' role as quality stakeholders, and an overview of approaches to assessing and hierarchising quality criteria. Next, the research methodology is discussed, including the exploratory phase and the quantitative phase using the AHP method. The following section presents the research results, including a preliminary evaluation of criteria importance and the final hierarchy of relative weights. The article ends with a discussion of the results, an indication of implications for quality management at universities, and synthetic conclusions.

2. The Quality of Educational Services in Higher Education: A Theoretical Approach and Assessment Methods

2.1. The Quality of Educational Services as a Multidimensional Category

The quality of educational services in higher education constitutes a complex, multidimensional category, difficult to define unequivocally. The literature emphasises that quality has no single universal definition or an objective measurement unit, for its assessment depends on the adopted perspective, the character of the analysed process, and the recipients' expectations (Kolman, 2013:31–41, 48–49). In the case of educational services, this issue proves especially crucial, because they are professional, nonmaterial, interactive, and relational in nature, with their quality cocreated by the university, the academic staff, the students, and the broader socioeconomic environment.

As opposed to the quality of tangible products, whose assessment may rely on more objective technical parameters, the quality of educational services manifests itself primarily in the process of their provision. Beside the educational outcome, quality encompasses the way of organising the educational process, relationships between its participants, resource accessibility, administrative efficiency, infrastructural conditions, and the technological environment. Therefore, assessing quality requires combining objective criteria, such as standards, infrastructure, and process efficiency, with subjective criteria, referring to the recipients' experiences, satisfaction, and perceived value (Badri, Davis, Davis, 1995:36–40; Parasuraman, Zeithaml, Berry, 1988:12–15).

The article approaches the quality of educational services as a category broader than the quality of education. Above all, the latter refers to the direct educational process, encompassing, among other aspects, academic staff competence, curriculum content, teaching methods, and learning outcomes. By contrast, the quality of educational services further includes organisational, infrastructural, relational, and institutional elements that cocreate the overall

experience of students as recipients and participants. This distinction enables an analysis of the university as both an entity implementing the educational process and an organisation providing complex educational services. Therefore, static and universalistic definitions of quality prove insufficient to capture the contemporary educational experience. These definitions fail to fully consider the changeability of student expectations, the development of digital technologies, the role of institutional support, the significance of relationships with the socioeconomic environment, and the diversity of education models. Therefore, one should analyse the quality of educational services as a dynamic category depending on the organisational, technological, and social context, as well as the experience of various stakeholder groups. However, although higher education employs a variety of quality management concepts originally developed in the business sector, their application to the academic reality demands caution. The university does not represent a typical service organisation, because it simultaneously performs teaching, scientific, and social functions, operating under conditions of academic autonomy and answering to multiple groups of stakeholders. For this reason, one should adapt quality management models in higher education to the specificity of the university's mission, rather than apply them mechanically (Sułkowski, 2016:105–106; Brdulak, 2021:29).

Adopting a broad approach to the quality of educational services enables one to better capture the complexity of contemporary university functioning. As a result, quality assessment demands both the identification of particular determinants and the definition of their relative importance. Only this approach guarantees a transition from a general description of quality to its application in management, improvement, and resource allocation processes at universities.

2.2. Students as Stakeholders and Cocreators of the Quality of Educational Services

In research on the quality of educational services in higher education, the student perspective occupies a particularly crucial spot. This importance stems from the fact that students represent both direct recipients of educational services and active participants in the learning process. Students experience the consequences of decisions made at the level of the curriculum, educational organisation, academic staff competence, infrastructure, technological environment, and institutional support. Therefore, student assessments constitute a significant source of information for university quality management, both in research on the factors determining the quality of educational services and in the practice of internal quality assurance systems (Tsinidou, Gerogiannis, Fitsilis, 2010; VIAMODA, 2014: 9–10; Pacholarz, 2022:67–69).

One can justify the significance of the student perspective based on the stakeholder theory, according to which an organisation should consider the needs, expectations, and influences of various groups involved in its functioning (Freeman, 1984:46–53). As a multi-stakeholder organisation, the university answers to its students, staff, and administration, public authorities, employers, graduates, and the socioeconomic environment. Each of these groups offers a diverse perspective on the quality assessment due to their role and the type of their relationship with the university.

Above all, students evaluate the quality experienced, while faculty members focus on the conditions of teaching, and management staff and experts consider the broader organisational, strategic, and institutional dimension of quality. In this structure, students occupy a particular position, as they participate directly and continuously in the process of providing educational services. Their perspective enables one to capture the quality revealed in their everyday contact with the educational process, university organisation, technology, infrastructure, as well as administrative and extracurricular support. This does not mean that the student perspective exhausts all possible understandings of quality in higher education; nonetheless, it constitutes a crucial reference point for quality management at universities.

Contemporary approaches to the quality of educational services depart from treating students exclusively as passive recipients. One can understand students also as co-participants and cocreators of educational value, for their engagement, activity, preparation, motivation, and interactions with the academic staff influence the course and outcomes of the educational process. In this sense, the quality of educational services emerges in the relationship between the university and the student, and is not exclusively 'provided' by the institution. Machura (2024: 8–9) emphasises the significance of the relational and resource-based dimensions of the university's functioning as well, indicating the need to view an educational institution as a system of connections between resources, processes, and participants in the academic environment.

Previous research indicates that, from the student perspective, the quality of educational services encompasses primarily areas such as academic staff competence, the content and relevance of curricula, teaching process organisation, infrastructure, relationships with the staff, the accessibility of administrative and counselling support, and the connection between education and labour market demands (Tsinidou, Gerogiannis, Fitsilis, 2010; Rudzewicz, 2013; Janik, Czarkowski, 2024:40–43). From this perspective, students constitute more than just recipients of pro-quality actions: they represent a group whose experiences and assessments can serve to verify the effectiveness of the university's organisational, educational, and supporting solutions (Grudowski, Szefler, 2015).

From the perspective of quality management, student voices hold both a diagnostic and decision-making significance. These voices enable the identification of areas in need of refinement, the usefulness assessment of implemented solutions, and the verification of whether formal quality assurance mechanisms translate into the actual study experience. However, using this perspective requires departing from treating student opinions exclusively as declarations of satisfaction. One should analyse these opinions as sources of data supporting the design, monitoring, and improvement of the quality of educational services. As a result, the student perspective constitutes a valid starting point for examining the hierarchy of quality criteria for educational services. This perspective allows one to determine which dimensions of quality emerge as the most important for direct recipients of and participants in the educational process. At the same time, one should interpret the results of such an analysis in the broader context of the university's multi-stakeholder character. Effective quality management requires combining the student perspective with those of the academic staff, management, administration, and the socioeconomic environment.

2.3. Contemporary Conditions of the Quality of Educational Services in Higher Education

Contemporary higher education operates in an environment of dynamic social, technological, and organisational changes that influence the way of understanding and assessing the quality of educational services. The most significant conditions include growing competition between universities, the internationalisation of education, changing labour market expectations, pressure on the practical dimension of educating, unfavourable demographic trends, and the ongoing digitisation of the educational process (Szabłowski, 2017; Goczek, Witkowska, Witkowski, 2020:133; Brdulak, 2021:34–40).

Both internal and external determinants shape the teaching process in higher education. The former include the engagement of university authorities, academic staff competence, the structure and content of curricula, the teaching methods used, infrastructure, and organisational culture (Cieciora, 2015:30–32). In turn, external factors encompass labour market demands, legal regulations, demographic conditions, the directions of scientific development, and technological progress (Radziewicz-Winnicki, Wołk, 2015). In this context, one could associate the significance of competence and professional advancement opportunities with the quality of the organisation's human capital. This connection reinforces the justification for approaching academic staff qualifications, competence, and development as a key aspect in the quality of educational services (Kowalczyk, Roszyk-Kowalska, Cedro, 2024).

In the Polish context, demographic changes and growing competition for student applicants emerge as particularly significant. Low birth rates amplify pressure on universities to sustain formal quality standards, as well as actively improve their educational offer, the learning process organisation, and the student experience. Under these conditions, the quality of educational services becomes both an academic category and the university's strategic resource, impacting its attractiveness, competitive advantage, and long-term sustainability.

Digitisation represents a crucial factor redefining the quality of educational services. Recent years have shown that the quality of the digital environment, the accessibility of e-learning platforms, the technological competence of students and the academic staff, and the university's ability to organise teaching in online and hybrid forms have become integral elements of the teaching process (Stecyk, 2018; Shohel et al., 2021; Ober, Kochmańska, 2022; Istenič, 2024). Therefore, contemporary quality assessment cannot disregard the technological dimension, which co-determines the accessibility, flexibility, and effectiveness of educational services. Combining traditional forms of teaching with e-learning, hybrid learning constitutes both a response to the pandemic crisis and a lasting element of higher education transformation (Istenič, 2024; Woźnicki, 2024:25, 60).

One also notices the rising significance of associating study curricula with the labour market demands and the socioeconomic environment. Universities undergo evaluation through the lens of both the formal implementation of learning outcomes and the ability to prepare graduates to function in a changing professional environment. The relevance of the curriculum, the development of practical skills, cooperation with employers, the quality of internships,

and the internationalisation of education become crucial elements in assessing the quality of educational services. In this context, intercultural competence proves important as well, for its development reinforces graduates' preparation for living in a diversified professional and social environment (Freund, 2024).

Furthermore, one should approach the significance of educational services' quality from a broader social and economic perspective. At the macrolevel, the quality of higher education can influence the level of human capital, social mobility, innovativeness, and the possibility of socioeconomic development (Goczek, Witkowska, Witkowski, 2020:133). Therefore, improving the quality of educational services represents not just an internal task of universities, but also their greater responsibility to society and economy.

Regarding the transformation of Polish higher education, it becomes crucial to systematically monitor and update quality criteria based on empirical data. This need stems from two factors: first, the long-term development directions of higher education and science, accentuating the rise in the quality of education, its adjustment to social and economic needs, and the improvement of system management; and second, newer forecasts for the development of higher education till 2030 (Ministerstwo Nauki i Szkolnictwa Wyższego, 2015: 6; Woźnicki, 2024:25, 60). These forecasts demonstrate the need to adjust universities to changing conditions, improving the quality of education, developing staff competence, and reinforcing quality evaluation mechanisms.

As a result, contemporary quality management in higher education demands considering traditional quality determinants, such as academic staff competence, curricula, and infrastructure, as well as new conditions associated with digitisation, teaching flexibility, student support, relationships with the environment, and the experience of educational service recipients. This entails a need for systematic monitoring of both the quality level and the changing hierarchy of criteria. Given the limited university resources, the question of which quality areas should gain priority in pro-quality actions gains particular significance.

2.4. Models and Methods for Assessing the Quality of Educational Services

Research on the quality of educational services in higher education employs diverse models, methods, and measurement tools. Their selection depends on the aim of the analysis, the adopted definition of quality, and the perspective of stakeholders, with their assessments taken into consideration. In the literature on quality management and in organisational practice, researchers utilise, among others, satisfaction surveys of service recipients, benchmarking, performance indicator systems, quality audits, and organisational excellence models (Parasuraman, Zeithaml, Berry, 1988; Kaplan, Norton, 1992; Kuźmicz, 2015:115–148; Oliver, 2015: 4–8).

One of the most recognised approaches to measuring the quality of services is the SERVQUAL model, based on the analysis of discrepancies between recipient expectations and the perception of the received service's quality (Parasuraman, Zeithaml, Berry, 1985; 1988). Researchers have employed this model in higher education research as well, for it enables them to assess service

quality through such dimensions as reliability, responsiveness, certainty, empathy, and material service elements. At the same time, the literature emphasises the limitations of directly transferring the SERVQUAL model to the academic environment. Educational services remain distinct from many market services: they are long-term, cocreated by the recipient, heavily dependent on the educational relationship, and embedded in the university's public and social mission (Wiktor, 2014).

To better adjust measurement tools to higher education specificity, researchers developed models specifically designed for higher education, including HEdPERF, focusing on the quality of services in educational institutions (Abdullah, 2006). Such approaches emphasise both the traditional dimensions of service quality and elements particularly significant to universities, including academic staff quality, curricula, administrative support, institutional reputation, infrastructure, and student relations. Their significance stems from the fact that they capture the organisational and institutional character of educational service quality better than general models employed in the service sector.

Furthermore, systemic and process approaches play a significant role in higher education quality management. Examples include total quality management (TQM), the European Foundation for Quality Management (EFQM) model, ISO standards, and the European quality assurance framework. The TQM approach understands quality as the result of constant process improvement, employee engagement, and a focus on stakeholder needs. In relation to higher education, these approaches demand adaptation to the educational process specificity, the role of students and academic teachers, and the university's organisational culture (Zalewska, 2024:34–42). By contrast, the EFQM model emphasises the need to balance process efficiency, stakeholder satisfaction, and strategic outcomes, which fosters the perception of the university as a learning organisation that constantly perfects its operating mechanisms (Grudowski, 2022).

Particular importance in the context of European higher education belongs to *Standards and Guidelines for Quality Assurance in the European Higher Education Area* (ESG). These reinforce the significance of internal quality assurance systems, stakeholder participation, transparency of procedures, and university responsibility for the quality of offered study programmes. From a broader perspective, the European University Association (EUA) documents highlight the role of strong and autonomic universities in building a knowledge society, developing the quality of teaching, learning, research, and innovation, and undertaking the social and economic mission of universities (European University Aassociation, 2005: 1; Chmielecka, 2015). In this context, one should analyse the quality of educational services not only as a reported level of student satisfaction but also as the result of the quality management system's functioning, including design, implementation, monitoring, and improvement of educational and support processes. However, one should emphasise that most of the abovementioned approaches focus on identifying, describing, and monitoring quality dimensions. These models indicate areas to consider when assessing the quality of educational services; however, they do not always allow one to determine the relative importance of individual criteria. From the university management perspective, this proves significant, because with limited resources, the identification of numerous quality determinants fails to answer the question of which of those factors one should prioritise. Therefore, methods enabling

both the identification of quality criteria and introducing a hierarchy according to their relative importance gain increasing significance. In particular, multi-criteria decision-making methods enable the ordering of complex management issues which encompass numerous criteria. In the higher education context, these approaches may support decision-making in terms of resource allocation, study programme improvement, staff competence development, technological investments, and the development of student support systems. The following subsection elaborates on this issue, expounding multi-criteria methods and the research gap that justifies the use of the AHP method.

2.5. Multi-Criteria Methods, the AHP Method, and the Research Gap

In the quality management of educational services, multi-criteria decision-making methods gain particular significance, enabling the analysis of issues concerning interconnected criteria. Their usefulness involves the possibility of ordering complex assessments and identifying the relative importance of individual factors. Unlike approaches based exclusively on identifying the catalogue of quality determinants, multi-criteria methods enable a shift from the description of factors to a priority structure which one can employ in management, planning, and resource allocation processes.

The most frequently employed multi-criteria decision-making methods include the AHP technique, developed by T.L. Saaty. This method enables the decomposition of a complex decision-making problem into an ordered hierarchical structure, conducting pairwise comparisons, and identifying relative weights of individual criteria. Moreover, its substantial advantage involves the possibility of verifying the consistency of respondents' judgments using the consistency ratio (*CR*), which increases evaluation transparency and controllability (Saaty, 1990; Vaidya, Kumar, 2006; Wachstiel, 2013:113–115; Prusak, Stefanów, 2014:14; Prusak, 2017:21–24, 66–67).

In particular, the AHP method proves useful in situations where the analysed issue has a multidimensional and multi-criteria character, and its assessments requires considering subjective preferences of respondents or experts, as well as quantitative and qualitative criteria (Vaidya, Kumar, 2006; Doloi, 2008). Researchers widely use this method in the analysis of decision-making problems in areas such as logistics, production, project management, location selection, assessment of investment options, and assessment of service quality in other sectors (Vaidya, Kumar, 2006; Doloi, 2008; Jastrzębski, 2015; Chen, Wang, 2017). In higher education, researchers have employed the AHP, for instance, to assess the quality of e-learning environments, evaluate academic staff, and select areas for improving university operations from the student perspective (Kuchta, Ryńca, 2013:243; Becker, Krassowska, 2018; Stecyk, 2018). Still, the AHP usage in Polish research on quality management in educational services, understood as the hierarchisation of quality criteria from the student perspective, remains relatively

underdeveloped. Therefore, the AHP application in this study has an exploratory and pilot character, constituting an attempt to adapt the multi-criteria approach to the analysis of quality priorities in university management.

Therefore, the contribution of the present study should not be understood as the proposal of a new multi-criteria method. Rather, it lies in applying the AHP method to a set of educational service quality criteria identified empirically in the exploratory phase and in using this procedure to order these criteria from the student perspective. This distinguishes the study from earlier Polish applications of AHP in higher education, which focused mainly on selected areas such as e-learning systems, academic staff evaluation, or the selection of improvement areas in university operations. The present article concentrates on the overall hierarchy of educational service quality criteria and links this hierarchy with the problem of quality management priorities at universities.

Despite growing interest in the quality of educational services, many studies focus on the identification of factors influencing the quality of education and student satisfaction. Researchers less frequently attempt to assign weights to these factors and order them into a hierarchy of priorities. Such efforts procure a catalogue of quality determinants with limited management usefulness, as it fails to indicate which areas deserve improvement in the first place.

Therefore, rather than the recognition that the quality of educational services constitutes a multidimensional phenomenon, the research gap concerns a lack of structured knowledge on the relative importance of individual criteria in the Polish context of higher education. For management and quality sciences, this gap proves crucial, since it limits the ability to design pro-quality decisions based on priorities rather than exclusively on general declarations and broad catalogues of factors. Against this backdrop, adopting a research approach combining the exploratory phase with the criteria hierarchisation method becomes reasonable. The empirical identification of quality criteria enables one to avoid limiting the analysis to an a priori set of factors drawn from the literature, whereas the AHP technique enables the determination of their relative weights. This solution increases both the cognitive and management value of the research by moving from the question of what criteria comprise the quality of educational services to the question of which criteria prove the most significant from the student perspective.

As a result, adopting a multi-criteria perspective constitutes a justified response to the complex quality of educational services. This perspective enables the organisation of quality criteria in a manner useful for the practice of university management, especially in terms of planning pro-quality actions, allocating resources, designing support systems, and improving the teaching process. Such an approach provides a direct transition to the article's methodological section, which presents a two-stage research project based on the identification of quality criteria and their hierarchisation using the AHP method.

3. Research Methods and Material

3.1. Research Project and Process Logic

The research had an exploratory and pilot character. Designed as a sequential mixed study, it combined a qualitative stage with a quantitative one. The adopted process logic assumed an empirical identification of quality criteria for educational services, followed by the determination of their relative importance using the AHP method. This solution stemmed from the multidimensional and contextual character of the quality of educational services and from the need to order quality criteria into a priority structure.

In accordance with the approach adopted in the article's theoretical part, I treated the quality of educational services as a category broader than the quality of education: the former encompasses both the teaching process and organisational, infrastructural, technological, and relational elements. Therefore, the research did not adopt a closed, a priori catalogue of quality criteria; instead, it employed an exploratory approach, which enabled their empirical identification from qualitative material and subsequent operationalisation for the purposes of the AHP analysis. This solution reduced the risk of overly narrowing the concept of educational service quality to a single theoretical model, while maintaining references to the relevant literature.

The research project encompassed two complementary stages. The first, qualitative, stage strove to recognise ways of understanding the quality of educational services and to distinguish main criteria relevant from the perspective of educational process participants. The second, quantitative and pilot, stage employed the AHP method in order to determine relative weights of previously identified criteria and to arrange their hierarchy. The final hierarchisation reflects the perspective of students, treated as direct recipients of educational services and key stakeholders within the university quality assurance system.

The research project combined two analytical approaches: the exploratory identification of quality criteria and their quantitative hierarchisation. This enabled me to indicate the main quality dimensions of educational services and to determine their relative importance. In this way, one can move from the descriptive catalogue of quality determinants to a priority model that can support university decision-making processes, especially in conditions of limited organisational, financial, and temporal resources.

3.2. Exploratory Phase: Identification of Quality Criteria

The exploratory phase aimed to identify and preliminarily reduce the quality criteria for educational services offered by Polish universities. This phase employed a qualitative research strategy, combining partially structured focus group interviews (FGIs) with individual in-depth

interviews (IDIs). This solution captured the diverse perspectives of educational process participants and ensured in-depth recognition of themes crucial to operationalise the concept of educational services' quality.

I conducted FGIs between February and May of 2024 in three purposive sample groups: representatives of university management staff (four participants), academic staff (seven participants), and students (ten participants). Additionally, I conducted four IDIs with experts in the quality of education, quality management, and university operations. In total, 25 respondents participated in the qualitative phase. Purposive sampling aimed to include individuals representing diverse yet complementary roles in the higher education system, and thus to consider various approaches to the quality of educational services.

Every interview followed a preprepared research scenario, encompassing questions about the understanding of educational services' quality, its conditioning factors, and the changes occurring within contemporary higher education. The interviewees consented to participating in the study, and the collected material underwent anonymisation during the compilation phase. I documented the interviews in the form of detailed research notes taken during and immediately after their conclusion.

The study employed content analysis with elements of thematic analysis. The first step involved a preliminary codification of the material, identifying recurring themes, concepts, and ways of evaluating the quality of educational services. Then, I grouped the codes into broader thematic categories by comparing material from various respondent groups, considering both areas of agreement and differences in interpretative emphasis. This enabled me to reduce the number of categories, eliminating singular and overly detailed themes, as well as those substantially overlapping in meaning. Throughout the analysis, I maintained a decision path including the transition from specific codes to main categories, which facilitated consistency control of the material reduction process.

The criteria for the final identification included: the repeatability of a particular theme in the empirical material, its significance as assigned by respondents, and its analytical utility from the perspective of the hierarchisation phase to follow. The exploratory phase produced eight main criteria for the quality of educational services: KG1–KG8. I deemed the criteria sufficiently broad to encompass the most important dimensions of the educational experience, while remaining analytically distinct enough to prove useful in the following research phase. This catalogue constituted the basis for constructing the quantitative tool employed in the AHP phase.

3.3. Sample Selection and Respondent Characteristics in the AHP Phase

The quantitative phase entailed purposive sampling of ten respondents. The adopted sampling strategy was consistent with the exploratory and pilot character of the study and the assumptions of the AHP method, which emphasises the respondents' ability to formulate conscious and relatively consistent comparative judgments (Saaty, 1990). This phase did not aim to obtain

results statistically representative of the entire student population. Instead, I wished to preliminarily identify the preference structure and determine the relative importance of quality criteria for educational services in the studied sample.

The limited size of the sample was consistent with the pilot aim of the study and with the intention to verify the applicability of AHP to the hierarchisation of educational service quality criteria. Nevertheless, the small sample size reduces the scope of inference and prevents generalisation of the findings to the broader student population. For this reason, the results should be understood as an initial organisation of preferences within the studied group, not as a statistically representative diagnosis.

The quantitative research phase proper focused on the perspective of students as direct recipients of educational services. Selected from an initial pool of 20 individuals invited to the study, a sample of $N = 10$ students qualified to participate in the AHP analysis. The respondents represented students from universities that scored highly in the 'management' study programme ranking conducted by the Perspektywy Education Foundation (Perspektywy, 2022). The scope of the study justified the respondent selection. The 'management' study programme appeared as an appropriate research context due to its association with quality management, organisational functioning, and service processes evaluation. Moreover, I assumed that the interviewees' active attitude toward academic life facilitated the formulation of more reflective assessments regarding the quality of educational services and increased the chance of obtaining consistent comparative judgments, which proves crucial in the AHP procedure.

The study treated the research sample as a panel of informed respondents, capable of assessing the importance of particular quality criteria based on their own study experience. Such an approach limits randomness in responses and reduces the risk of logical inconsistency in the pairwise comparison process. Still, the adopted sampling had an analytical and purposive character rather than a representative one – a choice characteristic of pilot studies and applications of multi-criteria methods directed at preliminary preference organisation.

Given the study's pilot character, detailed respondent metric data, such as gender, age, year of study, type of university, form of study, or level of study, were not collected. This decision limits the possibility of conducting comparative analyses between respondent subgroups and restricts the assessment of sample differentiation. Consequently, the quantitative phase should be treated primarily as a methodological and exploratory verification of the usefulness of AHP in organising student preferences regarding educational service quality criteria.

3.4. The AHP Method and Research Tool Design

The quantitative phase employed the AHP method, designed by T.L. Saaty. The specificity of the research problem justified the choice of this method, for the quality of educational services constitutes a multidimensional category, and its assessment requires consideration of numerous criteria which carry varying importance. The AHP method allows one to organise such

assessments through the formalisation of respondents' judgements in the form of relative weights, thus moving from qualitative preferences to a quantitative representation of priority structure (Saaty, 1990; Vaidya, Kumar, 2006; Prusak, Stefanów, 2014:14; Prusak, 2017:66–67).

The research tool was an authorial AHP questionnaire based on the eight quality criteria for educational services (KG1–KG8) identified in the exploratory phase. The study's hierarchical structure comprised: the main objective, understood as the quality assessment of educational services, and eight main criteria subject to pairwise comparisons. The respondents assessed the relative weight of each criterion in relation to the others, referring their judgments to the main research objective.

For the set of eight criteria, each respondent performed 28 pairwise comparisons in total, which stemmed from the number of possible pairs as defined by formula (1): $n(n-1)/2$. The respondents conducted assessments with the use of Saaty's nine-point scale, enabling the expression of one criterion's degree of predominance over another – from equivalence to extreme dominance. The procedure of pairwise comparisons facilitated a more reflective judgment of individual criteria's relative importance than a simple score assessment, as it demanded relating each criterion to another.

In order to facilitate analysis and maintain interpretative transparency, I codified the criteria (KG1–KG8) in accordance with previously defined quality dimensions of educational services. The research tool design directly involved the results of the qualitative phase, which ensured consistency between the exploratory and quantitative phases and enabled the operationalisation of empirically identified categories.

The application of the AHP method in this study had a pilot and exploratory character. Rather than to obtain universal weights for the entire student population, I aimed to identify the preference structure in the research sample and to preliminarily rank the relative importance of quality criteria for educational services.

3.5. Operationalisation of Assessment Criteria for the Quality of Educational Services

Given the results of the exploratory phase, including FGIs and IDIs, I distinguished eight main quality criteria for educational services in higher education. The adopted set is holistic, combining resource, educational, technological, relational, organisational, and institutional aspects. These cocreate the overall experience of students as recipients of educational services.

The distinguished criteria have an analytical character: they serve to organise the complex phenomenon of educational services' quality for the purposes of further multi-criteria analysis. In practice, individual criteria might partially overlap; however, their separation enables one to compare the relative importance of quality dimensions. Table 1 presents the detailed criterion operationalisation along with sample responses from the qualitative phase.

Table 1. Operationalisation and definitions of the main quality criteria for educational services

Code	Main criterion	Scope and interpretation (operationalisation)	Sample responses from the qualitative phase
KG1	Academic staff qualifications, competence, and development	The level of staff education and experience, teaching and research competence, participation in training and development programmes, and openness to teaching innovations. **The criterion refers to the quality of the academic staff's human capital and its capability to implement the teaching process.**	'For me, the quality of studies begins with who teaches and whether they can convey knowledge in a practical and relevant manner, rather than solely from a textbook.' (ST4)
KG2	Content and modernity of curricula	The relevance and topicality of educational content; curriculum alignment with the labour market demands and international standards; learning outcomes consistency; curriculum flexibility. **The criterion refers to the quality of designing and updating the university's educational offer.**	'Even excellent academic staff cannot help if the curriculum is outdated, and after leaving the university, it turns out that the things they taught us no longer find use in the labour market.' (ST10)
KG3	Technology and digital education	The availability and reliability of the digital environment, including e-learning platforms and IT systems; the use of modern digital tools, including AI-based solutions; the integration of online and hybrid classes. **The criterion refers to the growing role of digital technologies in the teaching and quality management process.**	'Digital education is not just Zoom; it is the entire architecture supporting the learning process, including the use of AI and cloud resources in teaching.' (E1)
KG4	Infrastructure and conditions of the learning environment	The quality of classrooms, laboratories, libraries, digital repositories, and student workspaces; the availability of sport facilities; ergonomics; accessibility for individuals with disabilities. **The criterion refers to material and organisational study conditions.**	'Material conditions are important, because they influence comfort, but that is more of a backdrop – a modern classroom or access to adequate resources will never replace a good teaching level, although their lack is very disruptive.' (ST1)
KG5	The university's integration with the socio-economic environment	Collaboration with enterprises, public administration, and social organisations; internship programmes; joint teaching, research, and implementation projects; the university's presence in the innovation ecosystem; knowledge transfer mechanisms. **The criterion refers to the university's role as a participant in socioeconomic life.**	'What I find important is whether the university has contacts with enterprises and whether I can undergo meaningful internships where I can actually learn something.' (ST2)

Code	Main criterion	Scope and interpretation (operationalisation)	Sample responses from the qualitative phase
KG6	Student support	Academic and career counselling; psychological support, tutoring, and mentoring; compensatory education programmes; activities promoting student equality, inclusiveness, and well-being. **The criterion refers to institutional and relational forms of student support during studies.**	'You can especially see the quality of support in crisis situations – whether there is psychological help available and whether the dean's office helps solve problems instead of multiplying them.' (ST9)
KG7	The university's reputation, transparency, and institutional accountability	National and international reputation of the university; transparency of actions; the efficiency of the quality assurance system; institutional accountability to stakeholders and the social environment. **The criterion refers to ethical, communicative, and institutional dimension of the university's functioning.**	'Quality also means accountability – the way we communicate with the environment and whether our actions are transparent and consistent with social values.' (KZ1)
KG8	Extracurricular initiatives and activities	Student organisations, science clubs, social projects, cultural and sport events, and initiatives supporting academic community integration and the development of social skills. **The criterion refers to the role of extracurricular activities in shaping the overall student experience.**	'University is not only about lectures. Quality also refers to what happens after classes – science clubs, projects, where one can develop soft skills and meet people.' (ST5)

Legend: ST – student; N – academic teacher; KZ – management staff; E – expert.

Source: own elaboration based on conducted qualitative research.

The identified criteria find reflection in the exploratory phase responses, which proves their empirical justification and utility for further operationalisation. A criterion catalogue defined in this way constituted the foundation for the AHP questionnaire, enabling the quantitative hierarchisation of criteria from the student perspective in the subsequent research phase.

3.6. Data Analysis Procedure, Judgment Consistency, and Study Limitations

In order to establish a hierarchy for the quality criteria of educational services, the study employed a two-stage analytical procedure, encompassing preliminary scoring and the analysis proper using the AHP method. This approach enabled me to recognise the general direction of the respondents' preferences and to introduce their more organised, structural hierarchisation.

First, the respondents performed a direct allocation of importance, distributing 100 points among eight quality criteria. This auxiliary and exploratory procedure aimed to capture the initial valuation system and identify potential areas of convergence and divergence in assessments.

The results of this stage did not constitute the foundation for determining the final weights; instead, they served as an introduction and support for the interpretation of the results obtained with the AHP method.

The second phase employed the AHP method based on pairwise comparison. The individual comparison matrixes served to determine weight vectors for each respondent, reflecting the relative importance of individual criteria. I represented the weights of criteria as normalised values, whose sum equalled 1 for each respondent. Next, I aggregated the results at the sample level by averaging the individual weight vectors.

The arithmetic mean was used to aggregate individual weight vectors at the sample level. This approach corresponds to the aggregation of individual priorities (AIP), since the study did not aggregate pairwise comparison matrices directly, but first determined individual priority vectors and then combined them at the group level. In AHP group decision-making, the AIP procedure allows the use of either the geometric or the arithmetic mean, whereas the geometric mean is commonly recommended when aggregating individual judgments or pairwise comparison matrices (Forman, Peniwati, 1998; Prusak, Strojny, Stefanow, 2014:189–190). In the present pilot study, the arithmetic mean was adopted to maintain interpretative transparency, direct comparability of normalised individual weight vectors, and an easily understandable preliminary group-level preference structure. At the same time, this solution should be treated as an analytical simplification. Therefore, future studies conducted on larger and more diverse samples should compare the results obtained through different aggregation procedures, including the geometric mean, to assess the robustness of the hierarchy.

The CR metric enabled me to verify the logical consistency of the respondents' judgments. For all the analysed matrixes, the *CR* value remained below the threshold of 0.10. In accordance with the AHP method's assumption, this indicates an acceptable level of judgment consistency. Consequently, I could recognise the obtained assessments as internally consistent and capable of further interpretation within the adopted research project.

The study observed the principles of research integrity and ethics. Respondent participation was voluntary, and the data analysis was anonymous. Still, the adopted approach has limitations stemming primarily from the study's pilot character, the small sample size, the purposive sampling of respondents, and the simplified method of aggregating results. The article's discussion section elaborates on these limitations in greater detail.

Therefore, one should treat the obtained results as a preliminary recognition of student preference structure regarding the quality of educational services, rather than as a representative diagnosis of the entire higher education sector. However, the results do constitute a basis for further research conducted on broader and more diversified samples.

4. Research Results

4.1. Results of the Qualitative Phase

The study's exploratory phase led to the identification of eight main quality criteria for educational services (KG1–KG8), with their detailed operationalisation presented in the article's methodological section (see Table 1 in Section 3.5). The analysis of qualitative material enabled me to determine the main meaning areas of educational services' quality and to capture the initial arrangement of interpretative accents present in the respondents' statements.

At the qualitative level, the respondents most clearly emphasised criteria directly associated with the fundamental teaching process. References to the quality of academic staff's human capital (KG1), as well as the content and modernity of curricula (KG2), recurred in the respondents' statements particularly often. Both of these areas appeared as essential for perceiving the quality of educational services, because they relate to the core of the study experience and directly influence the usefulness of the educational process.

Moreover, the respondents emphasised the significance of technology and digital education (KG3), perceived as an integral element of contemporary educational services. Their statements demonstrate that digital environment efficiency, material availability, the quality of e-learning platforms, and the ability to use digital tools in teaching shifted from an additional element to a crucial dimension of study quality.

Individual stakeholder groups showed substantial convergence in identifying the main quality determinants of educational services, although they differed in interpretative emphases. Students more often highlighted the practicality of curriculum, support accessibility, and the quality of daily study experience. Academic staff paid more attention to the conditions of implementing the teaching process, curriculum consistency, and the possibility to update methods of working with students. By contrast, management staff and experts more strongly emphasised the importance of quality assurance mechanisms, organisational flexibility, and the university's relationship with the socioeconomic environment.

The other criteria also appeared in the empirical material, including those referring to infrastructure and the conditions of the learning environment (KG4), the university's integration with the socioeconomic environment (KG5), student support (KG6), the university's reputation, transparency, and institutional accountability (KG7), and extracurricular activities (KG8). However, compared to KG1–KG3, the respondents approached these criteria as contextual elements, amplifying or complementing the fundamental teaching process. Moreover, the qualitative material demonstrated that the respondents treated some of these areas, especially student support (KG6) and the university's relationship with the socioeconomic environment (KG5), in a more diverse manner, depending on their individual experiences and role in the higher education system.

Thus, the results of the qualitative phase enabled the identification of an initial preference structure, in which factors associated with the academic staff, the curriculum, and the technological teaching environment proved particularly important. These findings constituted a starting point for further, quantitative hierarchisation of the quality criteria for educational services using the AHP method.

4.2. Initial Assessment of Criteria Importance Using the 100-Point Method

At the first stage of the quantitative phase, the respondents performed a direct allocation of importance, distributing a total of 100 points among the eight identified quality criteria for educational services. This procedure had an introductory and exploratory character. Its aim involved capturing the respondents' initial preferences before applying the more structured AHP procedure.

Table 2 presents the results of the individual point distributions for the ten respondents. The obtained values enable one to reconstruct the initial structure of criterion importance and identify areas of relative congruence and divergence in the assessments.

Table 2. Point assessment of the main quality criteria for educational services using the 100-point method

Specification	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
KG1	20	20	20	25	15	10	20	20	25	15
KG2	20	15	20	25	15	20	15	20	15	20
KG3	15	20	20	15	15	15	15	15	20	15
KG4	10	10	10	10	5	10	15	10	15	10
KG5	10	15	10	10	10	10	10	10	5	10
KG6	10	5	10	10	15	15	0	10	20	10
KG7	0	10	5	5	15	10	15	5	0	10
KG8	15	5	5	0	10	10	10	10	0	10

Legend: KG_n – main criterion; S_n – study participant.

Source: own elaboration.

Furthermore, based on the assigned points, I identified individual hierarchical orders, as presented in Table 3.

Table 3. Hierarchisation of the main quality criteria for educational services in the respondents' opinion

Participant	Hierarchisation
S1	KG1 = KG2 > KG3 = KG8 > KG4 = KG5 = KG6
S2	KG1 = KG3 > KG2 = KG5 > KG4 = KG7 > KG6 = KG8
S3	KG1 = KG2 = KG3 > KG4 = KG5 = KG6 > KG7 = KG8
S4	KG1 = KG2 > KG3 > KG4 = KG5 = KG6 > KG7
S5	KG1 = KG2 = KG3 = KG6 = KG7 > KG5 = KG8 > KG4
S6	KG2 > KG3 = KG6 > KG1 > KG4 = KG5 = KG7 = KG8
S7	KG1 > KG2 = KG3 = KG4 = KG7 > KG5 = KG8
S8	KG1 = KG2 > KG3 > KG4 = KG5 = KG6 = KG8 > KG7
S9	KG1 > KG3 = KG6 > KG2 = KG4 > KG5
S10	KG2 > KG1 = KG3 > KG4 = KG5 = KG6 = KG7 = KG8

Legend: KG_n – main criterion; S_n – study participant; "=" – equal importance; ">" – higher importance; the hierarchy excludes the criteria to which the respondents assigned 0 points.

Source: own elaboration.

An analysis of the resulting rankings indicates relatively high judgment consistency in relation to the criteria of highest importance. In most cases, criteria associated with the teaching process occupy the highest positions: staff qualifications, competence, and development (KG1), content and modernity of curricula (KG2), and technology and digital education (KG3). Their relative order varies; nonetheless, precisely these three criteria most often comprise the top of individual rankings. Moreover, one can observe a tendency to assign identical values to several criteria, which resulted in numerous equivalent positions. For instance, in the assessment of respondent S3, three criteria – KG1, KG2, and KG3 – received the same score. Consequently, despite its usefulness in identifying the general direction of preference, the direct point allocation method has limited ability to precisely diversify the relative importance of individual criteria. This limitation constituted a reason for applying the AHP method in the following analysis phase. To synthetically organise the results, I grouped the criteria according to the level of their assigned importance. Table 4 presents this grouping.

Table 4. Synthetic grouping of quality criteria for educational services according to student assessment

Category	Main criteria	Characteristics
Highest rated	KG1, KG2, KG3	Key to effective education
Criterion with the most diverse ratings	KG6	Indicates diverse student needs and experiences
Criteria with a lower level of importance	KG4, KG5, KG7, KG8	Contextual criteria and criteria supporting the educational experience

Source: own elaboration.

The obtained grouping indicates that the criteria directly associated with the teaching process (KG1, KG2, KG3) constitute a clear perception core of educational services' quality already at the stage of initial score assessment. The student support criterion (KG6) occupies an intermediate position, simultaneously characterised by the greatest diversity in individual assessments. The other criteria (KG4, KG5, KG7, KG8) received relatively lower scores, performing a rather contextual function in relation to the fundamental elements of the education process.

The diversity of assessments in terms of the student support criterion (KG6) deserves particular attention, as its values range from 0 to 20 points. Therefore, the results obtained with the 100-point method constitute a useful approximation of the respondents' preference structure. However, due to this method's limited capability to differentiate relative weights, I approached these results as an auxiliary stage prior to the proper hierarchisation of criteria using the AHP method.

4.3. Hierarchisation of Relative Weights Using the AHP Method

The next phase of the analysis involved the application of the AHP method, which allowed for determining the relative weights of quality criteria for educational services based on pairwise comparisons. I provided an individual comparison matrix for each of the ten respondents using Saaty's classic scale. This procedure allowed me to determine the relative intensity of preferences between individual criteria, and then to identify individual weight vectors. Table 5 presents a sample pairwise comparison matrix for respondent S1.

Table 5. Pairwise comparison matrix – input data for respondent S1

Criterion	KG1	KG2	KG3	KG4	KG5	KG6	KG7	KG8
KG1	1	1	3	5	5	5	9	3
KG2	1	1	3	5	5	5	9	3
KG3	0.333	0.333	1	3	3	3	7	1
KG4	0.200	0.200	0.333	1	1	1	5	0.333
KG5	0.200	0.200	0.333	1	1	1	5	0.333
KG6	0.200	0.200	0.333	1	1	1	5	0.333
KG7	0.111	0.111	0.143	0.200	0.200	0.200	1	0.143
KG8	0.333	0.333	1	3	3	3	7	1

Source: own elaboration.

The matrix of respondent S1 demonstrates equal assessment of the KG1 and KG2 criteria, as well as their distinct advantage over the other criteria. The KG3 and KG8 criteria occupy an intermediate position, while the KG4, KG5, KG6, and KG7 criteria demonstrate lower values. This example illustrates the way of transforming comparative assessments into an ordered structure of respondent preferences.

Based on comparison matrixes, I identified normalised weight vectors for each respondent and then evaluated the logical judgment consistency using the *CR* metric.[1] The analysis adopted the standard acceptance criterion for consistency: $CR < 0.10$. For all the analysed cases, the *CR* value remained below the adopted threshold, indicating an acceptable level of the respondents' judgment consistency. Therefore, one can regard the obtained comparison matrixes as consistent enough to constitute a foundation for further analysis of relative weights. For illustrative purposes, Table 6 presents an example of a normalised matrix and values of the consistency metrics for respondent S8.

Table 6. Normalised matrix values and consistency metrics for S8

Specification	KG1	KG2	KG3	KG4	KG5	KG6	KG7	KG8
KG1	0.305	0.305	0.351	0.288	0.288	0.288	0.218	0.288
KG2	0.305	0.305	0.351	0.288	0.288	0.288	0.218	0.288
KG3	0.101	0.101	0.117	0.173	0.173	0.173	0.156	0.173
KG4	0.061	0.061	0.039	0.057	0.057	0.057	0.093	0.057
KG5	0.061	0.061	0.039	0.057	0.057	0.057	0.093	0.057
KG6	0.061	0.061	0.039	0.057	0.057	0.057	0.093	0.057
KG7	0.043	0.043	0.023	0.019	0.019	0.019	0.031	0.019
KG8	0.061	0.061	0.039	0.057	0.057	0.057	0.093	0.057
CI	0.0348							
CR	0.0247							

Source: own elaboration.

The *CR* value for respondent S8 equalled 0.0247, indicating a high level of judgment consistency. In all the other cases, the *CR* value also remained below the 0.10 threshold. The obtained results demonstrate that the respondents proved capable of making relatively consistent judgments despite the considerable number of pairwise comparisons. This constitutes a prerequisite for using the resulting matrixes in further analysis of the relative weights of quality criteria for educational services.

1 The consistency index (CI) and the consistency ratio (CR) serve to assess the matrix consistency of pairwise comparisons as part of hierarchical analysis. These values help determine whether the respondents' assessments prove congruent and reliable.

4.4. The Final Hierarchy of Quality Criteria for Educational Services

The final stage of the quantitative analysis involved the aggregation of individual results to identify group weights, providing the basis for determining the final hierarchy of quality criteria for educational services. Therefore, I averaged the individual weight vectors obtained with the AHP method. Table 7 presents a summary of the results.

Table 7. Summary of relative weights (AHP) for eight quality criteria for educational services

Criterion	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	Average (N = 10)
KG1	0.256	0.257	0.276	0.249	0.232	0.236	0.210	0.214	0.256	0.257	0.244
KG2	0.232	0.232	0.254	0.217	0.225	0.234	0.206	0.233	0.232	0.232	0.230
KG3	0.168	0.173	0.172	0.194	0.203	0.181	0.184	0.180	0.168	0.173	0.180
KG4	0.064	0.066	0.056	0.064	0.071	0.067	0.087	0.081	0.064	0.066	0.068
KG5	0.061	0.060	0.049	0.066	0.059	0.068	0.082	0.071	0.061	0.060	0.064
KG6	0.088	0.089	0.080	0.092	0.091	0.084	0.104	0.094	0.088	0.089	0.090
KG7	0.068	0.067	0.061	0.057	0.060	0.065	0.064	0.070	0.068	0.067	0.065
KG8	0.058	0.053	0.049	0.057	0.055	0.061	0.059	0.054	0.058	0.053	0.056

Note: values appear rounded to three decimal places, so the sum of the average weights may not equal 1.

Source: own elaboration.

The obtained values indicate the relative importance of individual criteria as perceived by the surveyed student group. Based on the average weights, one can identify a hierarchy in which the following criteria ranked highest: staff qualifications, competence, and development (KG1: 24.4%), content and modernity of curricula (KG2: 23%), and technology and digital education (KG3: 18%). The share of these three criteria totals 65.4% of the aggregated weights, which indicates their dominant role in the study respondents' preference structure. This result aligns with the findings from both the qualitative phase and the initial score assessment phase, in which criteria directly associated with the teaching process ranked highest as well.

The student support criterion (KG6) occupies the next position in the hierarchy, reaching a weight of 9%. The other criteria – infrastructure and conditions of the learning environment (KG4: 6.8%), the university's reputation, transparency, and institutional accountability (KG7: 6.5%), the university's integration with the socioeconomic environment (KG5: 6.4%), and extracurricular initiatives and activities (KG8: 5.6%) – received relatively lower weight values. In total, these criteria account for 25.3% of the entire weight structure, which indicates their complementary character in relation to the highest-rated quality determinants.

Based on the obtained results, one could argue that the perception of educational services' quality in the studied sample focuses on three fundamental dimensions: staff competence, curriculum quality, and the technological learning environment. For interpretative purposes, one

can describe this arrangement as the educational triad, encompassing the most important elements of core educational service from the student perspective. Although relatively less significant, the remaining criteria perform a supporting function and cocreate the broader context of the educational experience. Figure 1 illustrates the resulting hierarchy.

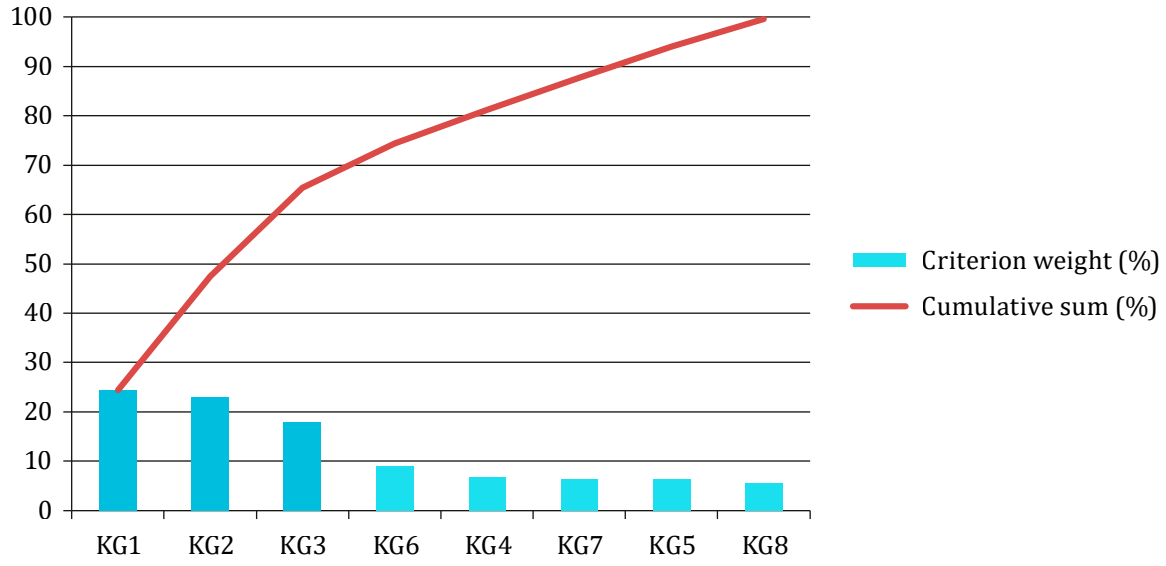


Figure 1. Quality criteria for educational services: hierarchy of importance (AHP)
Source: own elaboration.

5. Discussion

5.1. Interpretation of the Main Findings

The results answer the research problem, indicating that, from the student perspective, the most important quality assessment criteria for educational services offered by Polish universities include staff qualifications, competence, and development (KG1), content and modernity of curricula (KG2), and technology and digital education (KG3). These criteria comprise the quality core of educational services, amounting to 65.4% of the aggregated weights. This result demonstrates that students perceive the quality of educational services as a hierarchical structure dominated by factors directly connected with the teaching process, not as a group of equivalent attributes.

One can interpret the set of the highest-ranked criteria as an educational triad, encompassing interconnected elements of the educational service core: the academic staff's competence, the quality of curricula, and the technological environment supporting the teaching process. In this interpretation, the student remains a direct process recipient and participant, from whose perspective the importance of individual criteria undergoes assessment. Therefore, in the studied sample, the quality of educational services appears as embedded primarily in the everyday experience of studying, rather than in the university's formal or image-related attributes.

The high rank of technology and digital education (KG3) deserves particular attention. The result suggests that the digital component no longer only supports traditional teaching. It has become a fundamental dimension of educational service quality. The quality of studying depends on the efficiency of the digital environment, the accessibility of learning materials, the quality of e-learning platforms, and the integration of digital tools with the teaching process. In this sense, technology has evolved from a mere organisational resource to an element cocreating the educational experience.

The second important finding concerns the student support criterion (KG6). This criterion is not part of the strict quality core, but it achieved the highest weight among the supporting criteria. At the same time, its assessments varied considerably across respondents. This may indicate that students experience support services unevenly, depending on their individual academic and organisational situations. Such services include mentoring, academic counselling, psychological support, and administrative assistance.

The relatively lower weights assigned to infrastructural, relational, institutional, and extracurricular criteria (KG4, KG5, KG7, and KG8) do not mean that these areas remain insignificant for the quality of educational services. Instead, the results suggest that these criteria perform an indirect and contextual role in the core teaching process. Infrastructure, the university's relations with the socioeconomic environment, institutional reputation, and extracurricular activities shape the broader academic experience; however, from the student perspective, they cannot replace the quality of the staff, curriculum, or technological environment.

The relatively low position of the university's reputation, transparency, and institutional accountability (KG7) proves especially interesting. In management and communication practices, reputation often appears as a crucial indicator of the university's quality. However, the results demonstrate that students regard the direct learning experience as more important than the institutional image. Therefore, one should approach promotional and reputational actions as a complement to the actual quality of the educational process, rather than as its substitute.

5.2. Previous Studies and the Contemporary Conditions of Higher Education

The results remain consistent with the mainstream research on quality in higher education, which emphasises the multidimensional and stakeholder-oriented character of quality and the significance of areas such as teaching quality, staff competence, the organisation of the educational process, and the structure of curricula (Harvey, Green, 1993: 3–4, 22–23; Owlia, Aspinwall, 1996; Tsinidou, Gerogiannis, Fitsilis, 2010). The dominance of the KG1 and KG2 criteria confirms that the fundamental quality determinants of educational services relate to the elements directly influencing the learning process and the perceived usefulness of education.

The category of experienced quality proves particularly important from the perspective of result interpretation. This category denotes the quality revealed in students' daily interaction with the staff, the curriculum, the organisation of the educational process, and the technological environment. The high weights assigned to the KG1–KG3 criteria demonstrate that students

assess the quality of educational services primarily through the lens of their direct study experience. This justifies treating students as both recipients of educational services and important participants and verifiers of the quality of university operations.

The high position of technology and digital education (KG3) aligns with the more recent trend of studies that emphasise the growing role of digitisation in higher education. Recent years have demonstrated that the quality of the digital environment, the availability of e-learning platforms, the staff's technological competence, and the ability to efficiently organise online and hybrid classes have become integral components of educational quality (Stecyk, 2018; Shohel et al., 2021; Ober, Kochmańska, 2022; Istenič, 2024). The results of this study confirm that technology no longer appears as an exclusively supporting tool – it has become a crucial element contributing to the quality of educational services.

The diverse assessment of student support (KG6) corresponds with the literature, indicating the growing importance of academic counselling, mentoring, psychological support, and activities reinforcing student well-being. At the same time, the results demonstrate that this area may remain heavily dependent on the institutional context and individual student experiences. Therefore, one should approach student support as an important yet heterogeneously experienced component of educational services' quality, whose significance may grow along with the changing student expectations and the increasing complexity of the study process.

Compared to previous research, the relatively low weight assigned to contextual criteria such as infrastructure, the university's relations with the socioeconomic environment, institutional reputation, and extracurricular activities seems interesting. Some management studies and practices highlight these elements as factors influencing a university's attractiveness, competitive advantage, and recognisability on the education market. However, the results of this study suggest that when directly assessing the quality of educational services, students focus more on the learning experience than on image-related or indirect factors.

Moreover, one can interpret these findings in the context of the contemporary challenges that Polish higher education faces, such as declining birth rates, growing competition between universities, digitisation, and changing student preferences. With the limited organisational, financial, and personnel resources, a simple identification of a broad catalogue of quality factors proves insufficient. Therefore, determining their relative importance becomes crucial, for only a hierarchisation of criteria allows one to better support decisions regarding pro-quality priorities, investments, and the improvement of the learning processes.

In this sense, the results complement the previous approaches, based primarily on the descriptive identification of quality determinants for educational services. These results demonstrate that students perceive quality as hierarchically structured: its core includes the staff's competence, the quality of curricula, and the technological environment, while other areas perform supporting or contextual functions. This approach reinforces the management-related usefulness of quality in higher education research, as it enables the transition from the question 'What influences quality?' to the question 'Which areas of quality should we prioritise?'

5.3. Cognitive and Methodological Contribution of the Study

The article's contribution has a cognitive and methodological character. At the cognitive level, the study demonstrates that one can analyse the quality of educational services in higher education not only as a multidimensional catalogue of determinants but also as a hierarchical structure in which individual criteria display varying significance. The results indicate that students attach key significance to elements connected with the core of the teaching process: the staff's competence, the content and modernity of curricula, and the technological learning environment.

Another crucial element of the cognitive contribution involves the way of identifying the catalogue of quality criteria. Instead of simply adopting criteria a priori based on the literature, I derived them from empirical material collected among various stakeholder groups and then organised them for multi-criteria analysis. This procedure enabled me to integrate the theoretical perspective with the respondents' experience of the educational process, and to enhance the adopted model's relevance to the real-world conditions of university functioning.

At the methodological level, the article presents an approach combining an exploratory qualitative phase with the AHP method. This solution enabled the transition from identifying quality criteria to defining their relative importance. In this sense, AHP application allowed me to transcend classic approaches based on the descriptive cataloguing of quality criteria and move toward a priority model, which can prove useful in the analysis of management issues in higher education. Furthermore, the study has demonstrated that one could apply the AHP method to analysing student perception in relation to complex quality categories. Confirmed by *CR* values below the 0.10 threshold, the consistency of judgments indicates that the respondents managed to formulate assessments that proved congruent enough for further analysis despite the relatively large number of pairwise comparisons. This validates the usefulness of AHP as a tool supporting the hierarchisation of quality criteria for educational services.

Therefore, the contribution of the study should be interpreted cautiously. It does not consist in proposing a new theoretical model of educational service quality or in developing a new multi-criteria method. Rather, its value lies in applying the AHP method to an empirically identified set of quality criteria and in using this procedure to organise them into a priority structure from the student perspective. In this sense, the study moves beyond a descriptive catalogue of quality determinants and indicates which criteria have the greatest relative importance in the studied sample. This exploratory cognitive and practical contribution increases the usefulness of the results for management and quality sciences, as it supports the transition from identifying quality-influencing factors to determining their relative importance for pro-quality decision-making.

5.4. Implications for Quality Management Theory and Practice

The results indicate the need to conceptualise the quality of educational services as a system with a diversified structure of importance. Thus, one should approach individual quality dimensions as elements with varying importance for the student experience and the efficiency of quality management processes. For the theory of quality management in higher education, the transition from a catalogue approach to a hierarchical approach proves crucial. The former involves identifying the list of quality determinants, while the latter enables one to determine individual criteria's relative weight.

From the perspective of university management practice, the results suggest that pro-quality actions should focus on the quality core of educational services, including staff competence, the relevance and modernity of curricula, and the quality of the digital environment. In the studied sample, these areas ranked highest; therefore, one should treat them as a priority in quality improvement processes, strategic planning, and organisational, financial, and personnel resource allocation. In practice, this means the need to invest in the development of the staff's teaching and digital competence, systematic updating of curricula and a reliable, accessible, and functional technological environment supporting the learning process. More specifically, the obtained hierarchy may support universities in translating general student opinions into managerial priorities. First, staff development policies should include not only research and professional competences but also teaching, digital, and communication competences. Second, curriculum reviews should focus on the topicality, coherence, and labour-market relevance of study programmes. Third, investments in the digital environment should be treated as part of educational service quality, not merely as technical infrastructure. Fourth, student support should be monitored as a separate quality dimension, because its assessment is more diverse and may depend strongly on individual student experiences. Finally, the hierarchy of criteria may help universities allocate resources more transparently by indicating which areas require priority intervention and which play a supporting or contextual role.

Moreover, the results indicate that promotional, reputational, and infrastructural activities, although important, should not replace investments in the fundamental elements of the teaching process. Given the limited management resources, the resulting hierarchy of criteria can serve as a tool supporting decisions concerning the order and intensity of pro-quality actions.

The student support area demands particular attention. On the one hand, this criterion failed to enter the strict core of quality criteria; on the other hand, it ranked highest among the other supporting criteria and displayed substantial diversity of assessments. For management practice, this means the need to increase the availability, consistency, and visibility of supporting services, such as academic and professional counselling, tutoring, mentoring, psychological support, and administrative assistance. This area can function as a factor differentiating student experience, especially in crisis situations or in the case of students with more complex educational and organisational needs.

The lower position of contextual criteria – including infrastructure, the university's integration with the socioeconomic environment, institutional reputation, and extracurricular activities – does not imply their marginal significance. Rather, the results demonstrate that these criteria fulfil a supporting function to the fundamental educational process. In quality management practice, one should develop these aspects as elements which enhance the overall academic experience and construct the university's long-term attractiveness and its relationships with the environment. However, they cannot serve as a substitute for the quality of the staff, curriculum, or technological environment.

One can utilise the resulting hierarchy in designing and improving university quality assurance systems. In this context, the results may facilitate the construction of more organised quality monitoring mechanisms in which student opinions serve not only as statements of satisfaction but also as data supporting the decision-making processes. This approach aligns with the logic of quality management based on continuous improvement, process analysis, and stakeholder participation in identifying areas for improvement.

At the systemic level, one can associate the results with the European framework for quality assurance in higher education, in particular the ESG standards, and with the approaches that emphasise the development of internal quality systems and participatory university management. In this sense, the results support the need to establish quality mechanisms that combine the perspectives of students, the academic staff, and the management personnel, while enabling a more transparent definition of pro-quality priorities.

Moreover, one can interpret the results in light of the process approach present in the continuous quality improvement (CQI), TQM, and EFQM concepts. From this perspective, the quality of educational services does not constitute a one-time effect of a university's actions. Instead, it represents a result of continuous improvement of teaching, organisational, and supporting processes, requiring engagement on the part of university authorities, staff, students, and other stakeholders (Zalewska, 2024:34–44). Therefore, the hierarchisation of criteria can provide a starting point for periodic quality audits, curriculum reviews, assessment of the staff's teaching competence, and monitoring of the digital environment quality.

As a consequence, the results demonstrate that the AHP method could serve as a useful tool supporting quality management at universities. The method enables both the identification of quality criteria and the determination of their relative importance. This fact proves particularly important in conditions of limited resources and the need to make prioritising decisions. Thus, the hierarchy of criteria may support more rational planning of pro-quality actions, increase the transparency of management decision, and enhance the connection between quality assessment and the practice of improving educational services. The AHP procedure may also be used periodically, for example, as part of internal quality audits, programme reviews, strategic planning processes, or evaluations of student support systems. Repeating the analysis in subsequent years would allow universities to observe whether the hierarchy of quality criteria changes under the influence of demographic, technological, or organisational conditions.

5.5. Study Limitations and Directions for Further Research

The study had an exploratory and pilot character; therefore, its results should be interpreted with caution. The most important limitation concerns the small size of the quantitative sample, its purposive and nonrepresentative nature, and the focus on the student perspective. The sample of $N = 10$ made it possible to verify the usefulness of the AHP procedure and to obtain a preliminary hierarchy of preferences, but it does not allow for statistical generalisation to the entire student population in Poland or to the whole higher education sector.

Another research limitation involves the lack of detailed respondent metrics, such as gender, age, year and level of study, type of university, form of study, or international experience. This lack prevents in-depth comparative analyses between various categories of students and limits the assessment of sample differentiation. As a result, the study cannot determine whether the hierarchy of preferences differs between student subgroups with different academic profiles or institutional experiences.

Furthermore, the study had an identificatory and hierarchising character. I aimed to identify quality criteria for educational services and determine their relative importance, rather than to analyse the cause-and-effect relationships between individual criteria. Thus, the obtained hierarchy indicates the preference structure of the studied sample, but it does not explain the influence mechanisms of individual factors on student satisfaction, educational efficiency, or the university's organisational performance.

Another limitation concerns the result aggregation procedure. The study adopted the arithmetic mean of individual weights, a solution justified by the pilot nature of the analysis and the need to maintain interpretative transparency. However, future research should consider comparing results obtained through various aggregation methods, including the geometric mean, especially when aggregating comparison matrixes.

Future research should expand the studied sample and include students from various types of universities, levels of study, disciplines, and regions. This approach would increase the interpretative scope of the results and verify whether the identified hierarchy of quality criteria prevails in more diverse institutional and social conditions. Comparisons between public and private universities, academic and practical fields, and various forms of study would prove especially valuable.

Moreover, a crucial direction for further analysis would consider the perspective of other stakeholders, such as academic staff, management staff, university administration, graduates, and employers. This approach would enable a comparison of priority structures between groups and determine the extent to which the understandings of educational services' quality converge or differ depending on one's role in the higher education system.

Furthermore, researchers should consider conducting a longitudinal study to observe changes in the hierarchy of quality criteria over time, especially in the context of ongoing digitisation, demographic changes, the development of hybrid teaching models, and evolving student

expectations. Such research would reveal whether the educational triad identified herein remains relatively stable or undergoes transformations under the influence of organisational and technological changes.

Finally, further research should employ other multi-criteria methods and mixed approaches, which would facilitate an in-depth analysis of relationships between quality criteria. An interesting option involves a comparison of the results obtained through the AHP method with results of other decision-supporting methods, such as PROMETHEE, TOPSIS, or DEMATEL, applied to analyse complex decision-making problems and organise variants according to multiple criteria (Trzaskalik, 2014:239–247, 259–260). This comparison would reinforce the methodological accuracy of future analyses and develop more advanced models supporting the quality management of educational services in higher education.

6. Conclusions

The study identified and hierarchised the main criteria for assessing the quality of educational services offered by Polish universities from the student perspective. The results demonstrate that the core perception of quality comprises three criteria: staff qualifications, competence, and development, the content and modernity of curricula, along with technology and digital education. Therefore, the quality of educational services undergoes assessment primarily through direct determinants of the educational process, and not solely through contextual, infrastructural, or image-related factors.

The study results confirm that the quality of educational services has a multidimensional character; however, this does not imply that all the dimensions are equal. From the student perspective, quality adopts a hierarchical structure which assigns particular importance to the educational triad: the staff, the curriculum, and the technological environment. This finding has cognitive importance, for it shifts the key focus from the mere identification of quality determinants to the definition of their relative significance.

The varying status of student support represents another significant finding. This criterion failed to enter the core quality criteria, but it emerges as the highest rated supporting factor, and as the most diverse in terms of individual assessments. This result suggests that student support may constitute an important factor differentiating educational experiences and demands a more systemic approach in university quality policies.

The lower rankings of infrastructure, relations with the socioeconomic environment, institutional reputation and accountability, and extracurricular activities do not render these areas insignificant. Instead, these criteria perform a supporting and contextual function in the core teaching process. In practice, they can reinforce the overall academic experience, but cannot replace the quality of the staff, the curriculum, or the digital environment.

The study's contribution to the present state of knowledge involves primarily the empirical organisation of quality criteria for educational services and the determination of their relative importance in the Polish context of higher education. The article expands previous

research on the quality of education and educational services, shifting the focus from identifying quality determinants to their hierarchisation. In this sense, the study contributes to management and quality sciences by demonstrating that multi-criteria approach could prove useful for the analysis of complex organisational issues associated with university functioning.

The practical importance of the results involves their potential application in management processes, especially where universities must make decisions with limited resources. The resulting hierarchy demonstrates that pro-quality and investment actions should prioritise developing the staff's educational and digital competence, systematic updating and improvement of curricula, and enhancing the digital environment that supports the educational process. In the second place, one should pay particular attention to student support, especially regarding the accessibility and coherence of counselling, mentoring, psychological, and administrative services.

The study had an exploratory and pilot character; therefore, one should interpret its results as a preliminary identification of the hierarchy of quality criteria for educational services, not as a representative examination of the entire higher education sector. Despite this limitation, the results confirm the usefulness of the AHP method in identifying and hierarchising quality criteria from the student perspective. Moreover, the results open the possibility of further research encompassing larger and more diverse samples, different types of universities, various fields of study, and a broader range of stakeholders.

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Hierarchizacja kryteriów oceny jakości usług edukacyjnych w polskich uczelniach wyższych z perspektywy studentów. Analiza metodą AHP

Streszczenie: Celem artykułu jest identyfikacja oraz hierarchizacja głównych kryteriów oceny jakości usług edukacyjnych w polskich uczelniach wyższych z perspektywy studentów. Badanie odpowiada na potrzebę określenia relatywnego znaczenia poszczególnych wymiarów jakości, co może wspierać procesy decyzyjne w zarządzaniu jakością uczelni. Badanie miało charakter eksploracyjno-pilotażowy i zostało przeprowadzone w dwóch etapach. W fazie jakościowej, obejmującej wywiady grupowe, indywidualne wywiady pogłębione oraz analizę treści, wyłoniono osiem głównych kryteriów jakości usług edukacyjnych. W fazie ilościowej zastosowano metodę analitycznego procesu hierarchicznego (AHP) na próbie celowej $N = 10$ studentów, dokonując porównań parami oraz weryfikując spójność osądów za pomocą wskaźnika *CR*. Wyniki pokazują, że najwyższe wagi uzyskały: kwalifikacje, kompetencje i rozwój kadry akademickiej (24,4%), zawartość i nowoczesność programów nauczania (23%) oraz technologia i edukacja cyfrowa (18%). Kryteria te tworzą rdzeń jakości

usług edukacyjnych z perspektywy badanej próby. Wsparcie dla studentów zajęło pozycję pośrednią i charakteryzowało się większym zróżnicowaniem ocen, natomiast kryteria infrastrukturalne, instytucjonalne i pozadydaktyczne zajęły niższe pozycje w hierarchii. Uzyskane wyniki wskazują, że jakość usług edukacyjnych ma strukturę hierarchiczną, a metoda AHP może być użytecznym narzędziem wspierającym identyfikację priorytetów projakościowych, planowanie działań doskonalących oraz alokację zasobów w uczelniach.

Słowa kluczowe: jakość usług edukacyjnych, szkolnictwo wyższe, zarządzanie jakością, metoda AHP, kryteria jakości, studenci