

Competency-based evaluation of scientific-pedagogical master's programs

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ABSTRACT

The goal of this study is to conduct a comprehensive evaluation of the master's degree programs at the Faculty of Philosophy and Political Science of Al-Farabi Kazakh National University from the perspective of the competency-based approach. The study involves a targeted sample of 120 participants directly involved in the implementation and evaluation of scientific and pedagogical master's programs: 70 master's students, 20 teachers, 20 graduates, and 10 employers. The study employs a mixed-method approach, including surveys of master's degree students, faculty members, graduates, and employers, as well as qualitative analysis of interviews with participants. Course relevance received the highest rating. Faculty members positively evaluate the alignment of the programs with the competency-based approach. Graduates emphasize the applicability of their knowledge, while employers express satisfaction with the graduates' level of preparation. Kruskal–Wallis test analysis does not reveal statistically significant differences between groups for most indicators, confirming a consistent perception of educational quality. The interviews reveal a generally positive attitude toward the programs but highlighted several shortcomings, such as uneven competency development, insufficient practical focus, and limited engagement with the professional environment. The novelty of the work lies in the comprehensive empirical evaluation of master's programs based on a competency-based approach from the perspectives of students, teachers, graduates, and employers. The practical significance of the findings lies in justifying the need for stronger integration of theory and practice, greater transparency in competency assessment, and expanded collaboration with employers to enhance the quality of master's degree training.

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1. INTRODUCTION

Modern higher education is undergoing a transformation driven by the need to train professionals capable of effectively functioning in a dynamic and globalized labor market [1]. Global competence has become crucial in contemporary society. Future teachers must be able to teach effectively in multicultural classrooms while also fostering social competence skills in their students [2]. Global competence is a multidimensional concept essential to the teaching profession, incorporating collaboration, inclusivity,

social engagement, and multicultural dialogue [3], [4]. In this context, the competency-based approach emerges as a key direction in modernizing educational programs, preparing graduates to meet employer demands and strengthen their competitiveness [5]. Within the framework of this study, the competency-based approach is viewed as a set of operationalizable criteria that enable the assessment of the outcomes and processes of the master's program implementation.

Previous research shows that many master's programs do not sufficiently integrate a competency-based approach into curricula, which creates gaps between academic knowledge and students' practical skills [6], [7]. Despite the existence of previous studies, most of them focused either on normative analysis of educational standards or on the evaluation of individual courses, without conducting a comprehensive empirical evaluation of the program as a holistic educational system that takes into account the opinions of all key stakeholders. In this study, analysis is used to describe and interpret the structural and content characteristics of the program, while evaluation aims to determine its degree of success according to predefined criteria. The literature also remains limited in studies that align master's training outcomes with the actual requirements of employers, specifically within the scientific and pedagogical domain. The present study addresses these gaps through a multi-faceted empirical evaluation of the program and the integration of perspectives from master's students, faculty members, graduates, and employers. The criteria for the program's success are determined by its compliance with the principles of the competency-based approach, the level of professional competence development among students and graduates, the satisfaction of key stakeholders, and the alignment of training with labor market requirements.

The implementation of the competency-based approach in Kazakhstan's higher education follows the standards of the Bologna Process and the European Qualifications Framework. The structure of curricula is based on modular systems and learning outcome assessments in terms of knowledge, skills, and competencies [8]. Such transformation aims to align educational programs with labor market requirements and international standards [9].

This study is empirical and contextual in nature and consists of a comprehensive assessment of the implementation of the competency-based approach in scientific and pedagogical master's programs within the national higher education system of Kazakhstan. This assessment involves comparing educational quality perceptions across four key stakeholder groups: master's degree students, faculty members, graduates, and employers. The tools and indicators used in the study are based on adaptations of existing methodological approaches and conceptual models used in international studies of education quality. The methodological contribution is achieved through data triangulation, combining the analysis of regulatory documents, expert assessment, quantitative surveys, and qualitative interviews, as well as through the development of a reproducible evaluation instrument that can be applied to the analysis of master's program at other universities with comparable competency structures; as well as through empirical testing of reproducible assessment tools in a specific institutional context. The conceptual significance of the study is limited to clarifying and practically testing the applicability of existing competency models and program evaluation criteria for assessing competency-based master's programs, confirmed by intergroup comparisons using statistical methods. The authors propose a standardized survey instrument that enables the reproducible measurement of gaps between students' self-assessments, evaluations by faculty members and graduates, and employers' expectations.

2. LITERATURE REVIEW

Research on competency-based approaches in higher education reveals a diversity of models and practices and serves as a basis for analyzing the alignment of master's programs with stated competencies. An important area of focus is developing teachers' communicative awareness, encompassing social, psychological, and pedagogical skills. Communicative awareness includes the ability to manage interpersonal dynamics and adapt to diverse social roles which is considered a measurable component of the professional competence of master's program graduates in the field of education [10]. In this context, leadership and well-defined competency structures within teacher education curricula are critical for the successful adoption of competency-based learning models and serve as criteria for institutional program evaluation [11]. However, even with a general pedagogical framework, discipline-specific refinement of professional skills remains necessary which indicates a gap between formally stated competencies and their actual implementation in educational programs [12]. Pedagogical competencies are a fundamental prerequisite for educational effectiveness, and standardized methods for acquiring these competencies should become integral to teacher training programs which is directly related to the task of evaluating the content and structure of master's programs [1].

The digitalization of educational environments is recognized as a factor that fundamentally transforms teachers' professional self-evaluation. Digital tools both create opportunities for professional

growth and necessitate a rethinking of roles and pedagogical strategies which makes digital competencies an important subject of assessment in scientific and pedagogical master's program [13]. The hybrid flexible model has emerged as an effective framework for integrating face-to-face and distance learning, adapting to the diverse circumstances of master's degree students and is used as an indicator of the adaptability of programs to modern educational requirements [14]. Fostering digital literacy and the ability to understand mitigation mechanisms contributes to the development of students' critical thinking skills which is included in the list of assessed professional competencies [4].

Teachers at pedagogical universities in Kazakhstan recognize the importance of global competencies, which emphasizes the need for empirical assessment of the actual level of competence development among master's students and graduates [15]. The formation of global competencies in future teachers requires interdisciplinary knowledge, but educational constraints and lack of practice remain serious obstacles which is taken into account when analyzing stakeholder satisfaction with program quality [16], [17]. At the same time, new information technologies increase knowledge integration, the quality of material assimilation, and the level of professional competencies, improving individual educational outcomes [18], [19].

The development of global competencies among educators, especially in scientific and pedagogical master's programs, is most effective when combined with methodological support, seminars, structured modular training, and practices that encourage scientific thinking, collaboration, and autonomous learning [20], [21]. This sets the benchmarks for evaluating educational technologies and teaching methods in the programs under review. At the same time, conceptual differences in the interpretation of competence remain, making it difficult to standardize curricula and requiring flexible, context-oriented assessment mechanisms [22]. Another problem remains the difference between the academic and professional approaches to assessing competency, as well as between training objectives and the actual readiness of graduates to work in a sociocultural diverse environment [3], [23]. The effective application of competency models requires the harmonization of standards with practice and the restructuring of institutional mechanisms, including the roles, incentives, and professional development of educators [24].

Cultural and institutional Kazakhstan-specificities transform imported pedagogical approaches, highlighting the need to consider local conditions when designing programs [25]. This is particularly important for evaluating programs within the Kazakhstani higher education system. International initiatives foster not only inter-university collaboration but also the adaptation of educational models to European standards without radical legislative reforms. This approach holds particular value for countries with transitional education systems [26]. This highlights the need for a critical assessment of scientific and pedagogical master's programs from the perspective of their alignment with the competency-based approach, stakeholder expectations, and labor market requirements, with an emphasis on structural improvements consistent with the competency-based approach.

This study aimed to conduct a comprehensive assessment of scientific-pedagogical master's degree programs at the Faculty of Philosophy and Political Science of Al-Farabi Kazakh National University, focusing on competency-based principles. The research hypothesis was formulated as: master's programs of the Faculty of Philosophy and Political Science of Al-Farabi Kazakh National University comply with modern competency principles, ensure the development of professional competencies of graduates, and meet the expectations of key stakeholders, including students, teachers, and employers. The study addressed the following research objectives:

- Assessing the compliance of the content and structure of master's degree programs at Al-Farabi Kazakh National University with the competency-based approach.
- Analyzing the satisfaction of educational stakeholders (students, faculty, and graduates) with program content, teaching methods, and graduate preparedness.
- Evaluating the level of professional competencies among master's degree students and graduates of Al-Farabi Kazakh National University.
- Examining the alignment of master's degree programs offered by the university with labor market demands from the perspectives of faculty and employers.

3. METHOD

3.1. Research design

This study employed a mixed-methods approach. The selection of a mixed-methods design was driven by the need to integrate generalizable quantitative indicators with in-depth analyses of participants' individual experiences and professional interpretations. The quantitative phase made it possible to identify levels of competency development and the degree of agreement in evaluations across stakeholder groups through survey data. The qualitative phase, in turn, was aimed at explaining the observed statistical patterns, elucidating the sources of discrepancies, and clarifying the underlying mechanisms through which the

competency-based approach is implemented, based on interview data. The research design followed the logic of program evaluation research and was conceptually grounded in the context–input–process–product (CIPP) model [27], which enabled a systematic assessment of master’s programs across four interrelated dimensions. The context component involved an analysis of regulatory documents and the institutional environment in which the programs were implemented; input encompassed an evaluation of program structure, available resources, and the stated learning outcomes and competencies; process focused on the analysis of teaching methods, assessment mechanisms, and instructional practices; and product addressed the evaluation of competency development, participant satisfaction, and graduates’ readiness for professional practice.

3.2. Participants

The study involved a purposive sample of 120 participants directly engaged in implementing and evaluating scientific-pedagogical master’s degree programs at the Faculty of Philosophy and Political Science of Al-Farabi Kazakh National University. The sample included master’s degree students, faculty members, graduates, and employers affiliated with the faculty’s social sciences and humanities programs. Participant selection followed purposive sampling to ensure data representativeness within the chosen academic environment. Current master’s degree students and faculty members were invited based on their active involvement in master’s degree programs. Graduates were recruited from faculty databases, with support provided by the university’s departments. Employers were selected from partner organizations that regularly accept students for internships, practicums, or employment.

Inclusion criteria: master’s degree students (second-year enrollment in relevant programs); faculty members (participants in curriculum development or course delivery); graduates (individuals who completed the program within the last 3 years); employers (with experience working with graduates from these programs). Exclusion criteria: no direct involvement in the programs; irrelevant participation in educational processes; ethical or personal refusal to participate. Table 1 provides detailed demographic characteristics of the study participants.

The sample size and the distribution of participants across groups were determined in line with the logic of program evaluation research and the CIPP model, which requires consideration of key stakeholder perspectives at both the implementation and outcome stages of educational programs. The quantitative predominance of master’s students reflects their central role as the direct recipients of educational services. The size of the employer group (n=10) corresponds to the limited number of relevant organizations that systematically interact with graduates of these programs and is considered adequate for identifying stable evaluative judgments regarding graduates’ professional readiness within the qualitatively oriented component of the study. Likewise, the numbers of graduates and employers were deemed sufficient to obtain expert and comparative assessments within the mixed-methods research design.

Table 1. Participant characteristics

Category	Number of participants	Male	Female	Mean age	Age range
Master’s degree students	70	30	40	28.3	23–35
Faculty	20	8	12	42.5	34–58
Graduates	20	9	11	29.8	25–37
Employers	10	6	4	39.1	33–48
Total	120	53	67	—	—

3.3. Research instruments

This study employed a comprehensive set of data collection and analysis methods to ensure a multidimensional and thorough evaluation of master’s degree programs. The selection of instruments was directly related to the components of the CIPP model and the evaluation objectives of the study. An expert evaluation methodology was employed, involving six independent experts in the fields of professional counseling, sociology, and educational program development. The experts used a 10-point scale to assess the completeness of competencies, alignment with program objectives, coherence between content and assessment instruments, practical orientation, and interdisciplinarity. Expert scales were developed based on the same construct domains as the survey instruments, ensuring consistency of measurement and reducing the risk of methodological fragmentation. The results were subjected to statistical analysis, and the selection of experts based on their professional experience ensured the robustness of the findings.

Quantitative data collection was carried out through surveys administered to four groups of participants: master’s degree students, faculty members, graduates, and employers (Appendix A). All 120 participants were involved in the survey. Data collection was completed within one week. The questionnaire comprised 15 closed-ended items utilizing a 5-point Likert scale (1=strongly disagree to 5=strongly agree).

The survey instrument was developed using well-established frameworks in competency-based education [28]–[30]. Reliability analysis using Cronbach's alpha yielded $\alpha=0.88$, indicating a high internal consistency of the scales.

To obtain qualitative data, semi-structured interviews were conducted with 35 master's degree students, 10 faculty members, 10 graduates, and 5 employers (Appendix B). The interview sample included 50% of each pre-identified participant group, ensuring a balanced and representative cohort while accounting for limited resources, time constraints, and the inherent requirements of qualitative methodology that demand detailed analysis of each interview. The interviews were conducted both in-person and online, each lasting approximately 30 minutes. All interviews were recorded with participants' consent and subjected to thematic content analysis. The interview questions demonstrated sufficient reliability, with a Cronbach's alpha coefficient of 0.79.

3.4. Research procedure

The study was conducted in stages. There were only three research stages. The description of the stages is shown in Figure 1. The initial phase involved an analysis of documents pertaining to scientific-pedagogical master's programs at the Faculty of Philosophy and Political Science of Al-Farabi Kazakh National University. The sample included syllabi, course curricula, assessment tools, program self-evaluation reports, department meeting minutes, and teaching materials.

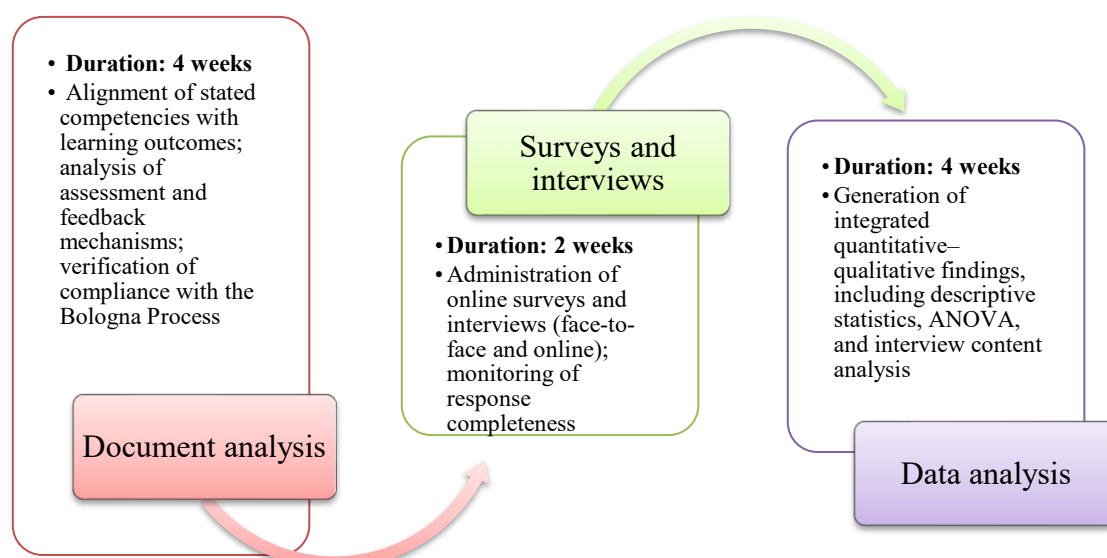


Figure 1. Research stages

To enhance constructive validity, the analysis of documents was conducted based on the correspondence matrix “learning outcomes, formulated competencies, and assessment tools”, which made it possible to verify the compliance of the theoretical concept of the competency-based approach and its practical implementation. The data were evaluated for conformity with the core principles of the competency-based approach as outlined in the Bologna Declaration and Kazakhstan's National Qualifications Framework. Documents for analysis were selected based on their direct relevance to the educational process and official approval by the faculty, which ensured their validity and representativeness.

The next phase involved administering questionnaires to master's degree students, faculty members, graduates, and employers. Separate questionnaires were developed for each category of participants, consisting exclusively of closed-ended questions. The surveys were distributed online via Google Forms and required up to 20 minutes to complete. Following the survey, a series of semi-structured interviews was conducted with representatives from all four groups.

3.5. Data analysis

The survey data collected from all participants were entered into spreadsheets and processed using SPSS and Microsoft Excel software. The analysis began with descriptive statistics, calculating absolute and relative response frequencies as well as mean values for each question. Standard deviation and coefficient of

variation (CV) were used to assess response variability. For the 5-point scale items, mean scores were calculated for each statement, enabling conclusions about satisfaction levels and perceptions of the competency-based approach. For between-group comparisons of outcomes, the nonparametric Kruskal–Wallis test (H test) was employed. The choice of this method was justified by the ordinal nature of the Likert-scale data, differences in measurement instruments used for the respective participant groups, and a pronounced imbalance in sample sizes ($n=70$ for master's students versus $n=10$ for employers), which limits the applicability of parametric procedures. For the purposes of the evaluative analysis, program success criteria were defined a priori. These criteria were treated as a central component of the evaluation design and included: i) attainment of a threshold mean score ($M \geq 3.8$); ii) consistency of assessments across stakeholders ($CV \leq 25\%$); iii) absence of statistically significant differences between key groups ($p > 0.05$ according to the Kruskal–Wallis test); and iv) corroboration of quantitative findings through thematic analysis of interview data.

The semi-structured interview data were analyzed through thematic content analysis. This analytical method involves systematic identification, coding, and categorization of key themes and patterns within interview transcripts. Initially, all transcripts were carefully reviewed to examine the content and identify recurring ideas and concepts. A coding framework was then developed to structure and classify data according to the study's main research directions. During the analysis, particular attention was paid not only to the frequency of mentioned aspects but also to their contextual meaning, emotional tone, and significance to respondents. Qualitative analysis was conducted in several stages and included open, axial, and selective coding. Primary (open) coding was performed independently by two authors, followed by code comparison; discrepancies were discussed until consensus was reached. At the axial coding stage, the codes were grouped into thematic categories related to predefined program success criteria (competency development, practical orientation, readiness for professional activity). Selective coding allowed us to identify key interpretive themes reflecting agreed-upon and problematic aspects of program implementation.

3.6. Ethical considerations

All participants were informed about the aims and procedures of the study and provided written informed consent, with the right to withdraw at any stage. Data were collected anonymously, processed in aggregated form, and stored in encrypted format with restricted access limited to the research team. Throughout the study, principles of confidentiality and non-discrimination were strictly observed.

3.7. Limitations

A sample limited to a single faculty reduces the generalizability of the findings. Self-reported survey data are subject to bias and social desirability effects, while the limited number of interviews increases the influence of individual perspectives. In addition, expert evaluations based on documentation do not fully capture actual informal educational practices.

4. RESULTS

Figure 2 presents the key findings of the document analysis. As shown in Figure 2, that competencies are formally integrated; however, their linkage to course content and learning outcomes is often declarative. Assessment methods predominantly evaluate theoretical knowledge, while practical assessment is implemented in a fragmented manner. Courses and assessment criteria insufficiently account for professional contexts, real-world cases, and engagement with employers. A strong emphasis on theoretical instruction prevails alongside the limited use of active learning methods, which constrains the development of key competencies. Moreover, most programs do not include modules on digital literacy, online tools, or inclusive education.

Table 2 presents the average ratings from master's degree students, faculty members, graduates, and employers regarding the key parameters of scientific-pedagogical master's programs based on the competency-based approach. The survey responses of master's degree students averaged between 3.8 and 4.2 across most indicators, reflecting generally positive perceptions of the programs. The highest rating was given to course relevance (4.2), indicating alignment between curriculum content and professional needs. Satisfaction with program content (4.1) and the effectiveness of teaching methods (4.0) also received high marks. Professional competency development averaged 4.0, with moderate response variability (23.0%). The lowest scores were recorded for assessment objectivity (3.8) and the clarity of learning objectives (3.9), pointing to the need for improved evaluation mechanisms and greater transparency in goal-setting. These indicators also showed the highest response variability. Elective course options received strong ratings (4.1) with minimal variation, reflecting consistent perceptions of choice flexibility in elective courses. The practical orientation of instruction scored 3.9, indicating a demand for more practice-based components.

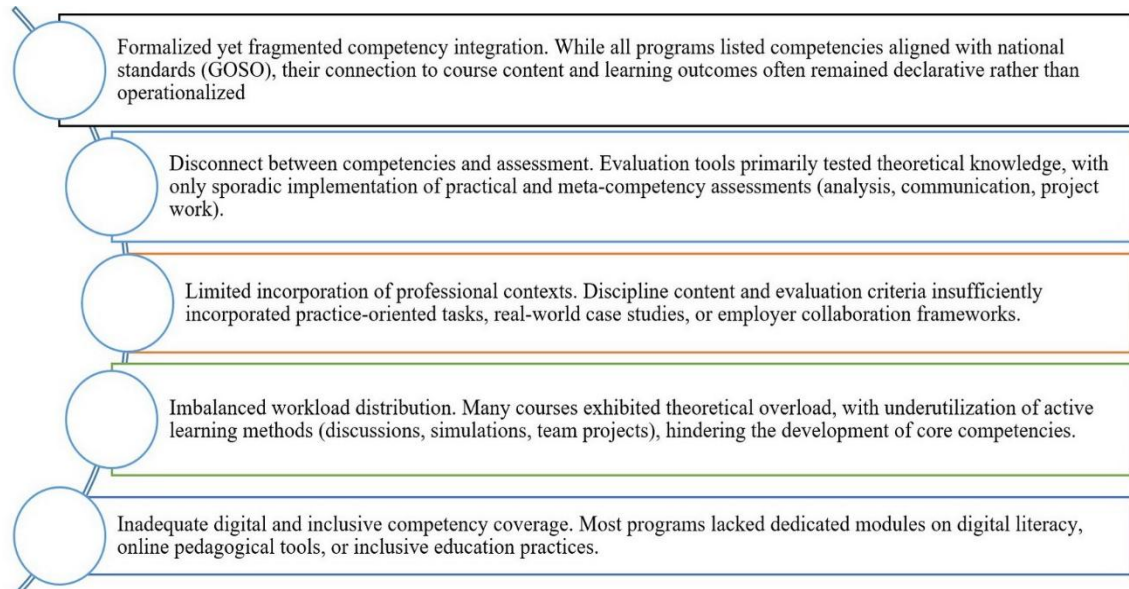


Figure 2. Document analysis results

Table 2. Survey results by participant group

	Indicator	Mean	SD	CV (%)
Master's degree students	Satisfaction with program content	4.1	0.85	20.7
	Development of professional competencies	4.0	0.92	23.0
	Relevance of disciplines	4.2	0.78	18.6
	Clarity of learning objectives/outcomes	3.9	0.97	24.9
	Effectiveness of teaching methods	4.0	0.89	22.2
	Assessment objectivity	3.8	1.04	27.4
	Alignment with student expectations	4.0	0.86	21.5
	Availability of elective courses	4.1	0.77	18.3
	Practical orientation of instruction	3.9	0.93	23.8
	Faculty members accessibility	4.1	0.82	20.0
Faculty members	Development of critical thinking	4.0	0.84	21.0
	Adherence to competency-based principles	4.3	0.69	16.0
	Contribution of the disciplines to pedagogical/research competencies	4.1	0.73	17.8
	Effectiveness of teaching methods	4.2	0.67	15.9
	Objectivity of methods used to assess master's degree students	4.0	0.82	20.5
	Overall program quality	4.2	0.68	16.1
	Satisfaction with resources	3.9	0.88	22.6
	Opportunities for professional development	4.2	0.74	17.2
	Research integration in teaching	4.0	0.85	21.3
	Assessment of motivation of master's degree students	3.8	0.91	23.9
Graduates	Program adaptability to changing requirements	4.1	0.76	18.5
	Applicability of knowledge to professional practice	4.0	0.83	20.8
	Preparedness for professional practice	3.9	0.87	22.3
	Curriculum alignment with professional requirements	3.8	0.91	23.9
	Levels of competency development	3.9	0.94	24.1
	Satisfaction with the quality of education	4.1	0.81	19.8
	Employment in field of study	3.9	0.89	22.8
	Availability of internships/practicums	4.2	0.74	17.6
	Career support from the university	3.7	0.96	25.9
	Assessment of key skill development	4.0	0.82	20.5
Employers	Intention to pursue further education	4.1	0.79	19.3
	Satisfaction with professional training	4.0	0.79	19.7
	Level of professional competencies	3.9	0.83	21.3
	Communication and presentation skills	3.8	0.92	24.2
	Readiness for independent work	3.9	0.85	21.8
	Overall preparation level of graduates	4.1	0.74	18.0
	ICT and digital literacy skills	4.0	0.80	20.0
	Importance of professional competencies	4.3	0.70	16.3
	Adaptation to corporate culture	3.8	0.90	23.7
	Willingness to collaborate with the university	4.0	0.76	18.1
	Interest in co-developing programs	3.9	0.85	21.8

Master's graduates generally expressed positive evaluations regarding the applicability of acquired knowledge (4.0) and their professional readiness (3.9). Internship/practicum components and willingness to pursue further education received particularly high ratings (4.2 and 4.1, respectively). The alignment between curriculum content and professional requirements was rated lower (3.8), indicating a need for enhanced program content. Graduates assessed their competency development at 3.9 points, while overall satisfaction with the quality of education scored 4.1, reflecting generally high approval levels. CV (20-24%) demonstrate opinion diversity attributable to individual experiences and backgrounds. Employment averaged 3.9, skill development scored 4.0, and career support from the university received the lowest rating (3.7), revealing a clear demand for strengthened career opportunities.

Figure 3 presents the survey results for dichotomous (yes/no) questions. Regarding professional orientation, 67% of master's degree students confirmed their intention to work in their field of study, validating the practical focus of the educational programs. Among faculty respondents, 62% noted the ability of the programs to fully address labor market requirements, while 31% considered this alignment partial. These results demonstrate recognized program relevance alongside identified needs for further refinement. Employer collaboration was reported by 54% of instructors, confirming existing industry partnerships while revealing expansion potential. Overall, faculty members perceived the competency-based approach as effectively implemented, though they acknowledged opportunities for enhancement, particularly in adapting curricula to market demands and improving assessment objectivity.

The Kruskal–Wallis test was applied to examine the stability and consistency of evaluations across stakeholder groups, as shown in Table 3. The results indicate that, for most key indicators, mean scores exceeded the predefined success threshold ($M \geq 3.8$), suggesting that the program achieved its primary evaluative objectives. The most stable indicators were observed for overall educational quality, professional competency development, and the applicability of acquired knowledge, as reflected by low CV. The nonparametric Kruskal–Wallis test revealed no statistically significant differences among respondent groups for the majority of key indicators ($p > 0.05$). This finding indicates a high degree of concordance in perceptions of program quality and learning outcomes among master's students, instructors, graduates, and employers.

The closest alignment of evaluations was observed for overall educational quality, the level of competency development, and the applicability of knowledge, indicating congruence between educational outcomes and the expectations of the professional community. Nearly identical ratings provided by graduates and employers on graduates' readiness for independent professional practice further confirm the program's relevance to labor market requirements. At the same time, descriptive differences in mean values persisted for indicators related to the objectivity of assessment and the effectiveness of teaching methods. On average, master's students expressed more critical views than instructors, reflecting differences in educational roles, experiences, and expectations rather than statistically supported between-group effects.

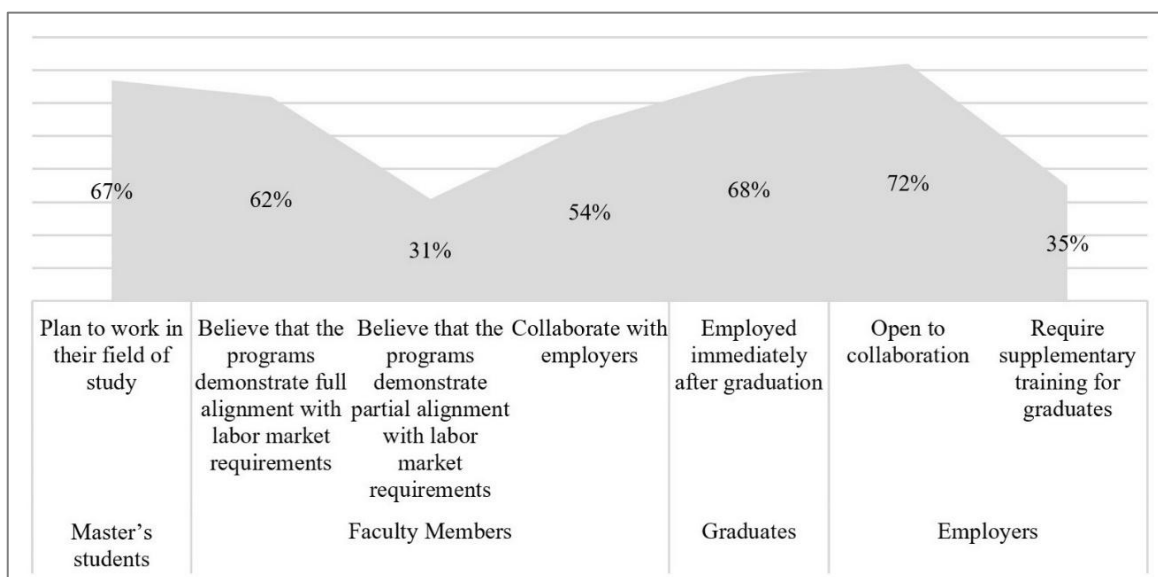


Figure 3. Survey analysis results

The analysis of interviews with representatives from all groups provided deeper insight into the implementation of the competency-based approach within scientific-pedagogical master's programs as shown in Table 4. Master's degree students acknowledged the course's relevance and the value of the research modules, with 53% specifically highlighting progression in their analytical skills and critical thinking. At the same time, 47% noted a lack of integration of theory and practice, as well as uneven development of competencies, which, according to some respondents, largely depended on the specifics of the work of specific teachers.

Table 3. Summary of core survey indicators (Kruskal–Wallis)

Indicator	Master's degree students M(SD)	Faculty member: M(SD)	Graduates M(SD)	Employers M(SD)	H(p)
Overall satisfaction/education quality	4.1(0.85)	4.2(0.68)	4.1(0.81)	4.1(0.74)	H=0.94 (p=0.81)
Competency development/level	4.0(0.92)	4.0(0.82)	3.9(0.94)	3.9(0.83)	H=1.12 (p=0.77)
Effectiveness of teaching methods	4.0(0.89)	4.2(0.67)	—	—	—
Knowledge assessment objectivity/master's degree students	3.8(1.04)	4.0(0.82)	—	—	—
Clarity of learning objectives and outcomes	3.9(0.97)	—	—	—	—
Knowledge applicability/course relevance	4.2(0.78)	4.1(0.73)	4.0(0.83)	4.0(0.79)	H=1.36 (p=0.71)
Communication/presentation skills	—	—	—	3.8(0.92)	—
Readiness for professional/independent work	—	—	3.9(0.87)	3.9(0.85)	H=0.00 (p=1.00)

Table 4. The analysis of interviews with representatives from all groups

Main theme	Subthemes	Master's students	Instructors	Graduates	Employers
Competency development	Analytical and critical thinking	<i>"The program taught me to analyze sources and substantiate my own position."</i>	<i>"We observe growth in students' analytical skills by the end of the program."</i>	<i>"Research skills became the foundation of my professional activity."</i>	<i>"Graduates are able to reason logically and work with information."</i>
	Uneven development of competencies	<i>"Some competencies depend on the particular instructor."</i>	<i>"The level of competency development varies across courses."</i>	<i>"Some skills had to be further developed after graduation."</i>	<i>"Not all graduates are equally prepared for practical tasks."</i>
Integration of theory and practice	Practice-oriented learning	<i>"There is not always sufficient practical training to consolidate theory."</i>	<i>"It is difficult to integrate practical components within a rigid curriculum."</i>	<i>"In practice, the range of requirements was broader than what we had trained for."</i>	<i>"The theoretical foundation is strong, but practical skills are insufficient."</i>
	Linkage to the professional context	<i>"Real-world cases are not used in all courses."</i>	<i>"Engagement with employers is limited."</i>	<i>"The professional context became fully apparent only in the workplace."</i>	<i>"There is a need for more project-based work involving real-world tasks."</i>
Assessment and teaching methods	Objectivity of assessment	<i>"Assessment criteria are not always transparent."</i>	<i>"Assessing abstract competencies remains methodologically challenging."</i>	<i>"Assessment was more theoretical than practice-oriented."</i>	<i>"It is important that assessments reflect actual professional competencies."</i>
	Teaching methods	<i>"Active learning methods are applied inconsistently."</i>	<i>"Active learning methods require more time and resources."</i>	<i>"Project-based assignments were the most useful."</i>	<i>"Project-based learning better prepares graduates for professional practice."</i>
Readiness for professional practice	Practical pedagogical skills	<i>"There is not always enough experience in independent teaching."</i>	<i>"Practical training is constrained by the program's time frame."</i>	<i>"The first year of work was the most challenging."</i>	<i>"Graduates lack confidence in practical professional activities."</i>
	Digital and adaptive skills	<i>"Digital tools were addressed in a fragmented manner."</i>	<i>"Digital preparation requires further strengthening."</i>	<i>"Online formats became a challenge after graduation."</i>	<i>"Adaptability and initiative require further development."</i>

Employers emphasized graduates' strengths: academic culture, analytical thinking, and self-directed learning capacity. However, they also noted "...deficits in practical skills, initiative, and adaptability when solving non-routine problems". Overall, the results of the thematic analysis confirm the findings of the quantitative phase and simultaneously provide a more detailed understanding of the mechanisms behind competency development. All groups agree that graduates possess high levels of academic and analytical skills, but unanimously point to insufficient integration of practical experience, uneven development of

individual competencies, and limited readiness for the demands of professional life. Thus, the qualitative analysis not only confirms the survey findings but also identifies areas for targeted program adjustments: strengthening practice-oriented modules, developing digital and adaptive competencies, and intensifying collaboration with employers.

5. DISCUSSION

The survey and interview results demonstrate positive perceptions of the scientific-pedagogical master's degree programs implemented through the competency-based approach at Al-Farabi Kazakh National University's Faculty of Philosophy and Political Science. The obtained results should be interpreted in light of the institutional and socio-cultural context of the Republic of Kazakhstan, where the processes of modernization of higher education, the implementation of the Bologna principles and the transition to a competence-oriented model, accompanied by structural and resource constraints, continue. In our study, the quantitative stage covered 120 respondents (70 students, 20 teachers, 20 graduates, and 10 employers), while the qualitative stage included 60 interviews (35 students, 10 teachers, 10 graduates, and 5 employers). This distribution ensures analytical triangulation of the data and increases the reliability of the interpretation of the identified trends. High mean scores across most parameters (ranging from 3.8 to 4.2) indicate the recognition of program relevance and quality by all key stakeholder groups: master's degree students, faculty members, graduates, and employers. While the data reflect a certain consistency in program perceptions within the selected institutional sample, they do not represent an "objective consensus" in the strictly statistical sense. The practical significance of this result lies in the program's capacity to provide a foundation for the development of key competencies valued by both students and employers, thereby confirming its relevance to educational and professional practice. These findings may be used by university administrators to further adapt course content and teaching methods.

The results of the nonparametric group analysis (Kruskal-Wallis test) showed no statistically significant differences between the central group assessments, suggesting a relative agreement in the perception of the program's strengths and challenges. The findings are consistent with stakeholder theory [31], which posits that educational outcomes succeed when meeting the expectations of key participants. Notably, employer and graduate ratings converged on competency levels and work readiness, suggesting graduates' accurate self-assessments and appropriate professional preparation. From a practical perspective, the consistency of evaluations across different stakeholder groups confirms that the current program structure can serve as a model for implementing a competency-based approach in other master's programs. A similar approach is also observed in the Ukrainian study [5], where the competency-based approach is considered as a means of harmonizing academic and professional requirements.

High ratings for course relevance (master's degree students: 4.2, faculty members: 4.1) corroborate Steffen and Ohl [1] emphasis on practical orientation and individualized learning trajectories. At the same time, the observed fluctuations in the indicators for goal clarity and stability in competency development point to the need for a more precise and meaningful alignment of learning outcomes, teaching methods, and performance assessment. This remains a methodological challenge for competency-based programs. Their proposed competency framework, designed to foster self-reflection and deliberate professional development, resonates with this study's identified needs for a clearer formulation of learning outcomes (master's degree students: 3.9) and more consistent competency development (CV: up to 24.9%). From a practical perspective, the alignment of evaluations across different stakeholder groups confirms that the current program structure can serve as a model for implementing a competency-based approach in other master's program. While our study focuses on participant perceptions, Steffen and Ohl [1] provide an empirically validated evaluation tool ($\alpha=0.82$), which could inform assessment mechanisms in future academic programs. However, our conclusion also agrees with the findings of Muñiz-Rodríguez *et al.* [12] who emphasized the importance of standardized models of key competencies but pointed out the difficulties of their practical adaptation to specific disciplines.

Regarding the effectiveness of teaching methods, the evaluations of master's degree students (4.0) and faculty members (4.2) corroborate a recent meta-analysis [20] demonstrating the significant impact of methodological support and modular program design on professional skill development (effect size $g=0.46$). The practical significance of this result lies in the fact that the implementation of effective teaching methods directly influences competency development and can be used to refine pedagogical strategies and practical training modules. However, the descriptive differences in the perception of teaching method effectiveness between students and instructors indicate a discrepancy between expectations and learning experiences and confirm research findings on the difficulty of implementing active and practice-oriented methods in resource-constrained contexts with high teaching loads. This contrasts with the focus of Zhang *et al.* [20] on systematic student support through seminars and learning courses. Similar contradictions are also noted in the

literature on the Canadian experience [4], which emphasizes the gap between the goals of teacher education and the actual readiness of graduates for professional activity.

The identified areas of divergence, particularly regarding assessment objectivity and teaching effectiveness, reveal differing perceptions of the educational process. Master's degree students exhibited a more critical view of evaluation fairness, while faculty members rated it more favorably. Similarly, instructors positively assessed their teaching methods, whereas students noted certain deficiencies in effectiveness, indicating a need for greater learner engagement and adaptive pedagogical techniques. These findings align with Biggs' constructive alignment framework, which posits that the success of educational programs depends on coherence among learning objectives, instructional methods, and assessment mechanisms [32]. From the perspective of competency-based pedagogy, this points to a systemic problem in the measurement of abstract and meta-competencies, particularly in the humanities and in education programs.

This study reveals that employers assign relatively low ratings to graduates' communication and presentation skills (3.8), with substantial variability ($CV=24.2\%$). These results support the conceptualization of communicative awareness as an integrative skill encompassing socio-psychological components and role adaptability [10]. The practical significance of these findings lies in the need to implement targeted training in communication, presentation skills, and applied projects, as well as to strengthen collaboration with employers in order to better prepare graduates for real professional environments. The limited faculty-reported collaboration with employers (54%), combined with 44% of employers indicating the need for graduate retraining, demonstrates partial misalignment between academic and professional discourses. These findings underscore the necessity for enhancing practice-oriented modules specifically targeting these skill deficiencies. Similar conclusions are presented in a scientific article [26], which emphasizes the need to harmonize local programs with European standards without ignoring the sociocultural context.

Regarding assessment objectivity, the study identified a discrepancy between evaluations (master's degree students=3.8 and faculty members=4.0). This finding corresponds with the conclusions of Lawrence *et al.* [11], who documented faculty challenges in assessing abstract competencies and resource constraints for active learning methodologies. At the same time, our results echo studies on the digitization of education [13], [14], which emphasize that new tools and hybrid learning models can reduce the subjectivity of assessment and increase the transparency of the educational process. Practical implications of these findings include recommendations for expanding internships, conducting joint modules with employers, and implementing authentic forms of assessment that reflect real-world professional tasks.

Thus, our results generally confirm the effective implementation of competency-based education within master's degree programs. Nevertheless, the findings also highlight critical areas for improvement. In particular, it is necessary to strengthen practical training components, refine assessment mechanisms, clarify learning objectives, and foster university-industry collaboration. These areas for improvement coincide with the recommendations of international researchers [4], [21], [22], who emphasize the development of critical thinking, independence, and the alignment of educational practices with global challenges.

6. CONCLUSION

This study evaluated the implementation of the competency-based approach in scientific-pedagogical master's degree programs at Al-Farabi Kazakh National University through surveys and interviews with key stakeholders: master's degree students, faculty members, graduates, and employers. The survey results indicate generally high satisfaction with program content, course relevance, and the quality of education, with mean scores for most indicators ranging from 3.8 to 4.2. The relevance of the disciplines and teaching effectiveness received particularly positive evaluations. However, several areas for improvement were identified, including limitations in assessment objectivity and insufficient practical orientation of certain program components. Interview data complemented quantitative findings by revealing theory-practice discrepancies, uneven development of pedagogical and project competencies, and graduates' lack of practical skills. The results obtained allow for a deeper understanding of the strengths and limitations of existing programs, as well as to specify those aspects that most need improvement. Methodological limitations of the study include targeted sampling, unequal group distribution, the use of self-reports, and the study location, which restricts the generalizability of the results beyond the study context.

Future research directions include examining the impact of various teaching and assessment methods on competency development, which may help identify the most effective approaches. It is also important to investigate how educational programs influence graduates' career trajectories in order to adjust instructional content and formats to labor market demands. More effective competency assessment models should be developed to objectively measure the level and depth of acquired skills. Additionally, comparing educational programs across different universities may provide insight into best practices and contribute to the harmonization of quality standards in higher education.

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AUTHOR CONTRIBUTIONS STATEMENT

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

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C : Conceptualization

M : Methodology

So : Software

Va : Validation

Fo : Formal analysis

I : Investigation

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O : Writing - Original Draft

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Vi : Visualization

Su : Supervision

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Fu : Funding acquisition

CONFLICT OF INTEREST STATEMENT

Authors state no conflict of interest.

INFORMED CONSENT

Written informed consent was obtained from all participants.

ETHICAL APPROVAL

The study was conducted in accordance with the rules of the Declaration of Helsinki. The study was approved by Al-Farabi Kazakh National University.

DATA AVAILABILITY

All data generated or analyzed during this study are included in this published article.

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APPENDIX

APPENDIX A

Questionnaire for master's degree students

1. Your age:
☐ Under 23 ☐ 24–26 ☐ Over 26
2. Your gender: _____
3. Year of study: _____

4. Are you satisfied with the content of the educational program?
☐ 1—Not at all ☐ 2 ☐ 3 ☐ 4 ☐ 5—Completely
5. To what extent do the courses contribute to the development of professional competencies?
☐ 1—Not at all ☐ 2 ☐ 3 ☐ 4 ☐ 5—Significantly
6. Please rate the relevance of the courses to your future profession:
☐ 1—Irrelevant ☐ 2 ☐ 3 ☐ 4 ☐ 5—Highly relevant
7. How clearly are the learning objectives and outcomes formulated?
☐ 1—Unclear ☐ 2 ☐ 3 ☐ 4 ☐ 5—Very clear
8. Please rate the effectiveness of the teaching methods employed by your teachers:
☐ 1—Ineffective ☐ 2 ☐ 3 ☐ 4 ☐ 5—Highly effective
9. Please rate the fairness of knowledge assessment methods used in your program:
☐ 1—Unfair ☐ 2 ☐ 3 ☐ 4 ☐ 5—Completely fair
10. Do you plan to work in your field of study after completing your master's degree?
☐ Yes ☐ No
11. How well does the program content meet your expectations?
☐ 1—Not at all ☐ 2 ☐ 3 ☐ 4 ☐ 5—Fully meets
12. Does your university offer an opportunity to choose elective courses based on your interests?
☐ Yes ☐ Partially ☐ No
13. Are there enough practice-oriented activities in the program?
☐ 1—Not enough ☐ 2 ☐ 3 ☐ 4 ☐ 5—More than enough
14. How satisfied are you with the accessibility of instructors for consultations?
☐ 1—Not satisfied ☐ 2 ☐ 3 ☐ 4 ☐ 5—Fully satisfied
15. To what extent does the learning process foster critical and analytical thinking?
☐ 1—Does not foster ☐ 2 ☐ 3 ☐ 4 ☐ 5—Strongly fosters

Questionnaire for faculty members

1. Years of university teaching experience:
☐ Less than 5 years ☐ 5–10 years ☐ More than 10 years
2. Do you participate in the development of educational program?
☐ Yes ☐ No
3. Please rate the program alignment with the competency-based approach:
☐ 1—Not aligned ☐ 2 ☐ 3 ☐ 4 ☐ 5—Fully aligned
4. Do courses effectively develop pedagogical and research competencies in master's degree students?
☐ 1—Not at all ☐ 2 ☐ 3 ☐ 4 ☐ 5—Very effectively
5. Please select the teaching methods you use most frequently:
☐ Lectures ☐ Practical sessions ☐ Group work ☐ Projects ☐ Mixed methods
6. Please rate the effectiveness of your teaching methods:
☐ 1—Ineffective ☐ 2 ☐ 3 ☐ 4 ☐ 5—Highly effective
7. Please rate the fairness of your assessment methods:
☐ 1—Unfair ☐ 2 ☐ 3 ☐ 4 ☐ 5—Completely fair
8. Does the program meet labor market requirements?
☐ Yes ☐ Partially ☐ No
9. Is there collaboration with employers?
☐ Yes ☐ No
10. Please rate the overall quality of the program:
☐ 1—Very poor ☐ 2 ☐ 3 ☐ 4 ☐ 5—Excellent
11. Please rate your satisfaction with available resources (classrooms, equipment, database access):
☐ 1—Very dissatisfied ☐ 2 ☐ 3 ☐ 4 ☐ 5—Completely satisfied
12. Are professional development opportunities available for you?
☐ Yes ☐ Partially ☐ No
13. Please rate the complexity of integrating research findings into teaching.
☐ 1—Impossible ☐ 2 ☐ 3 ☐ 4 ☐ 5—Very easy
14. How would you assess the learning motivation of master's degree students?
☐ 1—Very low ☐ 2 ☐ 3 ☐ 4 ☐ 5—Very high
15. Does the program adapt flexibly to changes in the professional field?
☐ Yes ☐ Partially ☐ No

Questionnaire for graduates

1. Year of master's degree completion: _____
2. Current employment status: _____
3. Please rate the practical applicability of the acquired knowledge:
☐ 1—Not applicable ☐ 2 ☐ 3 ☐ 4 ☐ 5—Fully applicable
4. Please rate your work readiness after graduation:
☐ 1—Not prepared ☐ 2 ☐ 3 ☐ 4 ☐ 5—Fully prepared
5. Please rate the alignment of your curriculum with professional requirements:
☐ 1—Not aligned ☐ 2 ☐ 3 ☐ 4 ☐ 5—Fully aligned
6. Please rate your level of developed competencies:
☐ 1—Very low ☐ 2 ☐ 3 ☐ 4 ☐ 5—Very high
7. In your opinion, which learning methods were the most beneficial:
☐ Lectures ☐ Practical training ☐ Research ☐ Self-study ☐ Project work
8. Did the program help you adapt to the labor market?
☐ Yes ☐ Partially ☐ No
9. Were you employed immediately after graduation?
☐ Yes ☐ No
10. Please rate your satisfaction with the quality of education:
☐ 1—Very dissatisfied ☐ 2 ☐ 3 ☐ 4 ☐ 5—Completely satisfied
11. Are you working in your field of study?
☐ Yes ☐ Partially ☐ No
12. Did you participate in internships/practicum during studies?
☐ Yes ☐ No
13. How would you rate the level of support your university provides for graduate employment?
☐ 1—No support ☐ 2 ☐ 3 ☐ 4 ☐ 5—Full support
14. Which skills should be strengthened in the master's degree program?
☐ Research ☐ Management ☐ Communication ☐ Technical/Digital
15. Do you plan to pursue further education (PhD, professional development courses, etc.)?
☐ Yes ☐ No ☐ Possibly

Questionnaire for employers

1. Please specify your organization type:
☐ State ☐ Private ☐ R&D/International ☐ Other
2. How many graduates of Al-Farabi Kazakh National University have you hired in the past five years?
☐ 0 ☐ 1–2 ☐ 3–5 ☐ More than 5
3. Are you satisfied with their training?
☐ 1—Not satisfied ☐ 2 ☐ 3 ☐ 4 ☐ 5—Completely satisfied
4. How would you rate their level of professional competencies?
☐ 1—Very low ☐ 2 ☐ 3 ☐ 4 ☐ 5—Very high
5. How would you rate their communication and presentation skills?
☐ 1—Very weak ☐ 2 ☐ 3 ☐ 4 ☐ 5—Excellent
6. How would you rate their readiness for independent work?
☐ 1—Not prepared ☐ 2 ☐ 3 ☐ 4 ☐ 5—Fully prepared
7. Is additional training required after hiring?
☐ Yes ☐ No ☐ Partially
8. Rate the extent to which the graduates demonstrate teamwork skills:
☐ 1—Very Poor ☐ 2 ☐ 3 ☐ 4 ☐ 5—Excellent
9. Are you willing to cooperate with the faculty (e.g., internships, training placements, etc.)?
☐ Yes ☐ No ☐ Possibly
10. How would you rate the overall preparation of Al-Farabi Kazakh National University graduates:
☐ 1—Very low ☐ 2 ☐ 3 ☐ 4 ☐ 5—Excellent
11. Which form of collaboration with the university do you consider most effective?
☐ Internship ☐ Joint projects ☐ Teaching ☐ Expert consultation
12. To what extent do the graduates possess digital skills and ICT competencies?
☐ 1—Not at all ☐ 2 ☐ 3 ☐ 4 ☐ 5—At a high level
13. Which graduate competencies are most important to you?
☐ Analytical ☐ Communication ☐ Leadership ☐ Ethical ☐ Professional and technical

14. How would you assess the graduates' adaptability to your organization's corporate culture?
☐ 1—Do not adapt ☐ 2 ☐ 3 ☐ 4 ☐ 5—Adapt quickly
15. Are you willing to participate in the development of educational programs?
☐ Yes ☐ No ☐ Possibly

APPENDIX B

Interview questions for master's degree students:

1. What aspects of your educational program do you find most and least appealing?
2. Which courses have been most valuable for you? Why?
3. How would you assess the connection between theoretical knowledge and its practical application?
4. To what extent do you feel prepared for your future professional career?
5. What changes would you suggest to improve the learning process?

Interview questions for faculty members:

1. How do you implement the competency-based approach in the master's degree programs?
2. What challenges do you face in developing or delivering the curriculum?
3. How do you assess whether master's degree students have acquired the required competencies?
4. To what extent are you able to incorporate active learning methods?
5. Which forms of collaboration with employers do you find most effective?

Interview questions for graduates:

1. Which knowledge and skills from your master's degree program do you actively use in your work?
2. In your opinion, what aspects of the program were insufficient or underdeveloped?
3. How well did your education prepare you for current professional demands?
4. What challenges did you encounter after graduation?
5. What recommendations would you offer to future master's degree students?

Interview questions for employers:

1. What key competencies do you expect from graduates?
2. How well do graduates meet your expectations in terms of preparedness?
3. What strengths and weaknesses do you observe in early-career professionals?
4. Do you currently collaborate with the university? If so, in what ways?
5. Would you be willing to engage in internships or joint projects with the university?

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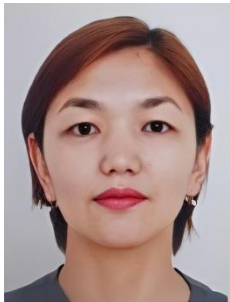
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