



## STIMULATING THE SCIENTIFIC AND EDUCATIONAL ACTIVITIES OF UKRAINIAN HIGHER EDUCATION TEACHERS FOR SUSTAINABLE DEVELOPMENT AND INNOVATION

ESTIMULACIÓN DE LAS ACTIVIDADES CIENTÍFICAS Y EDUCATIVAS DE LOS DOCENTES UNIVERSITARIOS DE UCRANIA PARA UN DESARROLLO SOSTENIBLE E INNOVACIÓN

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### ABSTRACT

In the article, the prerequisites for the study of the problem of stimulating the scientific and educational activity of a higher school teacher are identified and justified, and the factors that stimulate his activity are determined. Effectiveness monitoring has been developed as the basis of the mechanism for stimulating the scientific and educational activity of a higher school teacher. Pedagogical conditions for stimulating the scientific and educational activity of a higher school teacher are defined and substantiated. An experimental trial of monitoring the effectiveness and pedagogical conditions of stimulating the teacher's scientific and educational activities was carried out and its results were evaluated. The epistemological reasons for the need to evaluate the results of higher education teachers' scientific and educational activities from the standpoint of their effectiveness have been identified and characterized. The provisions on the necessity and feasibility of applying pedagogical conditions in the practice of stimulating higher education teachers' scientific and educational activities aimed at their professional

and personal development have been substantiated. The presented contradictions, prerequisites, and principles for developing a mechanism and constructing pedagogical conditions for stimulating higher education teachers' scientific and educational activities develop ideas about the possibility of their use in the process of professional development of research and teaching staff.

### Keywords:

Educational Activity, Scientific, Higher School, Pedagogical Conditions

### RESUMEN

En el artículo se identifican y justifican los antecedentes para el estudio del problema de la estimulación de la actividad científica y educativa de los docentes de educación superior, así como los factores que influyen en su motivación y desempeño. Se desarrolla el monitoreo de la efectividad como base del mecanismo para estimular la actividad científica y educativa de los docentes



universitarios. Asimismo, se definen y fundamentan las condiciones pedagógicas necesarias para dicho estímulo. Se llevó a cabo un ensayo experimental para evaluar el monitoreo de la efectividad y la aplicación de estas condiciones pedagógicas, cuyos resultados fueron analizados. Se caracterizan las razones epistemológicas para evaluar la actividad científica y educativa desde el enfoque de su efectividad y se justifican la necesidad y viabilidad de aplicar condiciones pedagógicas que promuevan el desarrollo profesional y personal de los docentes. Finalmente, se presentan las contradicciones, antecedentes y principios para diseñar un mecanismo y construir condiciones pedagógicas que estimulen la actividad científica y educativa, mostrando su aplicabilidad en el proceso de desarrollo profesional del personal docente e investigador.

#### Palabras clave:

Actividad Educativa, Científica, Educación Superior, Condiciones Pedagógicas

Gamificación, educación superior, aprendizaje experiencial, competencia digital, participación estudiantil, educación interdisciplinaria.

#### INTRODUCTION

Higher education represents a constantly evolving and revolutionary system within the state structure, continually shaped by government policies and the pace of economic development. These transformations at the institutional level inevitably impact the role and responsibilities of university teachers, presenting both the management of universities and the faculty themselves with the challenge of continuous professional improvement. In this context, the role of the teacher becomes increasingly central, as effective self-management and institutional management of professional development, including the creation of mechanisms and conditions that stimulate teaching and research activity, directly contribute to the enhancement of professional skills and the effectiveness of academic work. The formation of an effective teaching staff is crucial for the success of a university, since the institution's reputation and overall performance largely reflect the collective activities of its scientific and pedagogical team (Brew, 2006).

Pedagogical theory and educational practice consistently prioritize the continuous professional growth of higher education teachers. Therefore, the implementation of mechanisms and procedures that stimulate the scientific and educational activity of faculty and increase their effectiveness constitutes a key resource for professional development, the advancement of higher education, and a driver of economic and social transformation within society. Empirical and theoretical studies further reinforce this

perspective, identifying that the professional motivation and performance of university faculty can be significantly enhanced through structured incentive systems, performance monitoring, and participation in research and pedagogical networks (Kwiek & Roszka, 2025).

A detailed review of the literature shows that the theoretical landscape of higher education effectiveness includes a variety of works analyzing the performance of educational systems at multiple levels. Research by (Kablova et al., 2021; Kuzmenko et al., 2025) emphasizes the importance of systematically managing the higher education system as a complex social entity. Their studies highlight that high-quality information, both in quantity and relevance, forms the basis for forecasting system development, evaluating institutional balance, and identifying areas in need of improvement. Based on these insights, the authors advocate for the application of structured procedures such as control and stimulation in higher education management to enhance institutional and faculty performance (Malakhov et al., 2024).

Furthermore, the findings by Kwiek & Roszka (2025) reveal that incentives, professional recognition, and participation in academic networks are crucial factors influencing scientific productivity across different stages of an academic career. These results underscore that the stimulation of scientific and educational activity requires not only individual faculty commitment but also an institutional framework that incorporates evaluation mechanisms, professional development opportunities, and incentives aimed at fostering sustained, high-quality research. Collectively, these studies suggest that the design of effective stimulation mechanisms, aligned with broader institutional and societal goals, is essential for promoting innovation, enhancing faculty performance, and ensuring the sustainable development of higher education systems.

Ultimately, the integration of pedagogical theory, empirical research, and institutional strategy indicates that stimulating the scientific and educational activity of university teachers is a multidimensional process. It requires the alignment of personal motivation, institutional policies, technological tools, and international best practices to build a professional environment that supports continuous development, enhances academic productivity, and contributes to the broader social and economic progress of society.

According to the authors Shulha et al. (2022) present the latest pedagogical approaches focused on developing creative abilities in preschool education, highlighting the importance of active, student-centered methodologies that promote exploration, curiosity, and innovation from the early stages of learning. These strategies demonstrate that fostering creativity and autonomy is a key component

which, when applied to higher education, can enhance pedagogical innovation and empower teachers to implement more dynamic and contextually adaptive educational practices.

The authors Altbach et al. (2009) analyze global trends in higher education, emphasizing a transformative process characterized by internationalization, increased competitiveness, and the integration of research and teaching. Their study underscores that universities must adapt to structural, technological, and social changes to maintain academic relevance and excellence. This perspective provides a conceptual framework for stimulating the scientific and educational activities of faculty, suggesting that institutional innovation and professional development are essential to meet global challenges.

According to the authors Deci and Ryan (2000) contribute the self-determination theory, highlighting that intrinsic motivation and the satisfaction of basic psychological needs—autonomy, competence, and relatedness—are fundamental for active engagement in any activity, including university teaching and research. Their framework reinforces the idea that strategies to stimulate faculty should consider not only external incentives but also the creation of environments that foster internal motivation, self-efficacy, and professional fulfillment.

It is detailed how the authors Kuchynska et al. (2022) examine innovative educational activities in Ukrainian higher education amid modern reforms, emphasizing the need to integrate innovative pedagogical methods, information technologies, and collaborative approaches to improve educational quality and promote applied research. Their findings show that educational innovation and modernization of institutional processes are key factors for stimulating scientific and teaching activity, creating conditions that enhance sustainability, competitiveness, and the holistic development of university faculty.

Finally, Ferguson (2025) explores the beliefs of Norwegian higher education teachers regarding teaching, motivation, and approaches to researching and developing their teaching practice. The study shows that intrinsic motivation and perceptions of professional efficacy are key factors in actively engaging in educational research and pedagogical innovation. This underscores the importance of designing stimulation strategies that consider both motivational factors and institutional resources to support research and teaching in higher education.

Stimulating the scientific and educational activities of university teachers requires comprehensive strategies that combine technological innovation, institutional incentives, and continuous professional development. The incorporation of digital platforms and distance learning tools allows for expanded access to education, improved pedagogical

and technological competencies of teachers, and enhanced effectiveness of their research activities. Likewise, integrating research and teaching within universities increases academic and social impact, while the application of modern technologies optimizes productivity and efficiency in educational and research processes.

Additionally, designing appropriate organizational and pedagogical conditions is essential to maintain motivation, continuous professional growth, and active engagement of faculty. Incentives, professional recognition, and individual perceptions of efficacy significantly contribute to research productivity and pedagogical innovation. Together, these elements create a university environment that fosters sustainability, innovation, and competitiveness, strengthening the quality and comprehensive development of higher education.

A second critical generalization emerging from the analysis concerns the precise conceptualization of key terms central to enhancing the scientific and educational activities of university faculty, including “stimulation”, “monitoring”, “effectiveness of activity” and “effective contract”. Stimulation can be understood as a deliberate function aimed at activating the professional activity of individual teachers and entire pedagogical teams, thereby ensuring measurable improvements in the effectiveness and quality of their work. It encompasses the design and implementation of strategies that motivate, guide, and facilitate faculty engagement in research, teaching, and other educational responsibilities. Monitoring, on the other hand, represents a structured, managed, and guided flow of information regarding the current state of the university system and its educational processes, allowing administrators and faculty to make informed decisions, optimize resource allocation, and forecast the system’s development in a strategic and adaptive manner. The effectiveness of activities, particularly of faculty members, is evaluated through systematic comparison of actual outcomes with planned objectives, providing a framework for continuous improvement and accountability.

The concept of an effective contract complements these mechanisms by serving as an additional agreement to the standard employment contract, explicitly designed to incentivize higher performance. Such a contract establishes enhanced obligations and responsibilities for faculty, linked directly to the outcomes of their scientific-methodological work, research productivity, and educational contributions. This structured approach aligns institutional objectives with individual performance, creating a mutually reinforcing system of motivation, accountability, and professional growth.

Through analytical exploration, several fundamental contradictions have been identified within the higher

education system. First, there is the persistent need to significantly enhance the efficiency and impact of domestic higher education organizations, juxtaposed with the underdevelopment of theoretical and methodological foundations necessary for managing this process effectively. Second, while the scientific and educational activity of university faculty is increasingly recognized as an object requiring stimulation, there remains a lack of sufficiently developed mechanisms and procedures to operationalize this function.

Third, there is a critical need to model and organize stimulating conditions and monitoring procedures aimed at increasing faculty effectiveness, yet scientific methodologies and frameworks for implementing such systems are largely absent. Finally, the scientific-methodological and psychological-pedagogical support essential for these organizational and evaluation procedures is insufficiently developed, limiting the capacity to foster sustained professional development and high-quality educational outcomes.

Collectively, these insights underscore the importance of constructing integrated systems that combine stimulation, monitoring, and contractual incentives within universities. Developing robust frameworks for these mechanisms not only enhances the professional activity and motivation of faculty but also strengthens the overall effectiveness, innovation, and competitiveness of higher education institutions. Such an approach establishes a foundation for continuous improvement, aligning individual and institutional objectives while fostering an environment conducive to sustainable academic growth and excellence.

## MATERIALS AND METHODS

The research problem is formulated as follows: what are the theoretical foundations and practical approaches to solving the problem of increasing the effectiveness of the scientific and educational activity of a higher school teacher by using pedagogical conditions to stimulate it?

The object of research is the scientific and educational activity of a teacher of a higher school.

The subject of the research is the pedagogical conditions for stimulating the scientific and educational activities of the higher school teacher.

The purpose of the study is to theoretically substantiate and experimentally test the pedagogical conditions for stimulating the scientific and educational activity of a higher school teacher.

The hypothesis of the research was the assumption that the effectiveness of the scientific and educational activity

of the teacher of the higher school will be noticeably higher if:

- the prerequisites for the study of the problem of stimulating the scientific and educational activity of a higher school teacher will be identified and substantiated, the factors that stimulate his activity will be determined;
- monitoring of effectiveness will be used as the basis of the mechanism of stimulating the scientific and educational activity of the higher school teacher;
- the pedagogical conditions for stimulating scientific and educational activities of the higher school teacher will be determined and substantiated;
- the model and pedagogical conditions for stimulating the scientific and educational activity of a higher school teacher will be introduced into the university's work practice.

Appropriate research methods were used at all stages of the work. The first stage included an analysis of regulatory documents on the organization of assessment procedures at the university, pedagogical modeling, and analysis and synthesis of data available in the literature and practical experience. The second stage included methods such as questionnaires and interviews, observation, analysis of the products of the scientific and educational activities of teachers, and experimental methods (ascertaining, formative, and control experiments).

The empirical basis of the study consisted of:

- a model and pedagogical conditions for motivating faculty members, as well as relevant scientific and methodological materials, being implemented in the educational process;
- data from a theoretical analysis of the types of monitoring and incentives currently used in higher education to assess the effectiveness of university faculty;
- the results of a pilot study conducted at a technological university, involving approximately 200 faculty members. Faculty members in the control group planned and evaluated their work based on individual plans, while those in the experimental group were subject to the proposed model and incentive conditions.

## RESULTS AND DISCUSSIONS

Hedzyk et al. (2023) analyze the prospects for the development of distance education in Ukraine, highlighting the importance of methodological approaches and digital platforms to ensure the continuity and quality of university education. Their study shows that the implementation of remote learning tools not only expands access to education but can also serve as a motivating factor for teachers by enabling them to develop advanced technological and pedagogical skills. These findings are particularly relevant

for stimulating the scientific and educational activities of Ukrainian faculty, as they provide new avenues for applied research and pedagogical innovation.

The work compiled by León-González & Pire-Rojas (2025) provides an integrative perspective on how research, neuroscience, and artificial intelligence can enhance university education. Their analyses highlight that understanding the cognitive and motivational processes of both students and teachers allows for the design of more effective pedagogical strategies, which is essential for stimulating the scientific and educational activities of faculty. Additionally, the work emphasizes the importance of technological innovation as a central component of continuous professional development, which can be applied to contexts such as Ukrainian higher education institutions, where the integration of artificial intelligence tools and evidence-based methodologies can increase the effectiveness and sustainability of teaching and research activities.

On the other hand, Soria-León (2025) focuses on educational management in higher education, emphasizing the need to implement clear pedagogical conditions, evaluation mechanisms, and incentive systems that promote scientific and teaching activity. The author underlines that the alignment between institutional management and teacher professional development is key to improving academic productivity, educational innovation, and institutional competitiveness. This framework is applicable to the Ukrainian context, where stimulating research and teaching requires both individual teacher commitment and the design of institutional policies and strategies that facilitate professional growth, increase motivation, and foster educational innovation.

The authors Mohrman et al. (2008) examine the transformation of the research university into an emerging global model, emphasizing the need for universities to integrate research and teaching within a strategic framework that promotes academic excellence. Their analysis highlights that faculty who actively engage in research and educational development tend to generate greater scientific and social impact, reinforcing the idea that stimulating scientific and educational activities requires both clear institutional policies and incentives that encourage the integration of research and teaching.

The authors Malakhov et al. (2024) demonstrate how modern information technologies can optimize scientific research and educational activities. They point out that the use of advanced digital tools, data analysis systems, and collaborative platforms enhances faculty productivity and increases efficiency in managing educational and research projects. This technological approach provides a useful framework for implementing strategies that foster innovation and continuous professional development

among university teachers, key aspects for institutional sustainability and competitiveness.

According to the authors Nebelenchuk et al. (2024) highlight the organizational and pedagogical conditions necessary for the continuous professional development of faculty in postgraduate education contexts. Their research emphasizes that strategic planning, performance monitoring, and the provision of pedagogical incentives are determining factors in increasing motivation, effectiveness, and the quality of teaching and research activities. These results provide evidence that stimulating scientific and educational activity requires not only individual commitment but also an institutional environment that facilitates learning and ongoing professional growth.

The study by Wang et al. (2024) highlights the internationalization of teaching as a fundamental driver for the professional development of higher education faculty. Academic mobility, engagement in international training programs, and the systematic exchange of best practices enable educators to broaden their pedagogical competencies, integrate innovative approaches into their teaching, and enhance educational quality in their home institutions. Beyond technical and methodological improvements, internationalization also cultivates interdisciplinary collaboration, cross-cultural understanding, and a competitive global perspective, which are essential for the holistic development of faculty and for fostering sustainable, innovative educational ecosystems. By engaging with global academic communities, faculty not only enrich their knowledge base but also gain exposure to cutting-edge research, novel instructional strategies, and diverse models of curriculum design, all of which contribute to increasing institutional prestige, research impact, and teaching excellence.

Building on these insights, several prerequisites emerge for effectively stimulating faculty research and educational activity through incentive and monitoring mechanisms. First, scientific evidence regarding assessment philosophies and methodologies, alongside empirically grounded incentive models, provides a critical foundation for structuring faculty development policies. Second, the continuous evolution of society, culture, and higher education systems necessitates adaptation in university structures, objectives, and faculty roles. The growing participation of universities as active agents in the market of research, education, and cultural services positions higher education institutions not only as centers of knowledge but also as key economic and innovation actors. This shift introduces new challenges, including the need to define and measure faculty effectiveness, ensure equitable access to professional development opportunities, and

align teaching and research outcomes with strategic institutional priorities.

Despite these opportunities, significant challenges remain. Low effectiveness in faculty research and teaching often arises due to inadequate preparation for contemporary academic demands, such as performance under contract-based employment or engagement with complex digital and collaborative tools. Inappropriate reliance on scientometric data, bureaucratic management structures, and poorly designed incentive systems further impede the ability to stimulate high-impact research and teaching. Globalization, internationalization, integration, regionalization, and ethno-cultural dynamics exert additional pressures, requiring faculty to navigate complex educational, social, and economic environments. In this context, effective incentives and systematic monitoring are indispensable management tools, serving not only to improve the quality of higher education and scientific output but also to support continuous faculty development, promote intrinsic motivation, and ensure alignment between individual performance and institutional goals (Mohrman & Baker, 2008).

Furthermore, the integration of internationalization with institutional incentive systems creates synergistic effects for faculty development. Exposure to global practices encourages faculty to adopt innovative pedagogical and research methods, while structured institutional frameworks—comprising clear evaluation criteria, performance monitoring, and professional incentives—ensure that these innovations translate into measurable improvements in teaching and research productivity. Advanced technologies, digital platforms, and collaborative tools enhance these processes by providing faculty with real-time feedback, data-driven insights, and opportunities for interdisciplinary cooperation, thereby reinforcing a culture of continuous improvement, innovation, and professional excellence. Ultimately, fostering faculty scientific and educational activity requires a multidimensional strategy that combines global engagement, institutional support, continuous assessment, and technological integration to ensure the sustainable development of both educators and higher education systems.

This comprehensive approach underscores that stimulating scientific and educational activity is not a matter of isolated initiatives but a systemic process. It requires harmonizing international exposure, pedagogical innovation, institutional incentives, and continuous monitoring to build resilient and competitive universities capable of producing high-quality research, transformative teaching, and socially impactful knowledge. By embracing these interconnected strategies, higher education institutions can cultivate faculty who are motivated, well-prepared, and

equipped to navigate the challenges of modern academia while contributing to sustainable development, innovation, and global competitiveness.

The study demonstrates that the effectiveness of a university and its individual faculty cannot be objectively assessed without considering the quality of the educational process and the quality of specialist training at the university. Therefore, incentives should become an effective mechanism for managing not only the effectiveness and quality of higher education, but also a means of managing and self-regulating the professional development of faculty.

The study identified factors that determine the effectiveness of higher education faculty in their research and educational activities. These factors include, for example, low faculty readiness and ability to perform effectively, the diversification of the university's mission and model, as well as the faculty model and content of their work, dynamic processes in the labor market and educational services, higher education standardization processes, changing requirements for research results, changing approaches to performance evaluation, including financial ones, and others. These factors not only influence the effectiveness of faculty in their research and educational activities but also serve as the basis for developing performance evaluation criteria.

The study identified principles whose adherence determines the level of performance (Deci & Ryan, 2000). These included: the presence of clearly expressed ideals or mission; common sense; Appointment or election of an expert council; compliance with regulations or discipline; honest business conduct; development of simple and clear key performance indicators, maintaining direct, adequate, and ongoing records of achievements; clear time and cost scheduling, or so-called dispatching; introduction of standards and schedules—a predetermined set of rules or regulations generally recognized in the professional activities of university employees; determination of standard conditions and standardization of operations; development of regulatory, methodological, and practical instructions; a system of rewards for effective work.

The obtained understanding of the prerequisites, factors, and principles made it possible to create and substantiate a monitoring mechanism and pedagogical conditions, develop criteria and their indicators for performance assessment, and organize work on training teachers with the aim of increasing the effectiveness of their research and educational activities (Etzkowitz & Leydesdorff, 2000).

During the experimental work, pedagogical conditions for stimulating the scientific and educational activities of

higher education teachers were substantiated and proposed. These conditions included organizational, psychological, pedagogical, and technological factors.

Organizational factors are specialized, scientifically based tools for university management that, using algorithms as a step-by-step design language, enable the general conceptual design of incentives to be translated into individualized projects for enhancing teacher effectiveness.

Psychological and pedagogical factors, on the one hand, represented the psychological microclimate created through the introduction and use of incentive procedures. On the other hand, they constitute a set of psychological and pedagogical actions related to the development and implementation of individualized training programs for teachers.

Technological conditions are presented as activities aimed at organizing and modifying other activities. These activities determine the focus, content, and roles of the subjects of incentive and evaluation procedures at the university, leading to significant modernization of the scientific and educational activities of teachers.

Monitoring the effectiveness of the scientific and educational activities of higher education teachers is presented in Table 1.

Table 1: Monitoring the effectiveness of scientific and educational activities of a higher education teacher.

BLOCKS	CONTENT
<b>TARGET BLOCK: Purpose and Objectives of Monitoring the Effectiveness of the Teacher's Professional Activity</b>	<p><b>Purpose of monitoring:</b> Forming the system 'Effective University'.</p> <p><b>Objectives of monitoring:</b></p> <ul style="list-style-type: none"> <li>- Improving the quality of scientific and pedagogical staff</li> <li>- Improving the quality of specialist training</li> <li>- Improving the quality of management decisions</li> </ul>
<b>METHODOLOGICAL BLOCK: Principles of Monitoring</b>	Openness, objectivity, continuity, cyclicity, relevance, scientific validity, diagnostic and prognostic orientation, sufficient completeness.
<b>BLOCK: MONITORING FOCUS AND PARTICIPANTS</b>	<p><b>Objects of monitoring:</b></p> <ul style="list-style-type: none"> <li>- Educational and methodological activity</li> <li>- Scientific activity</li> <li>- Educational activity</li> <li>- Enlightenment activity</li> <li>- Entrepreneurial activity</li> </ul> <p><b>Subjects of monitoring:</b></p> <ul style="list-style-type: none"> <li>- Monitoring service specialists</li> <li>- Representatives of employers</li> <li>- Graduates</li> <li>- Students</li> <li>- Teachers</li> </ul>
<b>DIAGNOSTIC BLOCK: Monitoring Procedures</b>	<p><b>Procedures: measurement, evaluation, comparison, analysis, rating.</b></p> <p>Criteria and Indicators:</p> <ul style="list-style-type: none"> <li>- Academic-methodological: quantitative, qualitative, relative</li> <li>- Scientific-research: quantitative, qualitative, relative</li> <li>- Educational: quantitative, qualitative, relative</li> <li>- Enlightenment: quantitative, qualitative, relative</li> <li>- Entrepreneurial: quantitative, qualitative, relative</li> </ul>
<b>RESULT BLOCK: Degree of Achievement of Goals and Objectives</b>	Improving the effectiveness of the teacher's scientific and educational activities and the university's performance as a whole.

This type of monitoring, as an element of the incentive mechanism, is a scientifically based system for selecting, processing, storing, and disseminating information on the educational, methodological, scientific, educational, and entrepreneurial results of a teacher's activities. It is aimed at providing informational, organizational, and scientific-methodological support for managing the teacher's professional growth and the quality of the educational process at the university at any given time, as well as forecasting their development and effectiveness over the future (Ferguson, 2025).

Monitoring includes five blocks: a target block; a methodological block; a subject-object block; a diagnostic block; and a performance block, each of which performs a corresponding function.

The implementation of incentive and evaluation procedures was carried out in stages and included the following phases: motivational, conceptual, project, technological, diagnostic, and final (Hedzyk et al., 2023).

The motivational stage has a psychological and pedagogical context and includes organizational measures to motivate organizers, experts, and faculty to achieve the goals and objectives of incentives. These measures include holding staff meetings across the university's structural divisions, which were devoted to reviewing incentive targets and, separately, monitoring, along with its risks and benefits for faculty.

The conceptual stage also has a psychological and pedagogical context and is aimed at developing a monitoring-based incentive concept and its theoretical justification. This was necessary for conceptualizing the meaning and content of incentive and monitoring procedures and determining the effectiveness, role, and status of organizers, experts, and faculty in incentives.

The design stage involved designing algorithms for organizing and implementing incentives and monitoring. As noted above, in accordance with the purpose of incentives and monitoring, its objectives were defined, which formed the basis for developing algorithms for implementing these processes.

The technological stage (the actual technological conditions) consisted of the practical implementation of incentive and monitoring procedures, ongoing diagnostics and self-diagnostics, monitoring and analysis of the incentive and monitoring implementation process, advisory and technological assistance, and training in working within an effective contract.

The diagnostic stage consisted of final diagnostics and self-diagnostics, rating procedures based on expert and student survey results, reflection, analysis, and discussion of the results. This stage and its content also have a psychological and pedagogical context.

The final stage continued the previous one and included the processing and coordination of data on individual (departmental, university-wide) performance indicator values, making proposals to improve the incentive procedure based on monitoring, preparing proposals for moral encouragement and calculating incentive bonuses to teachers' salaries based on the results of performance evaluation.

The groups included faculty members with practical experience at the university. The gender composition and

average age of the participants in the experiment were virtually identical.

The participants in the experiment—faculty members included in the control group—were not included in this type of incentive; their professional performance was assessed traditionally, based on data from their individual work plans for the academic year. Faculty members in the experimental group, however, were included in the proposed incentive model.

The average performance criteria for teachers in the experimental group in 2024 and 2025 exceeded those of teachers in the control group by 12.2% and 12.0%, respectively. The largest differences were observed for research (18% in 2024 and 13% in 2025), educational (32% in 2024 and 24% in 2025), and entrepreneurial (24% in 2024 and 18% in 2025). The differences between the teaching and methodological (educational) and educational criteria were insignificant and nonsignificant. Student assessments of teachers, changes in the structure of teachers' professional motivations, changes in teacher agency indicators, and the level of teachers' readiness to work under an effective contract were used as indirect or additional criteria and indicators for determining teacher effectiveness.

At the end of the formative experiment, we conducted follow-up assessments to determine the readiness of teachers in the experimental and control groups for research and educational activities under the incentives underlying an effective contract (Kwiek & Roszka, 2025). Teacher readiness for such working conditions was determined based on changes in motivational, cognitive, and activity-based readiness criteria.

An analysis of the results of determining the readiness of teachers for professional work under incentives and an effective contract at the end of the experiment revealed that the control group of teachers showed no changes in the levels of readiness under study (the dynamics of indicators ranged from 0.8 to 2.2%), while the experimental group of teachers demonstrated significant dynamics – from 13.3 to 32.8%. The values of the experimental group's readiness indicators for work under incentives and an effective contract, obtained as a result of the experiment, significantly exceed those of the control group.

#### Key research findings

1. Stimulating the scientific and educational activities of higher education teachers as a targeted process of enhancing their activities within the framework of educational, methodological, research, educational, outreach, and entrepreneurial work, based on the combined effect of conditions that ensure increased teacher effectiveness.

The purpose of incentives is to, by activating the scientific and educational activities of teachers and influencing their effectiveness, determine the zone of proximal professional development of teachers and ways to improve the effectiveness of the university as a whole.

The prerequisites for the study and substantiation of the relevance of the problem of stimulating the scientific and educational activities of higher education teachers under consideration are factors that have developed in the management of the higher education system, in the regulatory framework for higher education, in the pedagogical and psychological sciences, as well as the insufficient development of the scientific foundations for stimulating and monitoring the activities of university teachers.

2. A mechanism for stimulating the scientific and educational activities of higher education teachers, which is a theoretically substantiated process, developed, and then implemented within the space of a technological university, to activate the work of scientific and pedagogical staff, promoting their professional development (Khimchuk et al., 2023).

The key element of the incentive mechanism is monitoring the effectiveness of the scientific and educational activities of teachers, which includes five structural and functional blocks: a target block, defining the purpose and objectives of monitoring, which are focused on improving the quality of training specialists at the university, the quality of university management, the quality of the faculty, and the formation of the image of an «effective university» (Nebelenchuk et al., 2024); a methodological block, characterizing the psychological and pedagogical principles underlying the monitoring of the effectiveness of the scientific and educational activities of teachers; a subject-object block, containing information on the focus and participants of the monitoring; a diagnostic block, including the actual monitoring procedures used during monitoring, such as measurement, evaluation, comparison, counting, analysis, rating, and a results block, reflecting the degree of coincidence of the obtained results with target or planned values.

3. Pedagogical conditions for stimulating the scientific and educational activities of higher education teachers are a purposefully created environment within the university in which a combination of organizational, technological, and psychological-pedagogical factors or means that motivate teachers to effectively carry out their activities are presented in close interaction. This is a set of psychological-pedagogical foundations or non-material incentives that determine the effectiveness of the scientific and educational activities of higher education teachers.

The organizational, technological, and psychological-pedagogical incentive conditions that comprise the complex of pedagogical conditions constitute the environment for

implementing a regulated and targeted process for activating the scientific and educational activities of teachers by transforming it into a system of consistent, interconnected, and scientifically based procedures that, using algorithms as the language of step-by-step design, enable the general conceptual design of incentives to be translated into the form of an individual teacher's project for increasing the effectiveness of their activities.

4. The evaluation of incentive results used to determine the effectiveness of a higher education teacher's research and educational activities involves two sets of criteria: primary and secondary.

The primary group includes criteria for teaching and methodological, research, educational, outreach, and entrepreneurial activity, along with corresponding indicators, divided into three categories: quantitative, qualitative, and relative.

The methodology for determining the effectiveness and efficiency of a teacher's professional activity includes the following steps: based on the obtained monitoring data, planned and actual indicators are compared, and then the deviations between actual and planned data are calculated for each indicator value. Actual indicator values that are both high and as close as possible to planned values are considered optimal.

Supplementary criteria for the effectiveness of a teacher's research and educational activities include student assessments of the teacher, changes in the structure of the teacher's professional motivations, and data on the dynamics of the teacher's agency indicators and their level of readiness to work under an effective contract.

The scientific novelty of the study lies in the following:

- a scientifically based method for improving psychological and pedagogical approaches to planning, organizing, and evaluating the results of higher education teachers' research and educational activities has been proposed, in which the teacher's activity is presented as an object of incentives;
- a mechanism for stimulating the research and educational activities of higher education teachers has been substantiated and developed based on monitoring the effectiveness of their activities, including target, methodological, object-subject, diagnostic, and results-based blocks;
- pedagogical conditions for stimulating the research and educational activities of higher education teachers have been defined, substantiated, and tested in the space of a technological university as an organized process aimed at implementing the incentive mechanism and improving the quality and productivity of the professional activities of research and teaching staff;

- definitions of the concepts “pedagogical conditions for stimulating scientific and educational activities of a higher education teacher”, “monitoring the effectiveness of a teacher’s professional activity” have been introduced into the scientific thesaurus as necessary methodological and research elements that develop the terminological apparatus of the pedagogical aspects of the problem of stimulating work in higher education.

## CONCLUSIONS

The study identified and characterized the epistemological grounds for evaluating the results of higher education teachers’ scientific and educational activities from the perspective of their effectiveness. It substantiated the necessity and feasibility of applying pedagogical conditions to stimulate teachers’ scientific and educational work, aiming at both professional and personal development.

The research highlighted contradictions, prerequisites, and principles for developing a mechanism and constructing pedagogical conditions that can be effectively used in the professional development of academic staff. Furthermore, it expanded the theoretical understanding of the factors that promote continuous updating of teachers’ professional skills and enhance the effectiveness of their scientific and educational activities.

The results complemented the comprehension of scientific and methodological support for stimulating various components of university teachers’ professional activity and designing pathways for their professional growth. The main group of criteria included educational and methodological, research, teaching, outreach, and entrepreneurial indicators, classified into quantitative, qualitative, and relative categories. Additional criteria considered students’ assessments, changes in faculty motivation, agency indicators, and readiness for effective contractual arrangements.

Notably, the experimental group demonstrated significantly higher readiness indicators for working under incentives, performance monitoring, and effective contracts compared with the control group. Overall, the implementation of the proposed model and pedagogical incentive conditions contributed to a substantial increase in motivational, cognitive, and activity-based indicators of faculty readiness for research and educational work under an effective contractual arrangement.

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