

The Role of the Institutional Support Allocation System in Enhancing Scientific and Artistic Productivity at the University North

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Abstract: The system for awarding scientific and artistic grants at the University North serves as a key strategic instrument for advancing research and artistic productivity while strengthening the University's institutional recognition. By applying clearly defined criteria, transparent procedures, and comprehensive professional support provided by the Department for Scientific, Artistic Work and International Cooperation, the system ensures the efficient allocation of financial resources to researchers and teams whose projects demonstrate substantial scientific and societal value. An analysis of data from 2020-2024 reveals a consistent increase in the number of papers published in journals indexed in the Web of Science (WoS) and Scopus databases, with technical sciences, biomedicine, and social sciences emerging as the most productive disciplines. The grant system promotes interdisciplinary collaboration, the development of research teams, and the dissemination of findings through international databases, thereby fostering a culture of scientific excellence and open science. These findings confirm that institutional grants represent far more than a financial mechanism, they constitute a long-term investment in knowledge creation, innovation, and international competitiveness. At the same time, they enhance the scientific visibility and reputation of the University North at both national and international levels.

Keywords: institutional support; interdisciplinary collaboration; published papers; research funding; scientific productivity; scientific research and artistic work; University North

1 INTRODUCTION

In the contemporary higher education and research environment, scientific productivity has become one of the key indicators of the success of higher education institutions [1]. Universities are increasingly positioning themselves as key actors in social and economic development, with scientific research, knowledge transfer, and international recognition playing particularly significant roles. Science is a crucial driver of economic and social progress, and it is in every country's interest to assess its position within the global scientific community and to shape its scientific policies accordingly. An increase in the number of scientific publications in relevant international databases, such as Web of Science (WoS) and Scopus, directly contributes to enhancing the reputation of individual institutions and ensures better competitiveness within national and global scientific policies [2]. Productivity is measured by the number and type of papers an author has published within a specific scientific field or discipline [3].

In this context, institutional funding models for scientific and artistic projects are key tools for strategically managing research. They enable targeted investment in high-potential projects, foster interdisciplinary collaboration, and motivate researchers to publish in high-quality, peer-reviewed international journals. Rapid improvement in research quality and competitiveness is essential, as "...the strength of a country's science depends on the strength of its elite, where the term 'elite' is used here in the most positive sense of the word." [4]. Furthermore, research grants play an important role in the development of young researchers and in raising the overall quality of teaching, scientific, and artistic work.

University North, a young but rapidly growing public higher education institution, has developed a model for allocating scientific grants with the aim of systematically enhancing its research and artistic activities. Through annual calls for proposals, transparent criteria, and organizational support provided by the Department for

Scientific, Artistic Work and International Cooperation, the University ensures the consistent implementation of mechanisms that allow researchers to develop and realize their research initiatives. The evaluation of research activities is most often measured through scientific productivity, citation analyses, and the status of the journals in which the works are published [5].

This paper examines the effectiveness of the model over the period 2016-2024, with detailed analyses concentrated on the years 2020-2024. Particular emphasis is placed on the number of publications indexed in the Web of Science and Scopus databases, the allocation of financial resources, and the scientific fields demonstrating the highest levels of research productivity.

An important indicator is the advancement of employees to academic titles, based on the published works supported by these grants. The goal is to evaluate the impact of institutional support on scientific output through quantitative and comparative indicators and to contribute to forming recommendations for further improvement of the scientific policy of University North, striving towards excellence [6].

2 REGULATION OF SCIENTIFIC RESEARCH AND ARTISTIC WORK GRANTS AT UNIVERSITY NORTH

Based on the Statute of the University North [7], the Senate of the University North adopted the Regulation on Support for Scientific Research and Artistic Work at the University North [8]. The Regulation on Support for Scientific Research and Artistic Work defines the procedures for announcing calls, selection, and evaluation of submitted support applications, as well as the evaluation and control of the results of support for scientific research and artistic work financed from the State Budget of the Republic of Croatia and the University North's own funding sources [9].

In accordance with the Regulation on the Organization and Systematization of Workplaces at the University North from 2024 [10], the Department for Scientific, Artistic

Work and International Cooperation of the University North carries out all organizational and administrative tasks within the scope of the artistic, scientific research, and innovation activities of the University North. As a confirmation of its institutional commitment to scientific and artistic development, adopted is the Scientific Research and Artistic Strategy of the University North for the period 2021-2027, which defines thematic priorities, implementation mechanisms, and instruments for monitoring results. This strategy includes the goals aligned with the European Research Area, including public accessibility of results, protection of intellectual property, and social responsibility of scientists and artists [11].

Scientific and artistic productivity at the University North is grounded in the principles of open science, academic freedom, and ethical research practices. The University actively fosters the development of research capacity through multi-year strategic programs across the social sciences, technical sciences, biomedical sciences, humanities, and the arts. A multidisciplinary research approach is systematically promoted, with particular emphasis on strengthening the link between science and the economy and generating innovative solutions to address societal challenges.

The University places a strong emphasis on fostering multidisciplinary by encouraging collaboration across diverse scientific domains and artistic disciplines. This integrative approach seeks to address complex societal challenges and to generate innovative, cross-sectoral solutions with tangible societal impact. To support these objectives, the University has established a comprehensive set of institutional mechanisms, including competitive funding schemes, infrastructural support, structured mentoring programs, and scholarships. In addition, the University actively promotes the dissemination of research and artistic achievements through the organization of academic conferences, scientific symposia, and public engagement initiatives, most notably, the annual Science Festival, which serve to strengthen the dialogue between academia and society.

The University actively promotes open science and the translation of research outcomes through extensive international cooperation and partnerships with other higher education institutions, research centers, and industrial organizations. These collaborations facilitate access to advanced technologies and contemporary methodologies, thereby enhancing the quality, relevance, and reach of the University's scientific and artistic outputs [11].

The University North fosters a stimulating and inclusive academic environment in which scientific inquiry and artistic creativity mutually complement and enrich one another. This approach institutionalizes a model of responsible, transparent, and strategically guided productivity that contributes sustainably to the advancement of higher education, research, and artistic practice [11].

In addition to utilizing national databases such as CroRIS [12] for monitoring research productivity, the University systematically evaluates all dimensions of scientific and artistic work. Through these endeavors, University North reaffirms its role as a higher education institution that actively contributes to the development of

science, education, and culture at both the regional and international levels.

3 CALL FOR SUPPORT FOR SCIENTIFIC RESEARCH AND ARTISTIC WORK OF THE UNIVERSITY NORTH

Support for scientific research and artistic work consists of earmarked financial funds intended to finance scientific research and artistic activities. The call for support is announced by the Senate of the University North once a year, usually at the end of the calendar year [9]. Applications for the call are submitted using the prescribed form, which is available on the University North's website during the call period. Completed forms in electronic format are submitted to the Department for Scientific, Artistic Work and International Cooperation of the University North. Research teams applying for the call must consist of at least three and at most eight researchers, with each team required to have one leader and between two and seven collaborators [8, 9].

The support team leader can only be an employee of the University North (with at least 50% employment) who holds an academic-scientific, scientific, or academic-artistic title. Collaborators on the support projects may include: employees of the University North holding academic-scientific, scientific, or academic-artistic titles; university employees who have a researcher identification number; and university employees who are doctoral candidates or assistants in scientific and artistic fields. A University North employee may participate as a leader in one research team and as a collaborator in another research team within the same call. A collaborator may be included in two research teams, i.e., in two support proposals submitted for evaluation in the same call. The call is generally open for one month [8, 9].

3.1 Applications for the Call

Applications must be submitted using the designated form corresponding to the specific scientific or artistic field for which support is sought. The application form is available on the University North website for the duration of the Call. Completed and signed forms must be submitted in electronic format (.xls, .xlsx, or other compatible Microsoft Excel formats) to the Department for Scientific and Artistic Work and International Cooperation at the University North.

As an attachment to each submitted work, applicants must clearly indicate the proof and include it with the application. This proof demonstrates how the specified work is represented in the displayed scientific database and its categorization. Proof includes confirmation from the University North library manager, a printout showing the visibility of the journal/conference or work in the scientific database, a copy of the database/conference cover page and/or imprint showing representation in the scientific database, or other relevant evidence. Applicants must also enter the CROSBID ID for each submitted work. Each applicant who has previously received approved support is required to submit proof that it has been registered in the CroRIS database and linked to works in the same database, all in accordance with the submitted code and internal rules established at the University North level [11, 12].

The documents required for a successful application include an unsigned electronic form, a completed and signed application form, and additional attachments (publications, certificates, proof of publications) [13-18].

3.2 Application Form

The application form for participation in the Call for Support for Scientific Research and Artistic Work is created in Excel format and structured into seven interconnected sections (from A to G) [13].

Each section of the form refers to a specific element of the application and enables a detailed overview of the planned project, activities, and accompanying data.

- A. General section - contains basic information about the project, institution, and fundamental administrative data.
- B. Project Leader and Publications - includes information about the project leaders, their previous scientific/artistic work, and relevant publications.
- C. Work Plan - presents the objectives, methodology, and timeline of the proposed research or artistic work.
- D. Financial Plan - contains a detailed overview of requested funds and their planned use.
- E. Other Sources of Funding - shows existing or expected additional sources of support related to the project.
- F. Cost Tracking - intended for monitoring and recording expenses incurred during project implementation.
- G. Report - intended for the final reporting on results and the realization of project activities.

This form structure ensures transparency, clarity, and completeness of the application and enables quality evaluation of project proposals [13].

4 AMOUNT OF FINANCIAL SUPPORT

The allocation of funding for individual scientific fields is determined by a decision of the University North Senate prior to the publication of the call, based on the availability of financial resources designated for scientific research and artistic activities. In cases of exceptional quality, research groups and project proposals may be awarded additional funding beyond the standard amounts allocated for their respective fields. The request for additional funding based on the excellence of the group members must be clearly and thoroughly justified in the application [13].

Table 1 Distribution of funds by scientific and artistic fields - Call 2025 [19]

Field of Science and Arts	Percentage / %	Amount / EUR
Technical	36.00	124000,00
Biomedical	17.00	58650,00
Biotechnical	13.00	44850,00
Social Sciences	21.00	72450,00
Humanities	6.00	20700,00
Arts	7.00	24150,00
Total	100	345000,00

Priority in obtaining support is given to proposals that are not funded from other sources, provided that the conditions and criteria prescribed by the call are met. Research can be divided into two phases across two call years, whereby the applicant is obliged to apply for and carry out the second phase of the research, taking into account the eligibility of costs, reporting obligations, and

the number of publications corresponding to the amount(s) of awarded support published in journals indexed in the Web of Science database for STEM fields, or the number of publications in journals indexed in the Web of Science and Scopus databases for social, humanities, and interdisciplinary fields of science and arts [8, 9, 13].

The maximum amount of funds for each applied support is proportional to the number of publications by the leader and collaborators published in journals indexed in the Web of Science database for STEM fields, or the number of publications published in journals indexed in the Web of Science and Scopus databases for social, humanities, and interdisciplinary fields of science and arts in the last two years, whereby each publication is divided equally among co-authors who are employees of the University North [8].

Tab. 1 shows the distribution of funds by scientific and artistic fields relating to the 2025 Call.

5 EVALUATION AND RANKING PROCEDURE

According to Article 7 of the Regulations on Support for Scientific Research and Artistic Work at the University North, the evaluation and ranking process of received applications is conducted by the field councils using the prescribed form, based on the criteria of: scientific publications and artistic works, efficiency in the use of allocated funds from previously completed support, and realization of the previously completed support.

The evaluation of applications is carried out through the following phases:

Phase 1. Applications submitted to the Call for Support for Scientific Research and Artistic Work at the University North are received by the Department for Scientific, Artistic Work and International Cooperation of the University North, which conducts an administrative check to verify if the application is complete, timely, and meets the basic criteria of the call, and prepares a report accordingly [8].

Phase 2. The financial plan of the application is reviewed by the Department of Financial Operations, Accounting, and Procurement of the University North, which provides an opinion on each financial plan and issues recommendations for possible amendments or revisions of the financial plan [8].

Phase 3. If necessary, the financial plan is sent back to the applicant for revision. After receiving the changes, the Field Council verifies whether the amendments were submitted on time and according to instructions, then assigns scores and reduces requested amounts if any costs are deemed ineligible [8].

Phase 4. After the checks, amendments, and supplements, the evaluation and ranking procedure is conducted by the relevant Field Councils based on proposals from three-member committees within each council. Members of these committees cannot be leaders of research groups applying for support but can participate as collaborators. Committee members are excluded from evaluating applications in which they participate as collaborators in research groups [8].

Phase 5. The evaluation and ranking process uses the prescribed form and considers the following criteria: realization of previous support, scientific publications,

submitted financial reports for previously awarded supports, and records of previous support registered in the CroRIS database linked to works in the CROSB database. The Croatian Scientific Bibliography database - CROSB has become part of the Croatian Science Information System - CroRIS [8, 12].

Phase 6. The results of the evaluation and ranking of received applications are published by the field councils on the University North's website [8].

Phase 7. Appeals against the evaluation and ranking outcomes are accepted by the field council within five days of the publication of the evaluation results. The council establishes a Commission that decides on the validity of the appeal within five days of its receipt [8].

Phase 8. After the preliminary selection, the field council proposes a ranking list of projects to the University Senate, including the proposed funding amounts for each research group [8].

Phase 9. The final decision on the allocation of funds for support is made by the University Senate based on proposals from the authorized field councils regarding the distribution of funds within scientific and artistic fields [8].

Phase 10. The Senate's decision on the final allocation of funds for support is published on the University North's website [8].

In the final report, it is mandatory to list the number and titles of scientific publications resulting from the support, along with details of each published work as required in the report form. The total amount of awarded support must correspond to the number of publications resulting from the support, with each publication counted according to journals indexed in the Web of Science for STEM fields, or journals indexed in Web of Science and Scopus for social sciences, humanities, and interdisciplinary fields of science and arts, where each publication is divided equally among co-authors employed at the University North [8].

6 ANALYSIS OF APPROVED GRANTS FOR SCIENTIFIC RESEARCH AND ARTISTIC WORK AT THE UNIVERSITY NORTH

The data on approved grants for scientific research and artistic work at the University North from 2016 to 2024 indicate a clear upward trend in both the number of awarded grants and the total amount of allocated and available funding, as shown in Tab. 2.

Table 2 Overview of approved grant amounts and number of allocated grants by year [20-31]

<i>T</i>	Allocated Grants by Year	Number of Grants
2016	152457,00 HRK	11
2017	188391,63 HRK	12
2018. - 1 st Round	274706,00HRK	16
2018. - 2 nd Round	308194,00 HRK	17
2018. - 3 rd Round	109813,00 HRK	6
2019	1246.272,58 HRK	33
2020. - 1 st Round	1676231,90 HRK	44
2020. - 2 nd Round	187000,00 HRK	6
2021	1394397,00 HRK	35
2022	1555998,60 HRK	34
2023	299949,08 EUR	46
2024	300000,00 EUR	52

For the announced calls for grants for scientific research and artistic work at the University North, the amounts awarded were 152457,00 HRK for 2016 for 11 grants, and 188391,63 HRK for 2017 for 12 grants, indicating the initial stages of the grant allocation system's development.

A significant shift occurred in 2018, when grants were distributed through three rounds of calls, with a total of 39 approved grants and an amount exceeding 690000,00 HRK. The largest number of grants, 17, was awarded in the second round, while 6 grants were awarded in the third round.

In 2019, a strong increase in grant amounts was recorded, with allocated funds rising to 1246272,58 HRK and 33 grants awarded. This upward trend continued in 2020, when the first round awarded 1676231,90 HRK across 44 grants. In 2020, a second round of calls was also held, awarding 6 grants totaling 187000,00 HRK, making it one of the most successful years in terms of total financial support granted.

In 2021 and 2022, approved amounts were 1394397,00 HRK and 1555998,60 HRK respectively, with the number of grants ranging between 34 and 35. In 2023, the number of grants further increased to 46, and in 2024, 52 grants were awarded, the highest number of grants awarded in a single year to date.

The period from 2016 to 2024 shows continuous development and expansion of the grant-awarding program at the University of North. The program has proven to be an important support instrument, and the growth in the number of grants in 2024 confirms its success and the need for further development.

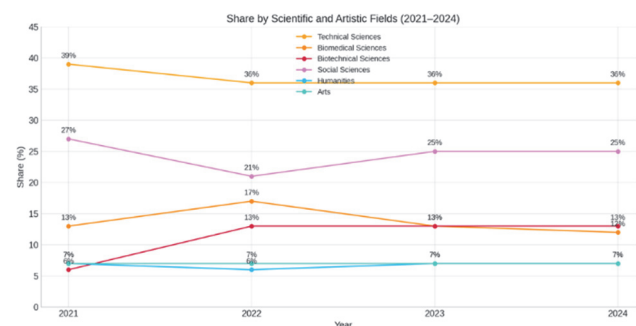


Figure 1 Overview of granted support by fields of science and arts [28-31]

Fig. 1 shows the changes in the representation of individual scientific and artistic fields within the Call for Grants for Scientific Research and Artistic Work at University North during the period from 2021 to 2024, expressed in percentages. The presented data provide insight into developmental trends within the University North's grant allocation system and indicate shifts in interests, investments, and strategic priorities of the university.

The technical field records a slight but noticeable decline in its share, from 39% in 2021 to 36% in 2022, after which the values stabilize and remain unchanged through the rest of the observed period. Despite the initial decrease, the technical field retains the position of the most represented scientific area, reflecting the university's predominant focus on STEM fields.

The biomedical field shows the most significant fluctuations during the analyzed period. In 2022, its share sharply rises to 17%. However, by 2023, it drops to 12%, maintaining this level also in 2024.

The biotechnical field experiences a strong increase in share already in 2022, rising from an initial 6% in 2021 to 13%, more than doubling its share. This level remains constant through 2023 and 2024.

The social sciences display dynamic development with changes in their share during the observed period. After an initial 27% in 2021, it decreases to 21% in 2022, then rises again to 25% in 2023, maintaining this level in 2024. Although social sciences have not reached their 2021 share again, they clearly position themselves as the second most represented area, after technical sciences.

The humanities and arts fields show a high degree of stability throughout the entire period. The share of humanities slightly varies between 6% and 7%, while the arts field consistently holds a 7% share.

The analyzed data point to a relative stabilization of the shares of individual fields after 2022, with more pronounced changes occurring in the biomedical and biotechnical fields. Technical and social sciences continue to hold leading positions in representation, while other fields maintain relatively constant shares.

7 ANALYSIS OF PUBLISHED SCIENTIFIC PAPERS IN WOS AND SCOPUS DATABASES AT THE UNIVERSITY NORTH (2020 – 2024)

Based on the scientific grants awarded for research and artistic work at the University North during the observed years, researchers and their teams have published scientific papers and participated in scientific conferences. These activities have contributed to career advancement in scientific-teaching positions in accordance with the Regulations on Appointment to Scientific Titles [32]. Similarly, the advancement of artists is carried out in line with the Regulations on the Conditions for Appointment to Artistic-Teaching Titles [33].

The artistic activities of professors are evident both nationally and internationally, through the premiere presentation of artistic works at events of international significance, participation in major festivals, and the achievement of outstanding results. On the national level, artistic work has been realized through works of art recognized as top achievements of national significance, showcased at exhibitions and artistic festivals.

The University monitors and evaluates all aspects of research work, including artistic creativity, for example, supporting the organization of events such as the 30th anniversary of an artist's career and celebratory concerts, all based on the grants awarded for scientific research and artistic work.

Between 2020 and 2024, the University North recorded continuous scientific activity, as reflected in the number of scientific publications indexed in the relevant scientific databases Web of Science (WoS) and Scopus. Data for this five-year period show certain fluctuations in annual scientific output but generally demonstrate a stable level of research and scientific production, as presented in Tab. 3.

Table 3 Number of published scientific papers in WoS and Scopus databases [46, 47]

Number of Published Scientific Papers in WoS and Scopus Databases (2020-2024)		
Year	WoS	Scopus
2020	191	59
2021	243	73
2022	219	49
2023	199	52
2024	223	77

The highest number of papers indexed in the WoS database was recorded in 2021, with 243 papers, while the lowest number was registered in 2020, with 191 papers. In the Scopus database, the highest number of papers was observed in 2024, with 77 papers, and the lowest in 2022, with 49 papers. The analysis shows that the highest annual scientific output was achieved in 2021 with a total of 316 scientific papers, whereas the lowest output was recorded in 2020 with a total of 250 papers. The year 2024 shows an increase in the number of published papers, with a total of 300 publications, indicating a strengthening of research activities.

An analysis of average values revealed that scientists from the University North published on average 215 papers annually in the WoS database and 62 papers in the Scopus database, amounting to a total of 277 scientific papers per year. In all analyzed years, the number of papers indexed in WoS was higher compared to Scopus, reflecting the dominant presence of University North researchers in journals indexed by WoS, which corresponds to the fact that these researchers primarily come from STEM fields, technical sciences, biomedicine and health, and biotechnical areas.

The increase in the number of published papers in 2021 can be attributed to intensified scientific engagement during the global COVID-19 pandemic, during which many universities and research institutions reported increased scientific output. The year 2024 again shows positive progress.

7.1 Analysis of Allocated Funding for Scientific Research and Artistic Work at the University North and Published Scientific Papers from 2020 to 2024

A comparative analysis of the annual awarded grant amounts and the number of published scientific papers at the University North from 2020 to 2024 provides valuable insights into the dynamics of research development and offers guidance for the further enhancement of the research support system, as shown in Fig. 3.

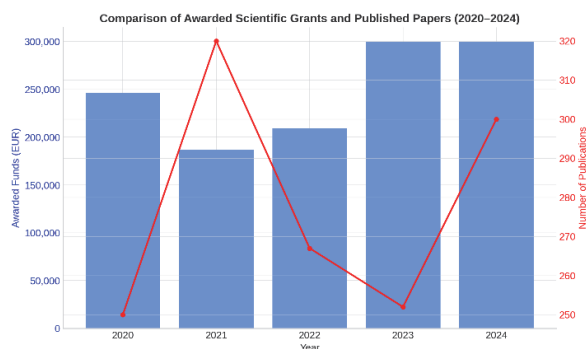


Figure 2 Comparison of awarded scientific grants and published papers (2020-2024)

Over the observed period, the scientific output at the University North exhibits a pattern of consistent continuity, with the number of published research papers reflecting a sustained and gradually increasing trend. The year 2021 stands out with the highest number of publications (316), which may signify the cumulative effect of earlier investments and the progressive maturation of the University's research capacity. In 2023 and 2024, the University allocated its highest annual levels of scientific funding, approximately €300000 per year, demonstrating a robust institutional commitment to advancing scientific excellence and strengthening long-term research potential. The data further reveal that scientific productivity does not follow a linear correlation with annual funding levels. This divergence reflects the inherently multi-year nature of the research process, which encompasses stages of conceptualization, implementation, and dissemination. These findings highlight the critical importance of sustained, strategically oriented support structures that foster an environment conducive to high quality and enduring scientific activity.

In addition to quantitative indicators such as the number of published papers, qualitative measures of research impact, including citation analysis and altmetric data, represent an important dimension in assessing institutional performance. Although these indicators were not systematically included in the present analysis due to limited data availability for the observed period, recent reports from the University North indicate a continuous increase in citation rates, confirming the growing relevance of research outputs and their alignment with the global Sustainable Development Goals [34].

The analysis of allocated funds for scientific and artistic activities and published research papers at the University North between 2020 and 2024 provides valuable insight into the dynamics of research development and offers guidelines for further improvement of the institutional research support system. During the observed period, the University's scientific output demonstrated consistent growth, with a gradual increase in the number of published papers. The years 2023 and 2024 stand out in particular, as they recorded the highest annual levels of research funding, reflecting a strong institutional commitment to fostering scientific excellence and long-term research capacity.

In addition to quantitative indicators, an increase in citation rates of scientific publications was also recorded, indicating the growing relevance and visibility of research conducted at the University North. The data used in the analysis were obtained from the official document Annual Activities 2024/2025 [34]. Overall, the results suggest that the University North is achieving measurable progress in enhancing its research productivity, driven by institutional investments, thereby contributing to the broader advancement of scientific excellence and strengthening the University's international reputation [34].

Overall, the results indicate that the University North is making measurable progress in enhancing its scientific productivity, driven by institutional investment, thereby contributing to the broader advancement of scientific excellence and elevating the University's international profile.

7.2 National Context and Comparative Analysis of Research Productivity

When situated within the broader national context, the research performance of the University North reflects trends comparable to those observed across other Croatian higher education institutions. According to the Research Output 2024 report published by the Faculty of Economics and Business, University of Zagreb (EFZG), a leading national institution in the field of economics and business administration, the period from 2020 to 2024 was characterized by sustained growth in scientific productivity and an increasing proportion of publications in first-quartile (Q1) and second-quartile (Q2) journals. These developments indicate a systemic progression within the Croatian research landscape toward enhancing the qualitative dimensions of scientific work. The University North mirrors these tendencies through the growing visibility and citation impact of its research outputs, accompanied by a steady increase in institutional investment in scientific activities [35].

7.3 Analysis of Scientific Productivity by Research Areas at the University North (2022-2024)

Observing the scientific productivity of the academic staff at the University North through the number of published papers in relevant scientific databases, several significant trends emerge that indicate developmental directions within specific scientific fields, as shown in Tab. 4.

Table 4 Scientific productivity by fields of science (2022-2024)

	Scientific Field	WoS	Scopus
	Year 2022	Biomedicine and Health	61
	Biotechnical Sciences	28	4
	Social Sciences	42	18
	Humanities	3	4
	Technical Sciences	80	11
	Natural Sciences	5	0
	Total:	219	49
Year 2023	Scientific Field	WoS	Scopus
	Biomedicine and Health	62	9
	Biotechnical Sciences	24	3
	Social Sciences	28	14
	Humanities	0	0
	Technical Sciences	79	25
	Natural Sciences	6	1
	Total:	199	52
Year 2024	Scientific Field	WoS	Scopus
	Biomedicine and Health	62	3
	Biotechnical Sciences	32	10
	Social Sciences	45	28
	Humanities	2	4
	Technical Sciences	80	30
	Natural Sciences	2	2
	Total:	223	77

Technical sciences consistently achieve the highest level of scientific output across all three years under review, with a particularly pronounced share of papers indexed in the WoS database.

In the field of social sciences, there is a notable increase in the total number of publications in 2024, especially in the Scopus database. This trend may reflect an increased international dissemination of research results

and a greater orientation toward open-access journals and faster availability.

The biomedical and health sciences field shows a stable number of publications in WoS throughout the three years, while the number of publications in Scopus gradually decreases. This pattern might indicate researchers' preference for high-impact journals primarily indexed in WoS, as well as a focus on publication quality.

Biotechnical sciences experience growth in both databases during 2024, suggesting a possible positive impact of institutional investments and increased scientific activity within this field.

Humanities continue to produce a relatively low number of publications in WoS, with somewhat higher representation in Scopus during 2024.

Natural sciences maintain a steady output of scientific papers, with a slight increase observed in 2023 and 2024, possibly indicating a gradual strengthening of research capacities and a greater focus on publishing in indexed journals.

8 INSTITUTIONAL FUNDING AND SCIENTIFIC PRODUCTIVITY IN AN INTERNATIONAL CONTEXT

Within the contemporary higher education landscape, institutional funding for research and artistic activities is widely recognized as a pivotal mechanism for fostering scientific excellence and enhancing the international visibility of universities. Empirical evidence indicates that well-designed intra-institutional support models exert a measurable influence on research productivity, including growth in publication output within recognized international databases and the strengthening of inter-institutional and interdisciplinary collaboration networks [36].

Studies further demonstrate that transparent systems for the allocation and evaluation of institutional grants contribute to the development of a culture of accountability and academic excellence. Achieving an optimal balance between the concentration and dispersion of financial resources remains essential, as excessive concentration of funding may diminish the marginal productivity of individual researchers or disciplines [37]. Conversely, strategically targeted investment in research teams with high developmental potential has been shown to be an effective approach for generating tangible advancements in both scientific and artistic production [38].

The quality of outcomes derived from funded projects is reflected not only in the quantity of published papers but also in their scientific impact, as evidenced by publication in high-impact journals and by citation performance [39]. These indicators serve as critical measures of research excellence and play a pivotal role in enhancing the international visibility and reputation of universities. Empirical evidence further suggests that projects supported through institutional funding mechanisms exhibit a higher likelihood of generating publications in top-tier journals and fostering a greater number of international research collaborations [44].

Furthermore, institutional policies that encompass structured mentoring, administrative support, and the promotion of open science have been identified as critical determinants in enhancing the efficiency and overall

quality of the research process [40, 42]. Examples of best practice within the European context, such as Russia's Project 5-100, demonstrate that systematic institutional investment in research capacity development contributes to an increased number of internationally indexed publications and strengthens the global competitiveness of universities [41].

Equally significant is the role of bibliometric databases in the evaluation of scientific performance. The Web of Science and Scopus databases remain the two principal global platforms for monitoring research productivity; however, variations in their disciplinary coverage, inclusion criteria, and indexing policies may influence the interpretation and comparability of bibliometric indicators [43].

At the European level, numerous studies highlight widening disparities in research productivity between institutions that implement proactive and well-structured research funding policies and those that adopt a less systematic approach. In this regard, the institutional model of the University North can be regarded as an example of good practice aimed at fostering a sustainable environment conducive to scientific and artistic excellence [45].

9 CONCLUSION

The system for awarding grants for scientific and artistic work at the University North constitutes a key strategic instrument for enhancing the research and creative productivity of academic and research staff, while simultaneously strengthening the University's scientific and artistic visibility at both the national and international levels. By establishing clearly defined procedures and criteria, set out in the official Regulations and implemented through regular annual calls, the University ensures transparency, accountability, and efficiency in the allocation of financial resources to projects demonstrating high scientific or artistic potential.

The allocation of institutional grants generates a broad spectrum of positive outcomes. Most notably, it provides researchers and artists with the material and infrastructural resources necessary to undertake high-quality scientific and artistic projects. In addition, it functions as a motivational mechanism that promotes the dissemination of research outcomes through reputable international databases, such as the Web of Science and Scopus, thereby contributing to higher citation rates and enhancing the University's academic visibility. A particular strength of the grant system lies in its capacity to foster a collaborative research culture through the formation of interdisciplinary teams composed of members from diverse academic and professional fields. This, in turn, facilitates inter-institutional cooperation and reinforces the University's commitment to a dynamic and integrative research environment.

A central role in the implementation of the institutional grant system is performed by the Department for Scientific, Artistic Work and International Cooperation, which provides comprehensive organizational and professional support to academic and research staff across all phases of the project cycle, from application and evaluation to implementation and final reporting. This integrative approach facilitates systematic monitoring of outcomes,

ensures alignment with the University's strategic priorities, and contributes to the continuous enhancement of the quality and impact of scientific and artistic outputs.

An analysis of quantitative indicators, including the number of approved grants, total allocated financial resources, and the volume of publications indexed in the Web of Science (WoS) and Scopus databases, for the period 2020-2024 demonstrates a consistent upward trajectory in the University's research activity. Notably, 2024 marks the most productive year in terms of both publication output and awarded funding, thereby underscoring the University's sustained institutional commitment to strengthening the research dimension of its academic mission.

Comparative analysis across disciplinary areas highlights the predominance of the technical sciences in publication volume and researcher engagement, while the social sciences and biomedical sciences also maintain a stable and significant presence. Although less represented in quantitative terms, the humanities, natural sciences, and the arts play a crucial role in promoting disciplinary diversity and fostering the development of interdisciplinary and cross-sectoral research initiatives.

When situated within the broader national context, the research performance of the University North mirrors the positive trends in scientific productivity observed across Croatian higher education institutions, including the Faculty of Economics and Business, University of Zagreb. These developments reflect the gradual maturation of the national research system and its growing emphasis on enhancing the quality and international recognition of scholarly work. In this regard, the University North model may be viewed as an example of good practice in establishing a sustainable and stimulating environment for the advancement of scientific and artistic excellence.

The findings of this analysis affirm that the institutional grant system functions not merely as a financial mechanism but as a long-term strategic framework for managing and fostering scientific and artistic development. Anchored in the principles of excellence, transparency, and accountability, the model exemplifies the University North's commitment to positioning science and the arts as fundamental drivers of social, cultural, and technological progress. Institutional grants therefore represent a strategic investment in the advancement of knowledge, innovation, and global competitiveness, serving as a catalyst for the sustained engagement of academic and research staff in high-quality, socially relevant research and creative work.

10 REFERENCES

- [1] *Law on Higher Education and Scientific Activity*. (2022). Official Gazette of the Republic of Croatia, No. 119/2022.
- [2] Mitrović, G. (2013). Representation of Croatian scientific and professional journals in the Web of Science and Scopus databases with a review of social and human sciences. *Bulletin of Croatian Librarians*, 56(4), 129-144.
- [3] Čavar, D., Čavar, M., Barbarić, M., & Šimić, J. (2021). Measuring productivity and the impact of scientific work. *Health Gazette*, 7(1).
- [4] Maksić, Z. & Vianello, R. (2008). Scientific excellence and competitiveness: Opinions and comments. *Chemistry in Industry*, 57(3), 123-129.
- [5] Briški, M. (2014). Altmetrics - a new indicator of the impact of scientific activity. *Bulletin of Croatian Librarians*, 57(4), 189-198.
- [6] Družić, I. (2023). The role of excellence criteria in the development of science. *Collection of the Faculty of Law in Zagreb*, 73(2-3), 527-560. <https://doi.org/10.3935/zpfz.73.23.14>
- [7] University North. (2023). *Statute of the University North*.
- [8] University North. (2025). *Regulation on Support for Scientific Research and Artistic Work at University North*.
- [9] University North. (2025). *Call for Support for Scientific Research and Artistic Work 2025*.
- [10] University North. (2024). *Regulation on Organization and Job Classification*.
- [11] University North. (2021). *Scientific Research and Artistic Strategy 2021-2027*.
- [12] *CroRIS - Information System of Science in Croatia*.
- [13] University North. (2025). *Guidelines for Filling in the Application Form for Research and Artistic Support 2025 (Appendix 2)*.
- [14] University North. (2025). *Criteria - Council of the Humanities Field (Appendix 3.1)*.
- [15] University North. (2025). *Criteria - Council of the Social Sciences Field (Appendix 3.2)*.
- [16] University North. (2025). *Criteria - Council of the Technical and Biotechnical Sciences Field (Appendix 3.3)*.
- [17] University North. (2025). *Criteria - Council of the Natural Sciences, Biomedicine and Health Field (Appendix 3.4)*.
- [18] University North. (2025). *Criteria - Council of the Arts Field (Appendix 3.5)*.
- [19] University North. (2025). *Decision on the Final Allocation of Funds for Research and Artistic Support 2025*.
- [20] University North. (2016). *Decision on the Final Allocation of Funds for Research and Artistic Support*.
- [21] University North. (2017). *Decision on the Final Allocation of Funds for Research and Artistic Support*.
- [22] University North. (2018). *Decision on the Final Allocation of Funds for Research and Artistic Support (Round I)*.
- [23] University North. (2018). *Decision on the Final Allocation of Funds for Research and Artistic Support (Round II)*.
- [24] University North. (2018). *Decision on the Final Allocation of Funds for Research and Artistic Support (Round III)*.
- [25] University North. (2019). *Decision on the Final Allocation of Funds for Research and Artistic Support*.
- [26] University North. (2020). *Decision on the Final Allocation of Funds for Research and Artistic Support*.
- [27] University North. (2020). *Decision on the Final Allocation of Funds for Research and Artistic Support (Second Call)*.
- [28] University North. (2021). *Decision on the Final Allocation of Funds for Research and Artistic Support*.
- [29] University North. (2022). *Decision on the Final Allocation of Funds for Research and Artistic Support*.
- [30] University North. (2023). *Decision on the Final Allocation of Funds for Research and Artistic Support*.
- [31] University North. (2024). *Decision on the Final Allocation of Funds for Research and Artistic Support*.
- [32] Ministry of Science and Education. (2022). Regulation on Conditions for Election to Scientific Titles. *Official Gazette of the Republic of Croatia*, 28/17, 72/19, 21/21, 111/22.
- [33] Ministry of Science, Education and Sports. (2010). Regulation on Conditions for Election to Artistic-Teaching Titles. *Official Gazette of the Republic of Croatia*, 86/10.
- [34] University North. (2025). *Annual Activities 2024/2025. Varaždin-Koprivnica: University North*.
- [35] Faculty of Economics & Business - University of Zagreb. (2025). *Research Output 2024*. Zagreb: EFZG.
- [36] Heyard, R. & Hottenrott, H. (2021). The value of research funding for knowledge creation and dissemination. *Research Policy*, 50(8), 104288. <https://doi.org/10.1016/j.respol.2021.104288>

- [37] Aagaard, K. (2020). Concentration or dispersal of research funding? *Science and Public Policy*, 47(4), 468-479.
<https://doi.org/10.1093/scipol/scaa008>
- [38] Adda, J., Oliboni, P., & Ottaviani, M. (2023). The impact of research grants on publications and patents across disciplines. *CEPR Discussion Paper*, DP17952.
- [39] Álvarez-Bornstein, B. (2021). Is funding related to higher research impact? *Scientometrics*, 126(7), 5803-5824.
- [40] Nguyen, N. D., Tran, T. T., & Hoang, P. L. (2021). Effects of institutional policies and characteristics on research productivity: A systematic review. *Heliyon*, 7(10), e08123.
<https://doi.org/10.1016/j.heliyon.2021.e08123>
- [41] Matveeva, N. (2021). Effect of Project 5-100 on publication activity and international visibility of Russian universities. *Higher Education in Russia and Beyond*, 4(30), 25-27.
- [42] Ocampo, L. (2022). Research productivity for augmenting the innovation capacity of universities: A systematic review and conceptual framework. *Journal of Open Innovation: Technology, Market, and Complexity*, 8(3), 120.
<https://doi.org/10.3390/joitmc8030120>
- [43] Prancutè, R. (2021). Web of Science (WoS) and Scopus: The titans of bibliographic information in today's academic world. *Publications*, 9(1), 12.
<https://doi.org/10.3390/publications9010012>
- [44] Ding, Y. (2025). Funding and productivity: Does winning grants affect the quantity and quality of publications? *Scientometrics*, 130(2), 789-812.
<https://doi.org/10.1007/s11192-025-05277-3>
- [45] Kwick, M. (2024). Academic productivity and institutional inequality in Europe: The role of internal funding and research policies. *Studies in Higher Education*, 49(5), 889-907.
- [46] Web of Science. Clarivate Analytics.
- [47] Scopus. Elsevier.

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