

# “The third mission of the university in the context of war and post-war recovery”

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### SPECIAL ISSUE: ACADEMIC MANAGEMENT IN THE CONDITIONS OF WAR

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# THE THIRD MISSION OF THE UNIVERSITY IN THE CONTEXT OF WAR AND POST-WAR RECOVERY

## Abstract

In the conditions of the war of Russia against Ukraine, which began on February 24, 2022, Ukrainian universities are playing roles that were not characteristic of them in peacetime. To the greatest extent, this concerns the university's third mission, serving society and responding to its urgent needs. The purpose of this study is to identify and characterize new meaningful directions for implementing the third mission of the university in the conditions of war and post-war reconstruction. The study uses quantitative and qualitative bibliometric analysis combining various methods, in particular, quantitative and dynamic analysis of publications and citations, keyword analysis, cluster analysis and content analysis of publications.

The study's results proved the lack of conceptual studies devoted to the role of universities in the war and post-war reconstruction. The main clusters of implementing the third mission of universities and the existing and potential areas of activity of Ukraine's universities during the war and post-war reconstruction that belong to them were determined. In conclusion, it is substantiated that a new dimension of the mission of universities is being formed, which is at the stage of its formation and needs time for the necessary transformations. Depending on the consequences of the war in Ukraine, it can be a separate cluster of the third mission of universities, and the selection of a new fourth mission of universities, dedicated to peacebuilding and the role of the university during the war and post-war recovery.

## Keywords

third mission, university, bibliometric analysis, war,  
post-war recovery, post-war reconstruction

## JEL Classification

I20, I29

## INTRODUCTION

From a historical point of view, universities were assigned two primary missions after the academic revolution of the 19th century, which is associated with the name of the German scientist and statesman Wilhelm Humboldt (1767–1835): conducting educational and scientific activities (Bongaerts, 2022). In the middle of the 20th century, with the institutional development of universities, another mission was added, which went beyond the first two classical missions and provided additional services to society. So, it became not only about the distribution of established and the creation of new ones (Engwall, 2020). It is about the transfer of knowledge and technologies, professional development, the entrepreneurial activity of universities, participation in the development of local communities in which universities function (Fronzizi et al., 2019). This mission has been called the mission of serving society or the "third mission" of universities (Urdari et al., 2017).

Some scientists more accurately and meaningfully point to the birth and beginning of the development of the third mission of universities, namely after the Second World War (Clark, 1998; Tuunainen & Knuuttila, 2008). At the same time, these scientists, pointing out that after the Second World War, universities took on several new social functions, do not analyze why these changes in the activities of universities took place after the war.

During the war or post-war reconstruction, universities try to fulfill all three missions, but the urgent problems of the society in which a university functions become more significant, since the further development of the university depends on it.

The war in Ukraine proved that most public institutions again needed more time to prepare for such a scenario and had yet to learn of their role during the war. It also applies to universities that still needed a plan for their work in wartime. However, most universities in Ukraine continued their work, fulfilling the main tasks they faced in the pre-war period. The performance of pre-war functions by universities became their front-line task. For example, the current motto of the Sumy State University, located 37 km from the border with Russia, is “Our front is quality education” and “Armed with education, we are approaching victory” (Sumy State University, n.d.).

At the same time, the activity of universities in Ukraine during the first year of the war proved that universities could effectively perform other functions during the war than those peculiar to them in peacetime. Universities actively participate in the war, and their activities can significantly contribute to victory. Universities can also become engines of post-war recovery.

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## 1. LITERATURE REVIEW

The quantitative bibliometric analysis of publications in the Scopus and WoS scientometric databases regarding the third mission of the university demonstrated the growing interest of scientists in this topic during the last two decades (Figure 1). The exception is 2022, where slight reduction to 76 scientific works in Scopus and 44 in Web of Science databases can be observed. However, the level of citations is steadily increasing.

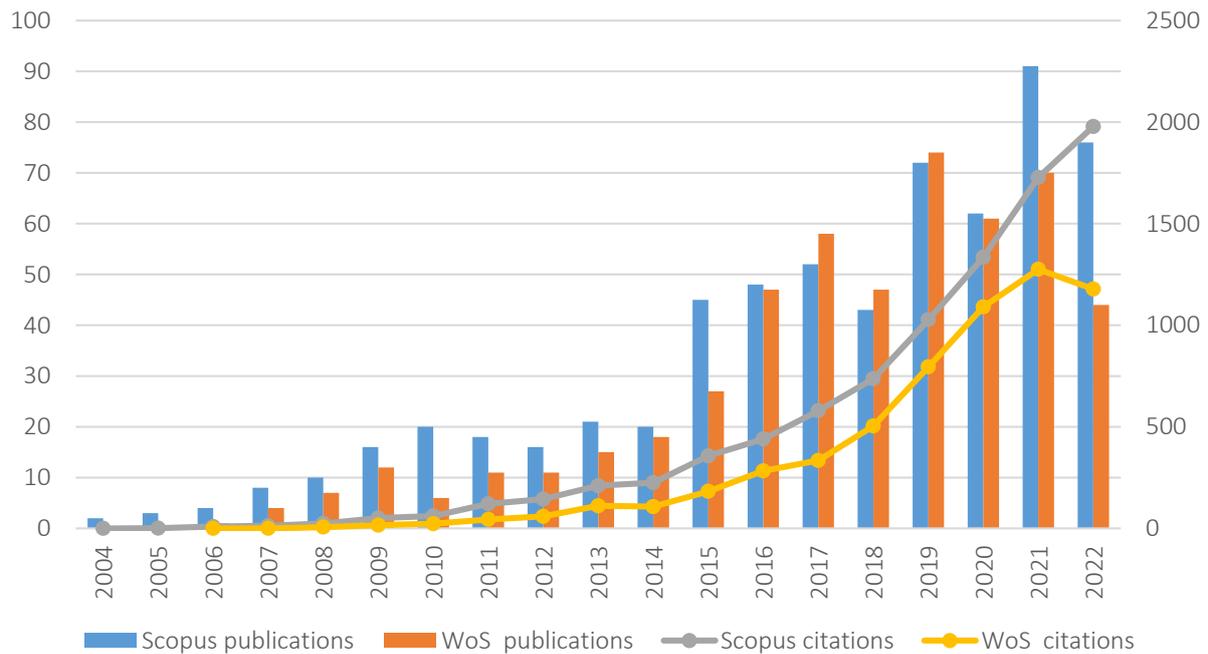
At the same time, a meaningful analysis of these publications allowed identifying only 28 articles that, at least to some extent, analyze the link between the universities' activities and military topics.

Tuunainen and Knuuttila (2008) trace the change in the role of universities after the Second World War (third mission formation) with a focus on the commercialization of activity results. In the same context, Backs et al. (2019) consider academic patenting as one of the manifestations of the third entrepreneurial mission of the university. Lopes et al. (2021) compare the entre-

preneurial intentions of university students before and during the COVID-19 pandemic, and Gomes et al. (2021) – their intentions.

Smith (2013) describes the importance of radio in informing and educating people outside the educational environment, i.e., universities. A historical fact is mentioned, how university teachers conducted educational programs on the radio for 20 years after the Second World War and it is shown as a “cultural” third mission example. Benneworth et al. (2020) consider the need to strengthen the stimulation of social innovation by universities in the context of Quadruple Helix developmental models.

It is also possible to highlight research related to a university's contribution to the protection of human rights, peace and democracy during military conflicts (Abanto et al., 2022), overcoming the consequences of improper use of natural resources and changing landscapes, as well as the formation of environmental security during war (Fallanca, 2019), the impact of higher military educational institutions on the socio-economic status of the region where they are located (Callado-Muñoz et al., 2022).



**Figure 1.** Dynamic analysis of the number of publications and citations on the third mission of a university in Scopus and WoS databases for 2004–2022

The question of the transformation of Ukraine's education system during the war that Russia started against Ukraine in 2022, despite its relative novelty, has already become the object of separate scientific studies. As of February 2023 (a year has passed since the beginning of the war), 15 articles related to the issues of this study have been found in the Scopus database. 12 of these articles belong to Ukrainian authors or their joint publications with foreign colleagues.

The mental and emotional well-being of students and teachers of educational institutions in the conditions of war and steps towards their rehabilitation in the post-war period became the object of research in the works of Meshko et al. (2023) and Kurapov et al. (2023). For this, sociological research methods such as questionnaires and surveys were used. The results showed a significant deterioration in well-being, eating disorders and substance use. In addition, Fiialka (2022) noted a negative impact of the war on the publication activity of scientists and teachers of higher education institutions, the change in the vectors of their research and international cooperation, the deterioration of their psycho-emotional state.

Related to this are studies of the professional and personal potential of teachers and changes in teach-

ing methods, methods and forms, as well as types and styles of communication between teachers and students, which is necessary both at this stage of the war and post-war reconstruction (Ma et al., 2022). One of the essential elements of such changes must be the introduction of critical thinking skills (Rudolph et al., 2022) and the basics of cyber literacy and cyber security (Terepyschyi & Kostenko, 2022) at all stages of learning and teaching.

Kudlińska and Mospan (2022) and Kolesnykova et al. (2022a, 2022b) investigated the features of distance learning and its popularity among students and the European practice of creating and using Open Educational Resources (OER). They indicated the need for further development of modern and high-quality analogues in Ukraine, specifically in the state language. Konovalchuk et al. (2022) evaluated the effectiveness of distance learning in war conditions and identified several difficult moments that require urgent solutions, in particular, limited interactivity and the ability to communicate, unsystematic monitoring, etc.

Among the selected works, there were also national-level works, in particular, on the problems of human capital development of Ukraine in the conditions of war and post-war reconstruction (Kozhyna et al., 2022), optimization of the high-

er education network and adjustment of state procurement in the current conditions (Ponomarenko, 2022), development systems of self-regulation of the quality of higher education (Velychko et al., 2022). In this context, the study by Malykhin et al. (2022) is noteworthy, which contains the results of the analysis of the strategic directions for adapting the education system through a network content analysis of the activities of the Ministry of Education and Culture of Ukraine.

Morrice (2022) claims that in the context of this flow of refugees from Ukraine, an outstanding example of their support through access and offering numerous opportunities in higher education is noted.

These articles mainly analyze specific cases of the impact of war on educational processes, or analyze specific components of the education system, such as the movement of teachers and students and the impact on their psychological state and performance, the forced digitalization of education for the possibility of distance learning, etc. Existing articles still lack understanding of the role of universities during this war. However, it is clear that only a year has passed since the beginning of the war, and researchers need time for analysis, substantiation of conclusions and publications. Therefore, in the coming years, one can expect an increase in publications devoted to the role of universities during the war in Ukraine, including publications indexed in scientometric databases.

Thus, the review of scientific publications proved that the role of universities in the years of war and post-war reconstruction was not sufficiently researched and developed by scientists. At the same time, the war in Ukraine confirmed that the study of this issue is extremely relevant, since universities are direct and active participants in the war, and can also become real and significant players in the post-war reconstruction of the country.

In this study, the goal is to identify and characterize new meaningful directions for the implementation of the third mission of a university in the conditions of war and post-war reconstruction.

## 2. RESEARCH METHODS

This paper uses different instruments to provide a bibliometric analysis of publications devoted to the university's third mission. They include:

- Scopus database and its in-built tools;
- analytical tool SciVal of Elsevier;
- Web of Science (WoS) and its in-built tools;
- VosViewer software (Van Eck & Waltman, 2010).

The following methods were used in the study: quantitative and dynamic analysis of publications and citations, analysis by subject and geography of distribution of scholarly output, keyword analysis, and cluster analysis to create bibliometric maps.

This study is designed in two stages (Table 1), each with specific search queries using logical operators (AND, OR) as of December 2022. In the first stage, publications where the university's third mission was shown in the context of war or post-war recovery were discovered. In the second stage, different dimensions of the university's third mission are analyzed.

The content analysis of the university news sites was also used to analyze the existing experience of implementing the third mission of Ukrainian universities during the first year of the war, in addition to bibliometric analysis.

**Table 1.** Design of the study

Stage	Search query
1. Third mission of the university in the context of war or post-war recovery	(TITLE-ABS-KEY (war)) OR (TITLE-ABS-KEY («post-war reconstruction»)) OR (TITLE-ABS-KEY («post-war recovery»)) OR (TITLE-ABS-KEY (military)) OR (TITLE-ABS-KEY (peacebuilding)) OR (TITLE-ABS-KEY (peacemaking)) OR (TITLE-ABS-KEY (defense)) OR (TITLE-ABS-KEY (resistance))) AND ((TITLE-ABS-KEY (university AND «third role»)) OR (TITLE-ABS-KEY (university AND «third stream»)) OR (TITLE-ABS-KEY (university AND «third mission»)))
2. Third mission of the university dimensions	(TITLE-ABS-KEY (university AND «third role»)) OR (TITLE-ABS-KEY (university AND «third stream»)) OR (TITLE-ABS-KEY (university AND «third mission»))

### 3. RESULTS

#### 3.1. Analysis of meaningful components of the university's third mission

Using bibliometric analysis of publications in the Scopus database, the main subject area of scientific research regarding the third role of the university (Figure 2) was analyzed. The largest share of research concerns social sciences (37%) and business, management and accounting (22%). Other studies have a much smaller share and are devoted to ecological, technological, psychological areas, etc.

The analysis of keywords is the next important element of bibliometric analysis, which forms the main assumptions and vectors of further research. A cloud of keywords using the SciVal database to single out the Top 50 key phrases by relevance based on 469 publications was built (Figure 3).

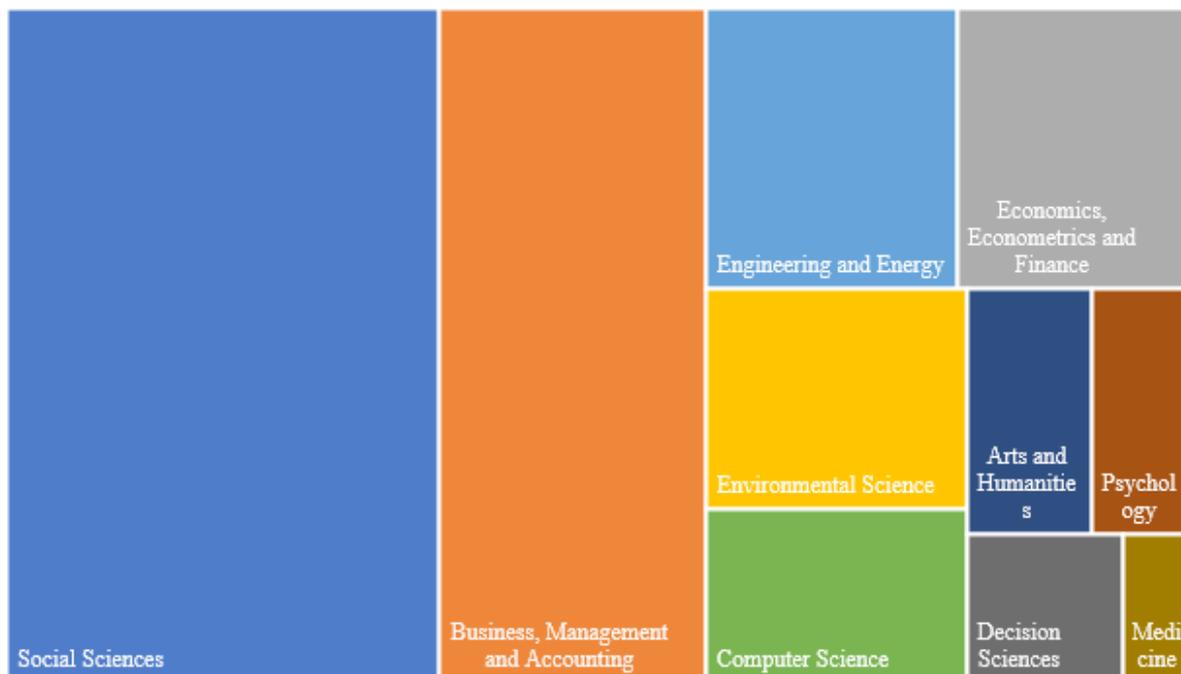
From this cloud, it becomes clear that the words Universities, Mission, Entrepreneurial University, Higher Education Institutions, Higher Education, Knowledge Transfer,

University Sector, and Mission Activity are the most significant topics of the third mission of the university.

The cloud of keywords is a more visual tool that does not allow a deeper look into the nature of research and ranking them according to a certain criterion. Therefore, a cluster bibliographic analysis using the VOSviewer software was carried out. The combined array of input data from the Scopus database was exported to the VOSviewer program and a map of clusters based on the co-occurrence of keywords was constructed. The result can be clearly seen in Figure 4. 12 clusters with 238 items and 3,290 connections were formed, which were grouped and characterized in Table 2.

A cluster analysis of publications of these clusters distinguished 5 main substantive clusters (the roles of the university in society) among all 12 clusters, which characterize certain dimensions of the third mission of universities (Table 3).

A comparison of the scientific works from each of the five clusters, within which the third mission of the university is studied, allowed drawing the following conclusions (Figure 5). Most works study the university as an entrepreneurial structure



**Figure 2.** Analysis of publications on the third role of the university by subject area in the Scopus database for 2004–2022



**Table 2.** Description of clusters of bibliometric analysis on the third mission of the university

Cluster	Description of clusters
Cluster 1 and Cluster 9	<p><b>Transfer of knowledge and technologies (innovations) for economic (1) and social (9) development</b> Items: 29 + 17 Color:  and </p> <p>Typical keywords: knowledge and technology transfer, knowledge society, knowledge management, economic development, research and development, science and technology, industry, innovation policy, university industries, collaboration, university third mission etc.</p>
Cluster 2 and Cluster 3	<p><b>Social (2) and socially responsible (3) role of the university</b> Items: 27 + 27 Color:  and </p> <p>Typical keywords: civil society, corporate social responsibility, empowerment, social (societal) impact, local participation, engaged university, social responsibility, social justice, learning, public good, stakeholders etc.</p>
Cluster 4 and Cluster 11	<p><b>Innovative functions of the university (4) and sustainable development (11)</b> Items: 26 + 11 Color:  and </p> <p>Typical keywords: entrepreneurial education, entrepreneurial university, manufacturing, open innovation, social innovation, co-creation, sustainable development, SDG, technological forecasting, etc.</p>
Cluster 5 and Cluster 10	<p><b>Entrepreneurial role of the university (5) and provision of services (10)</b> Items: 22 + 15 Color:  and </p> <p>Typical keywords: commercialization, economic growth, economic impact, social effect, efficiency measurement, performance assessment, finance, productivity, entrepreneurial intentions, industry collaboration, etc.</p>
Cluster 6 and Cluster 12	<p><b>The impact of the university on ecosystems (6) and regional development (12)</b> Items: 21 + 5 Color:  and </p> <p>Typical keywords: ecosystems, community development, learning city, regional engagement, regional development, regional planning</p>
Cluster 7	<p><b>Lifelong education</b> Items: 19 Color: </p> <p>Typical keywords: continuing education, lifelong learning, intellectual capital, e-learning, engagement, stem, teaching, citizen science, civic education</p>
Cluster 8	<p><b>The political role of the university (the influence of the university on political decision-making)</b> Items: 19 Color: </p> <p>Typical keywords: public policy, resource allocations, research funding, strategic management, business development, commerce, decision making, etc.</p>

**Table 3.** Top-3 most cited publications on the third mission of the university dimensions

Title	Authors	Year	Cites
<b>1. Lifelong education</b>			
An Intellectual Capital framework to measure universities' third mission activities	Secundo, G., Elena Perez, S., Martinaitis, Ž., Leitner, K. H.	2017	106
Reinventing the third mission of higher education in Germany: political frameworks and universities' reactions	Berghaeuser, H., Hoelscher, M.	2020	14
The policy approach for the third mission of universities: The Spanish case (1983–2018)	De La Torre, E. M., Perez-Esparrells, C., Casani, F.	2018	7
<b>2. The social role of the university</b>			
Higher education and its communities: Interconnections, interdependencies and a research agenda	Jongbloed, B., Enders, J., Salerno, C.	2008	478
The Entrepreneurial University: Vision and Metrics	Etzkowitz, H.	2016	73
Universities' third mission and the entrepreneurial university and the challenges they bring to higher education institutions	Rubens, A., Spigarelli, F., Cavicchi, A., Rinaldi, C.	2017	54
<b>3. Entrepreneurial role of the university</b>			
The entrepreneurial university: Examining the underlying academic tensions	Philpott, K., Dooley, L., Oreilly, C., Lupton, G.	2011	299
The nature of academic entrepreneurship in the UK: Widening the focus on entrepreneurial activities.	Abreu, M., Grinevich, V.	2013	268
Reframing the role of Universities in the development of regional innovation systems	Gunasekara, C.	2006	201

**Table 3 (cont.).** Top-3 most cited publications on the third mission of the university dimensions

Title	Authors	Year	Cites
<b>4. Innovative role of the university</b>			
The entrepreneurial university: Examining the underlying academic tensions	Philpott, K., Dooley, L., Oreilly, C., Lupton, G.	2011	299
Beyond the third mission: Exploring the emerging university function of co-creation for sustainability	Trencher, G., Yarime, M., McCormick, K. B., Doll, C. N. H., Kraines, S. B.	2014	251
Convergence or path dependency in policies to foster the creation of university spin-off firms? a comparison of France and the United Kingdom	Mustar, P., Wright, M.	2010	109
<b>5. The political role of the university (leadership, cooperation, influence of the university on political decision-making)</b>			
Does government funding complement or substitute private research funding to universities?	Muscio, A., Quaglione, D., Vallanti, G.	2013	108
Mission impossible? Entrepreneurial universities and peripheral regional innovation systems	Brown, R.	2016	99
Ambiguity and conflict in the development of 'Third Mission' indicators	Molas-Gallart, J., Castro-Martínez, E.	2007	85

(43%) and a source of innovation and leadership (38%). The cluster devoted to the role of the university in the implementation of lifelong education has the smallest share, only 2% of studies.

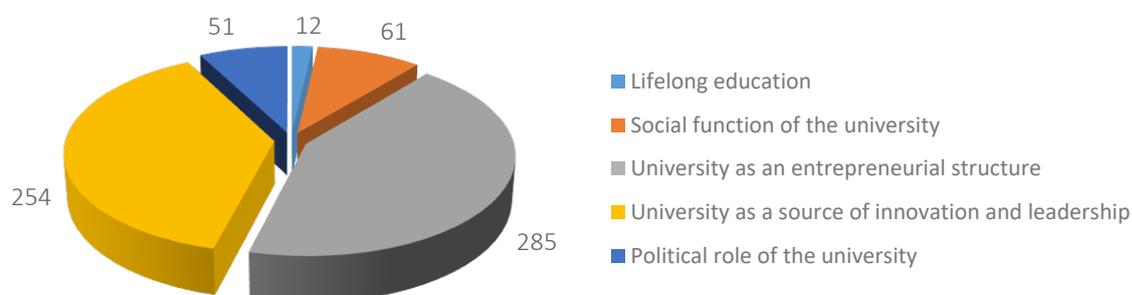
As a result, the bibliometric analysis did not reveal a separate cluster devoted to the security role of the university or the role of the university in the formation of the regional security system, or the role of the university during the war or post-war reconstruction. It was predictable when there were no words related to war or security among the top 50 keywords related to the university's mission.

At the same time, the defined clusters within the third mission of the university allow determining the directions for implementing the third mission of the university during the war and post-war reconstruction within the framework of management structures and adjusted activity processes already established in universities.

### 3.2. Directions for implementing the third mission of the university during the war and post-war reconstruction

A context analysis of publications on the websites of 15 Ukrainian universities leading the university rating "TOP-200 Ukraine" and five relocated Ukrainian universities is conducted to analyze the existing areas of Ukrainian universities' activities during the war, not typical for them in peacetime. The leading Ukrainian mass media publications devoted to this topic are also analyzed.

Summing up the analysis of the actual practice of Ukrainian higher education institutions during the war (analysis of real activity cases presented on higher education websites), in each of the indicated clusters, the following directions of implementation of the third role of universities in the conditions of war and post-war reconstruction can be identified.



**Figure 5.** Percentage distribution of research on the third mission of the university by main content areas

The role of universities in the life-long education cluster can be manifested through educational training and programs of pre-medical assistance, handling of weapons (self-defense) for territorial defense, courses on home energy efficiency, media literacy and cyber security, mine and nuclear safety of the population, etc.

The social role of universities as a second cluster can be manifested by the organization of bomb shelters during air and artillery attacks, volunteering, self-organization of the population, psychological support of the victims, relocation and reintegration of the population, socialization of the military and victims after the war.

Universities, as entrepreneurial structures, can create social enterprises and other entrepreneurial initiatives to ensure military victory and to provide new jobs for people who lost their jobs during the war.

The university's innovative role is closely related to the previous cluster. It can be manifested in the development of innovative military technologies and organization of production processes, social innovations for practical work in the conditions of war and post-war recovery, in particular, to preserve the scientific and pedagogical potential of universities.

The last cluster regarding the political role of universities deserves special attention. Its implementing areas can include the creation of a think tank to organize territorial security and defense of the post-war reconstruction of local communities, create bases for the training of participants in territorial defense, increasing the organizational capacity of public and volunteer organizations, projects for the post-war future, in particular, education for European integration that is essential for Ukraine in terms of applying for EU membership.

## 4. DISCUSSION

When analyzing publications on the third mission of the university, a natural question arises, why universities did not play an essential role in preventing the war, as well as in the emerging concepts of what universities should do during the war, after the Second World War. Moreover, some scientists point out that after the Second World War, new functions of universities began to emerge, and the concept of the third mission of universities began to develop.

It can be assumed that the activities of Ukrainian universities aimed at bringing victory in the war closer and post-war reconstruction will lead to the intensification of scientific research. Accordingly, this study will be able to form a separate cluster within the third mission of the university.

If the function of the university related to a possible war and post-war reconstruction is considered separately, a new (fourth) mission of universities will be formed. It will prevent war, ensure military security, and prepare for military operations. Whether this separate mission will arise depends on what world order will be formed after the end of the war in Ukraine and how safe this world will be.

One of the tasks of the possible development of this fourth mission of universities should be its practical use, so that universities become institutions that increase the effectiveness of national and regional security systems, contribute to peacebuilding, stop wars, reduce their negative consequences and accelerate post-war recovery.

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## CONCLUSION

This paper deals with the study of scientific articles on the third mission of the university and its role in the war and post-war reconstruction. For this purpose, a bibliometric analysis of publications from Scopus and WoS scientometric databases and content analysis of university news sites were used.

First, existing articles were analyzed within the framework of the search query related to keywords characterizing the role of the university during the war years. The results obtained proved that all articles are conditionally related to this issue and rather reveal certain aspects of the formation of the third mission of universities after the Second World War or their entrepreneurial or innovative aspects of the activity.

There are few articles devoted to the impact of the war in Ukraine on educational processes. They do not analyze the transformation of the university's role during the war and post-war reconstruction.

These results led to the transition to the second stage of research, where existing dimensions of the third mission of universities are investigated. The dynamic analysis testified to the growing trend of publications devoted to the third mission of the university. Most of them are in the field of social and economic sciences. In-depth cluster analysis revealed five main dimensions of the university's third mission, 1. Lifelong education; 2. Social role of the university; 3. Entrepreneurial role of the university; 4. Innovative role of the university; and 5. Political role of the university.

Based on the analysis of the activities of Ukrainian universities in 2022 (analysis of real cases of activity presented on universities' websites and in the Ukrainian mass media), directions for implementing the third role of universities in the conditions of war and post-war reconstruction are determined in each cluster. The identified areas of activity of universities within the framework of the implementation of their third mission in a number of cases became part of their permanent activities in war conditions or an integral part of long-term development plans.

## AUTHOR CONTRIBUTIONS

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Formal analysis: Yuriy Petrushenko.

Investigation: Anna Vorontsova.

Methodology: Anna Vorontsova.

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