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The Code of Conduct for Research Integrity, Governance, and Ethics in Education in the USA, Europe, and Ukraine: Comparative Analysis

Kateryna Shykhnenko* 

Institute of Public Administration and Research in Civil Protection, UKRAINE

Alina Sbruieva 

Sumy State Pedagogical University named after A.S. Makarenko, UKRAINE

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Abstract: The purpose of the study is to identify how the coverage of topics of the Code of Conduct for Research in Education in Ukraine is consistent with the ones from the United States of America (USA) and Europe. Furthermore, the study attempts to explore coherences in the documents so that these could be reviewed and addressed. The study used the methodology for mixed-methods systematic reviews to respond to the first research question and the survey research methodology to respond to the second one. It was identified that the research integrity and ethics terms were not sufficiently covered by the Codes of education and research organisations from Ukraine compared to the Codes from the USA and European Union (EU). It was found that there was a shift from emphasising the role of the researcher (contributor) in the Codes from the USA and EU to drawing the importance of regulatory and legal instruments for the maintenance of research integrity and ethics in Ukraine. The prescriptive wording in the Codes of professional organisations in the USA and EU was given much greater attention than in the Codes of educational and research institutions in Ukraine. The Codes of the educational and research institutions from Ukraine were considered to be tentatively consistent with the relevant ones from the database from the USA, and Europe.

Keywords: *Comparative analysis, research ethics, research governance, research integrity.*

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Introduction

Guiding the professional behaviour of the researchers through the codes of conduct for research integrity, governance, and ethics has been a relevant issue for most professional societies across the key areas of research (Enago Academy, 2021; Osho, 2017; Sanjari et al., 2014). The relevance of that issue is underpinned by the increasing evidence for unethical research behaviour worldwide and in low- and middle-income countries, in particular (Ana et al., 2013; Federal register, 2021; Pappas, 2021). That evidence is related to misconduct in the research procedures, misrepresentation of authorship and research publications, and plagiarism (Engle, 2020; Hesselmann et al., 2017; Stavale et al., 2019). For instance, Ayodele et al. (2017) found that the majority of the journal articles were retracted in knowledge management (72%) for plagiarism (80%). Furthermore, 68% of those retracted articles were from China. The above suggests that the dissemination of best practices for tackling allegations and violations of research integrity to reach consistency within the international scientific community in the USA, Europe, and Ukraine seems to be a relevant issue and a research gap. The use of these practices can help cope with the scientific, social, and economic impacts of these research allegations and violations (Stavale et al., 2019).

Literature Review

The study found a number of definitions of “research integrity”, “research governance”, and “research ethics” varying in different countries and different research areas (Ana et al., 2013). In general, “research integrity” is defined as researchers’ compliance with lawful and ethical behaviour practices of the design, conduct, and publication of research so that those practices ensure reliable results of the research (Novaes et al., 2018). The “research governance” refers to a decision-making model of academic research management that involves internal and external university stakeholders and is aimed at both boosting high-quality research and minimising the impact of research misconduct problems

* **Corresponding author:**

Kateryna Shykhnenko, Institute of Public Administration and Research in Civil Protection, SESU, Kyiv, Ukraine. ✉ shikhkate@gmail.com

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(Panigrahi et al., 2017). “Research ethics” is interpreted as expected researchers’ behaviours that attempt to prevent any kind of fraud and mistrust in research (Wagle, 2020).

The literature review found that research integrity, research governance, and research ethics are supposed to set the research standards of research conduct, management, and presentation (Dahlberg & McCaig, 2010). The purpose of setting those standards is to eliminate the issues related to scientific misconduct and authorship which are leading to the retractions of scientific articles and are becoming a threat to the reputation of science (Mandal et al., 2015). Research integrity, governance, and ethics in the USA are ensured by nine agencies whose role is to share information about the policies in research integrity and ethics, control the implementation of those policies, and monitor the processes related to that implementation (United States Government Accountability Office, 2019). Research integrity, governance, and ethics in Europe are promoted using the European Code of Conduct for Research Integrity which serves as a framework and a reference document for the European research community (All European Academies, 2017). Research integrity, governance, and ethics in Ukraine are regulated by the Law of Ukraine “On Higher Education,” the Law of Ukraine “On Research and Development Activities,” the Law of Ukraine “On Copyright and Related Rights,” Regulations and Orders of the Ministry of Education and Science of Ukraine (Ministry of Education and Science of Ukraine, 2020; On Copyright and Related Rights, 2022; On Higher Education, 2022).

The study of terminology which was used in the Professional Codes of Ethics of different research-related professional organisations from nine countries, including the USA, UK, and EU (Spain), found that those documents did not fully address research misconducts and violations. The worrying fact was that only 23% of 795 organisations under study had research integrity and ethics codes that covered from 2 to 3 important terms per organisation (Komić et al., 2015). Sulima and Dienizhna (2020) discovered that regulation, monitoring, and controlling of the scientific activity in Ukraine were still inefficient. Their anonymous survey showed that 80% of the respondents confessed that they committed recycle plagiarism, and 66% of the university instructors submitted ghost-written articles. Those scientists also concluded that there was a need for adjusting the research integrity and ethics policies used in Ukraine so that they were consistent with the best practices of the educational institutions in the USA and EU. Therefore, the *purpose* of the study is to identify how the coverage of topics of the Code of Conduct for Research in Education in Ukraine is consistent with the ones in the USA, and Europe. Furthermore, it attempts to explore coherences in the documents so that these could be reviewed and addressed.

The study sought to answer the research questions which were as follows:

1. What research integrity and ethics terms are covered by the Codes of Conduct for Research Integrity, Governance, and Ethics in Ukraine?
2. To what extent those Codes from institutions from Ukraine are consistent with the relevant ones from the USA, and Europe as perceived by experts?

Methodology

The study used the methodology for mixed-methods systematic reviews to respond to the first research question and the survey research methodology to respond to the second one. These were found the most appropriate because these methodologies are recommended for studies with research questions that are overlapping or complementary (Glasow, 2005; Stern et al., 2020). Having regarded the latter, each research question required a different research design. Both designs relied on the use of the database of Codes of Conduct for Research Integrity, Governance, and Ethics collected from leading universities and research institutions in Ukraine.

The variables for the first phase of the study were the percentage of statements that included the term and the percentage of statements of prescriptive purpose with the term. These variables, which expressed the proportions of the below terms in the corpus of the Codes from Ukraine, the US, and EU, were compared to address the first research question. Twenty-eight concepts on research integrity, governance, and ethics specified by Komić et al. (2015) were revised by 4 volunteer researchers with Doctorate and Ph.D. degrees. The terms were categorised into four groups such as Responsible Conduct of Research (RCR), Questionable Research Practice (QRP), Research Misconduct (RM), and Research Governance Malpractice (RGM). The RCR group of terms included seven terms which were as follows: ‘authorship’, ‘contributorship’, ‘honesty’, ‘ethics’, ‘responsible conduct of research’, ‘integrity’, and ‘credit’. The QRP category consisted of eight terms such as ‘questionable research practices’, ‘questionable publication practices’, ‘bias’, ‘inaccuracy’, ‘misrepresentation’, ‘conflict of interest’, ‘competing interest’, ‘dual interest or dual relationship’. The RM group of terms also included eight terms which were as follows: ‘plagiarism’, ‘misconduct’, ‘fraud’, ‘dishonesty’, ‘malpractice’, ‘falsification’, ‘fabrication’, and ‘manipulation’. The RGM category of terms comprised five terms such as ‘applicable legal requirements’, ‘regulatory and institutional requirements’, ‘scientific standards and standards of quality’, ‘safety, privacy, risk management’, and ‘financial management’. The above keywords were searched in the Codes of Academic Integrity, Codes of Conduct for Research Integrity, Codes of Research Governance Ethics, and Codes of Conduct for Research Integrity and Ethics retrieved from the websites of educational and research institutions in Ukraine (and translated into English) using the Text Analyzer (Webtools, 2022). The Text Analyzer was used to calculate the term frequencies in percentage. The reason

for using values for term frequencies in percentage was the fact that it made it easier and more illustrative to compare the different numeric volumes of data.

Eleven Codes of Academic Integrity, Codes of Conduct for Research Integrity, Codes of Research Governance Ethics, and Codes of Conduct for Research Integrity and Ethics were randomly retrieved from the websites of 11 educational and research institutions. These organisations were as follows: the National Agency for Quality Assurance in Higher Education (National Agency for Quality Assurance in Higher Education, 2019), the Institute of Public Administration and Research in Civil Protection (State Emergency Service of Ukraine, 2020), the Institute of Molecular Biology and Genetics of the National Academy of Sciences of Ukraine (Institute of Molecular Biology and Genetics, 2019), Pavlo Tychyna Uman State Pedagogical University (Pavlo Tychyna Uman State Pedagogical University, 2021), Taras Shevchenko National University of Kyiv (Taras Shevchenko National University, 2017), Cherkasy State Technological University (Cherkasy State Technological University, 2019), National University of Ostroh Academy (National University of Ostroh Academy, 2017), Izmail State University of Humanities (Izmail State University of Humanities, 2017), Chernihiv Polytechnic National University (Chernihiv Polytechnic National University, 2020), Zhytomyr Polytechnic State University (Zhytomyr Polytechnic State University, 2020), and Yaroslav Mudryi National Law University (Yaroslav Mudryi National Law University, 2021). The above documents were translated from Ukrainian into English using the Trados Studio, CAT tool (TRADOS GmbH, 2014). This number of Codes was found to provide sufficient data for the analysis because the content and concepts those documents cover were found virtually the same in most institutions. To address the second research question, the KPMG's Integrity Thermometer Tool was adapted, adjusted, and translated into Ukrainian (KPMG forensic, 2013). The survey was administered in universities and research institutions in Ukraine.

Sampling

A random sampling technique was used in the survey research to involve 343 individual contributors (article authors, co-authors), scientific supervisors, mid-level education and/or research managers, and senior-level education (research managers) from Ukraine. The demographic characteristics of the sample are presented in Table 1.

Table 1. Demographic Characteristics of the Sample (n=343)

Characteristics	N	%
Contributors	266	77.55
Scientific supervisors	38	11.07
Mid-level education and/or research managers	22	6.42
Senior-level education (research managers)	17	4.96

Ethical Considerations

Before taking the survey, all sampled individuals were informed about the purpose of the study, and provision their permission to use the information they provided for the study purposes. They were ensured that the responses would be kept confidential.

Instruments

The study used a researcher-designed questionnaire such as the Integrity, Governance, and Ethics Thermometer Tool (IGETT). The IGETT consisted of 28 questions that covered 4 domains such as "Responsible conduct of research," "Questionable research practice," "Research misconduct," and "Research governance malpractice." It relied on a 7-point Likert Knowledge of Action Scale with 1 meaning 'Never true', 2 - 'Rarely true', 3 - 'Sometimes but infrequently true', 4 - 'Neutral', 5 - 'Sometimes true', 6 - 'Usually true', 7 - 'Always true'. The draft of the survey questionnaire was validated by 8 experts with Ph.D. and Doctorate degrees. Three experts were experienced in peer-reviewing of SCOPUS manuscripts, 1 expert was a journal editor, 2 experts were involved in research management, 1 expert was a psychometrician, and 1 expert was a journal proofreader. The experts were supposed to establish a survey questionnaire's face and content validity. When identifying the face validity of a questionnaire, the experts found the wording and clarity of the items appropriate. Then, the content validity was administered through the calculation of the item-level content validity index (IL-CVI). It was 0.852 which meant 'good content validity' (Polit & Beck, 2006). Five of the above experts also rated the relevance of questionnaire items using the 4-point relevance scale with 1 meaning 'not relevant to the measured domain,' 2 - 'somewhat relevant to the measured domain,' 3 - 'quite relevant to the measured domain,' and 4 - 'highly relevant to the measured domain.' This was followed by the calculation of the Fleiss' Kappa coefficient. The value was 0.583 which meant 'moderate agreement' among the experts on the relevance and appropriateness of the questionnaire items. The questionnaire was administered online to 343 individual contributors (article authors, co-authors), scientific supervisors, mid-level education and/or research managers, and senior-level education (research managers) from Ukraine. The Descriptives test was used to analyse the data yielded from the survey. Jamovi computer software (Version 2.2.5) was used to process those data. (Jamovi, 2022).

Data Analyses

The quantitative data were drawn from both the systematic review and the survey. The systematic review relied on the Text Analyzer to analyse texts of the Codes of Conduct for Research Integrity, Governance, and Ethics from Ukrainian institutions (Webtools, 2022). Trados Studio, CAT tool, was used to perform machine translation of the collected Codes of Integrity, Codes of Research Governance Ethics, and Codes of Conduct for Research Integrity and Ethics from Ukrainian into English so that these could be adequately compared (TRADOS GmbH, 2014). The survey used the Integrity, Governance, and Ethics Thermometer Tool (IGETT) to obtain descriptive data on the experts' view of the extent of the consistency of the Codes from institutions from Ukraine with the relevant ones from the institutions from the USA and Europe.

Results

The results of the study showed that there was a difference in covering the research integrity and ethics terms between the Codes of Conduct for Research Integrity, Governance, and Ethics in the USA and EU, and Ukraine. It was also found that the Codes of educational and research institutions in Ukraine were insufficiently consistent with the relevant ones from the database from the USA, and Europe as perceived by experts.

Results of the Comparative Analysis of the Research Integrity, Governance and Ethics Terms

The comparative analysis used the synonyms for some terms provided in Table 1 in the columns under the Komić et al. (2015). This was because the Codes of educational and research organisations in Ukraine used a wider range of terms in the Ukrainian language. Those options of synonymic pairs were as follows: fraud - deception; malpractice - malicious activity; misconduct - malicious activity; malpractice - depravation; authorship or contributorship - copyright; malpractice - harm; misrepresentation - theft; manipulation - misconception; questionable - unacceptable; honesty - faith; inaccuracy - misconceptions.

Table 2. Frequencies of the Specified Terms Used in Codes of Educational and Research Organisations from the USA, Europe, and Ukraine

Domain /category	Term	According to Komić et al., 2015 (USA & Europe)		Database of the Codes of professional organisations in Ukraine		
		% of statements that included the term	% of statements of prescriptive purpose with the term	% of statements that included the term	% of statements of prescriptive purpose with the term	
RCR	authorship	9.81	63.00	4.20	44.15	
	contributorship	12.45	64.00	5.05	22.00	
	honesty	6.03	65.00	3.21	41.06	
	ethics	14.21	60.00	7.83	47.23	
	responsible conduct of research	0.37	0.4	0.43	0.6	
	integrity	10.31	42.00	6.15	32.11	
	credit	10.18	77.00	2.07	39.00	
	questionable research practices	0.1	0.1	0.02	0.07	
QRP	questionable publication practices	1.38	1.00	1.03	0.61	
	bias	7.04	45.00	3.06	31.13	
	inaccuracy	14.08	70.00	3.06	36.00	
	misrepresentation	5.15	68.00	1.01	43.00	
	conflict of interest	9.05	61.00	3.04	36.21	
	competing interest	0.5	0.5	0.00	0.00	
	dual interest or dual relationship	0.75	0.8	0.00	0.00	
	RM	plagiarism	9.30	72.00	6.38	39.31
		misconduct	6.91	53.00	4.01	41.12
fraud		4.65	51.00	2.11	26.17	
dishonesty		0.88	1.00	0.19	0.52	
malpractice		0.00	0.00	0.03	0.00	
falsification		4.27	71.00	2.08	53.02	
fabrication		3.77	77.00	3.13	48.05	
manipulation		2.01	1.00	1.01	0.91	

Table 2. Continued

Domain /category	Term	According to Komić et al., 2015 (USA & Europe)		Database of the Codes of professional organisations in Ukraine	
		% of statements that included the term	% of statements of prescriptive purpose with the term	% of statements that included the term	% of statements of prescriptive purpose with the term
RGM	applicable legal requirements	0.00	0.00	0.15	0.06
	regulatory and institutional requirements	0.00	0.00	5.56	7.08
	scientific standards and standards of quality	0.00	0.00	0.08	0.12
	safety, privacy, risk management	0.00	0.00	0.00	0.00
	financial management	0.00	0.00	0.05	0.06

As can be seen in Table 2, neither of the Codes from the USA, EU, or Ukraine covers the concept of 'safety, privacy, risk management'. While the Codes of educational and research organisations in Ukraine do not cover the concepts such as 'credit,' 'competing interest,' 'dual interest or dual relationship,' the Codes from USA and EU omit the terms such as 'applicable legal requirements,' 'regulatory and institutional requirements,' 'scientific standards and standards of quality,' and 'financial management.'

Statistically, the eight most frequent terms used in the Codes of professional organisations in the USA and EU were as follows: 'ethics' (14.21%), 'inaccuracy' (14.08%), 'contributorship' (12.45%), 'integrity' (10.31%), 'credit' (10.18%), 'authorship' (9.81%), 'plagiarism' (9.30%) and 'conflict of interest' (9.05%) compared to the frequencies of terms used in the Codes of educational and research institutions in Ukraine such as 'ethics' (7.83%), 'plagiarism' (6.38%), 'integrity' (6.15%), 'regulatory and institutional requirements' (5.56%), 'contributorship' (5.05%), 'authorship' (4.20%), and 'honesty' (3.21%). The values suggest that the density of the terms in the Codes of professional organisations in the USA and EU was higher than of their equivalents in the Codes of educational and research institutions in Ukraine. In the above data, it can be observed the shift from emphasising the role of the researcher (contributor) in the Codes from the USA and EU to drawing the importance of regulatory and legal instruments for the maintenance of the research integrity and ethics in Ukraine.

Concerning the prescriptive purpose of the statements, it becomes evident that the prescriptive wording in the Codes of professional organisations in the USA and EU is given much greater attention than in the Codes of educational and research institutions in Ukraine, regardless of the issues related to the research governance malpractice which is given slight attention.

Results of the Survey based on Integrity, Governance, and Ethics Thermometer Tool

The data drawn from the survey were analysed using the *Jamovi* computer software. The analysis reveals the experts' perception of the comparability of the Codes of integrity from the USA and EU with the Codes of integrity of educational and research organisations from Ukraine. The descriptive statistics for the questionnaire are provided in Table 3.

Table 3. Descriptive Statistics for the Survey Based on the Integrity, Governance, and Ethics Thermometer Tool

	Mean	SE	95% Confidence Interval		SD	Skewness		Kurtosis		Shapiro-Wilk	
			Lower	Upper		Skewness	SE	Kurtosis	SE	W	p
q1	5.00	0.0673	4.87	5.13	1.25	0.16372	0.132	-0.690	0.263	0.918	<.001
q2	4.88	0.0655	4.75	5.01	1.21	0.20980	0.132	-0.390	0.263	0.918	<.001
q3	4.98	0.0675	4.85	5.11	1.25	0.11467	0.132	-0.910	0.263	0.906	<.001
q4	5.00	0.0674	4.87	5.14	1.25	0.00353	0.132	-0.889	0.263	0.918	<.001
q5	5.08	0.0687	4.94	5.21	1.27	0.30297	0.132	-0.456	0.263	0.923	<.001
q6	5.08	0.0691	4.94	5.21	1.28	0.30248	0.132	-0.501	0.263	0.917	<.001
q7	5.11	0.0683	4.97	5.24	1.26	0.15187	0.132	-0.926	0.263	0.908	<.001
q8	4.99	0.0672	4.86	5.13	1.24	0.13528	0.132	-0.707	0.263	0.920	<.001
q9	4.82	0.0657	4.69	4.95	1.22	0.17797	0.132	-0.583	0.263	0.915	<.001
q10	4.81	0.0659	4.68	4.94	1.22	0.09001	0.132	-0.906	0.263	0.911	<.001
q11	4.85	0.0681	4.71	4.98	1.26	0.18662	0.132	-0.384	0.263	0.928	<.001

Table 3. Continued

	Mean	SE	95% Confidence Interval		SD	Skewness		Kurtosis		Shapiro-Wilk	
			Lower	Upper		Skewness	SE	Kurtosis	SE	W	p
q12	4.92	0.0679	4.79	5.05	1.26	0.05487	0.132	-0.862	0.263	0.918	<.001
q13	4.92	0.0705	4.78	5.06	1.31	0.06973	0.132	-0.900	0.263	0.914	<.001
q14	4.94	0.0663	4.81	5.07	1.23	0.01778	0.132	-0.876	0.263	0.912	<.001
q15	4.86	0.0648	4.73	4.99	1.20	0.10521	0.132	-0.676	0.263	0.919	<.001
q16	4.85	0.0692	4.72	4.99	1.28	0.03838	0.132	-0.855	0.263	0.915	<.001
q17	4.86	0.0704	4.72	5.00	1.30	0.03321	0.132	-0.837	0.263	0.916	<.001
q18	4.97	0.0662	4.84	5.10	1.23	0.12180	0.132	-0.756	0.263	0.920	<.001
q19	4.45	0.0607	4.33	4.57	1.12	0.34601	0.132	-0.558	0.263	0.889	<.001
q20	4.22	0.0626	4.09	4.34	1.16	0.44267	0.132	-0.954	0.263	0.848	<.001
q21	4.51	0.0605	4.39	4.63	1.12	0.08191	0.132	-0.553	0.263	0.901	<.001
q22	4.60	0.0620	4.48	4.72	1.15	0.15577	0.132	-0.357	0.263	0.904	<.001
q23	4.56	0.0661	4.43	4.69	1.22	0.17820	0.132	-0.867	0.263	0.885	<.001
q24	4.73	0.0652	4.60	4.85	1.21	0.01788	0.132	-0.877	0.263	0.908	<.001
q25	4.90	0.0626	4.78	5.03	1.16	0.21879	0.132	-0.760	0.263	0.897	<.001
q26	4.77	0.0664	4.64	4.90	1.23	0.01635	0.132	-0.946	0.263	0.901	<.001
q27	4.57	0.0610	4.45	4.69	1.13	0.14011	0.132	-0.733	0.263	0.896	<.001
q28	4.67	0.0629	4.55	4.79	1.16	0.07381	0.132	-0.743	0.263	0.895	<.001

As can be seen in Table 3, the Mean values for the respondents' judgements - ranging from M=4.22; SD= 0.0626 to M=5.11; SD = 0.0683 - imply that they tentatively and quite unanimously accepted the fact that the Codes of integrity of educational and research organisations from Ukraine address the issues of responsible conduct of research, research misconduct, questionable research practice, and research governance malpractice which make them consistent with the seemingly relevant with Codes of integrity from the USA and EU. Examining the Codes from a different perspective, it becomes clear that education and research organisations in Ukraine suffer from questionable research practice, research misconduct, and research governance malpractice. The mean values also illustrate the fact that even though the researchers in Ukraine are informed about the consequences resulting from the violation of the principles of academic integrity and ethics, it often occurs that they attempt to submit or get the same article published in two different journals (M=4.82; SD=0.0657), use their contacts to bypass the peer review process (M=4.92; SD=0.0679), fabricate or falsify data (M=4.22; SD=0.0626 & M=4.51; SD=0.0605), and plagiarise the ideas and data (M=4.60; SD=0.0620). This implication is proved by the values for Skewness that indicated that the data skewed right to 'Sometimes true,' and 'Usually true' meanings. The values for Kurtosis, which are represented by negative numbers indicate a 'light-tailed' distribution which also illustrates unanimity of the experts' views. The values obtained from the Shapiro-Wilk test did not show evidence of non-normality (W = between 0.914 and 0.948, p-value = <.001). Therefore, the survey based on the Integrity, Governance, and Ethics Thermometer Tool showed that the experts considered the Codes of the educational and research institutions from Ukraine to be tentatively consistent with the relevant ones from the database from the USA, and Europe. The experts also specified the major violations of research integrity, governance, and ethics in Ukraine.

The survey data was also analysed and compared according to participants' demographic characteristics and respondents' job functions. When replying to the questions from the domain of responsible conduct of research, the majority of the respondents who were scientific supervisors, mid-level education and/or research managers, and senior-level education (research managers) and involved in reviewing, managing research, performing editor functions for scientific journals, and proof-reading agreed that the Code of Conduct for Research Integrity, Governance, and Ethics used in our institution is not aimed at restricting the rights of researchers or limiting the opportunities to do any legitimate activity practised by researchers and to operate competitively in that activity. However, contributors who did lecturing/teaching/training just tentatively or partially agreed with this statement. It was also quite surprising that contributors, scientific supervisors, and mid-level education and/or research managers indicated that they suspected that the researchers are engaged in the practice of improper/inaccurate conduct in peer review. As for the domain of questionable research practice, contributors, mid-level education and/or research managers, and senior-level education (research managers) who performed management of research, editorial functions confessed that submitting or getting the same article published in two different journals was a problem. However, scientific supervisors were mostly neutral in their judgements on this issue. Almost all the respondents who performed managerial functions reported that they faced the problem of using senior-level managers' authority to bypass the peer review process. The respondents-managers also indicated the occurrence of difficulties with managing the research project adequately, keeping the balance between a researcher's private interests and their public, fiduciary or professional duties, and keeping the balance between the researcher's authorship interest and their responsibility related to their job functions. When responding to questions under the Research Misconduct domain, the greater part of the surveyed people (about 75%) confessed that there was a problem caused by researchers who fabricated data, plagiarised the ideas and data, and whose

findings were undissemintable. The survey also received a greater proportion of respondents' agreement with the questions from the research governance malpractice domain. They confirmed that there were loopholes in the research regulation practices and policies. They also mostly agreed that financial management in the research needed much revision and upgrade.

Discussion

The study attempted to answer two research questions such as, first, what research integrity and ethics terms were covered by the Codes of Conduct for Research Integrity, Governance, and Ethics in Ukraine, and second, to what extent those Codes were consistent with the relevant ones from the database from the USA, and Europe as perceived by experts. The novelty of the study lies in two domains such as, first, the adoption and use of the approach to analysing the terminology used in the Codes of Conduct for Research Integrity, Governance, and Ethics in Ukraine, and second, the design and application of the Integrity, Governance, and Ethics Thermometer Tool. Rather than being used as a knowledge of action framework, an IGETT may raise awareness of the researchers' and research managers' responsibilities for keeping to the expected research practices and in this way help researchers and research managers gain more understanding and take control over their activities when performing the research.

The study found that neither of the Codes from the USA, EU, or Ukraine covers the concept of 'safety, privacy, risk management'. While the Codes of educational and research organisations in Ukraine do not cover the concepts such as 'credit,' 'competing interest,' 'dual interest or dual relationship,' the Codes from USA and EU omitted the terms such as 'applicable legal requirements,' 'regulatory and institutional requirements,' 'scientific standards and standards of quality,' and 'financial management.' Statistically, the eight most frequent terms used in the Codes of professional organisations in the USA and EU were as follows: 'ethics' (14.21%), 'inaccuracy' (14.08%), 'contributorship' (12.45%), 'integrity' (10.31%), 'credit' (10.18%), 'authorship' (9.81%), 'plagiarism' (9.30%) and 'conflict of interest' (9.05%) compared to the frequencies of terms used in the Codes of educational and research institutions in Ukraine such as 'ethics' (7.83%), 'plagiarism' (6.38%), 'integrity' (6.15%), 'regulatory and institutional requirements' (5.56%), 'contributorship' (5.05%), 'authorship' (4.20%), and 'honesty' (3.21%). The values suggest that the density of the terms in the Codes of professional organisations in the USA and EU was higher than of their equivalents in the Codes of educational and research institutions in Ukraine. In the above data, it could be observed the shift from emphasising the role of the researcher (contributor) in the Codes from the USA and EU to drawing the importance of regulatory and legal instruments for the maintenance of research integrity and ethics in Ukraine. Concerning the prescriptive purpose of the statements, it became evident that the prescriptive wording in the Codes of professional organisations in the USA and EU was given much greater attention than in the Codes of educational and research institutions in Ukraine, regardless of the issues related to the research governance malpractice which is given slight attention. The above findings are in line with Horbach and Halfman (2017) who analysed scientific articles, policy documents and newspaper articles and found that the discourse on research integrity and ethics were perceived differently by scientists and policymakers. Scientists interpreted research integrity as a quality that must be fostered compared to the norm enforcement tone of the discourse found in policy documents and newspapers. The above-discussed low values for the frequencies of the use of the terms in the Codes from institutions in Ukraine contributed to the invitation of Zwart and ter Meulen (2019) to the academic and policy debate. The scientists insisted on paying greater attention to both researcher's responsibility and institutional responsibility. They believed that there was a need for a change in the duties of research managers, and approaches to training in integrity.

The survey based on the Integrity, Governance and Ethics Thermometer Tool showed that the experts considered the Codes of the educational and research institutions from Ukraine to be tentatively consistent with the relevant ones from the database from the USA, and Europe. The experts also specified the major violations of research integrity, governance, and ethics in Ukraine. The above was supported by the Mean values for the respondents' judgements - ranging from $M=4.22$; $SD=0.0626$ to $M=5.11$; $SD=0.0683$ - that implied that they tentatively and quite unanimously accepted the fact that the Codes of the integrity of educational and research organisations from Ukraine address the issues of responsible conduct of research, research misconduct, questionable research practice, and research governance malpractice which make them consistent with the seemingly relevant with Codes of integrity from the USA and EU. Examining the Codes from a different perspective, it became clear that education and research organisations in Ukraine suffer from questionable research practice, research misconduct, and research governance malpractice. The mean values also illustrated the fact that even though the researchers in Ukraine were informed about the consequences resulting from the violation of the principles of academic integrity and ethics, it often occurred that they attempted to submit or get the same article published in two different journals ($M=4.82$; $SD=0.0657$), use their contacts to bypass the peer review process ($M=4.92$; $SD=0.0679$), fabricate or falsify data ($M=4.22$; $SD=0.0626$ & $M=4.51$; $SD=0.0605$), and plagiarise the ideas and data ($M=4.60$; $SD=0.0620$). This implication was proved by the values for Skewness that indicated that the data skewed right to 'Sometimes true,' and 'Usually true' meanings. The values for Kurtosis, which were represented by negative numbers indicated a 'light tailed' distribution which also illustrates unanimity of the experts' views. The values obtained from the Shapiro-Wilk test did not show evidence of non-normality ($W =$ between 0.914 and 0.948, p -value = $<.001$). The possible reasons for the results drawn from the analyses of the Codes of Conduct for Research Integrity, Governance, and Ethics seemed to lack an academic culture of learning in higher educational institutions in Ukraine

(Sorokina et al., 2017). Furthermore, there is a substantial loophole in Ukrainian legislation, specifically the Constitution, the Code of Administrative Violations, the Civil Code, the Criminal Code, and the law “On Copyright and Related Rights” which do not guarantee the observance of copyright and the protection of intellectual property (Sidlyarenko, 2018).

The study is consistent with the previous research. It aligns with Engle (2020), Hesselmann et al. (2017), and Stavale et al. (2019) who appeal to the research community to take stricter actions to deal with research, governance, and ethics-related violations. The above findings agree with Sulima and Dienizhna (2020) who claim that the quality of education correlates with the quality of the research. For this reason, the quality of the research and the behaviour of the researchers should be given top priority. This study supported Ayodele et al. (2017) and Morawska and Boughton (2022) who found plagiarism in knowledge management the major international research integrity problem. The findings implied that although according to Mandal et al. (2015), the Codes of Conduct for Research Integrity, Governance, and Ethics are estimated to eliminate the issues related to scientific misconduct and authorship, there should be something more than just a document.

Conclusion

The research integrity and ethics terms are not sufficiently covered by the Codes of education and research organisations from Ukraine compared to the Codes from the USA, and EU. Neither Code was found to cover the concept of ‘safety, privacy, risk management’. While the Codes of educational and research organisations in Ukraine did not cover the concepts such as ‘credit,’ ‘competing interest,’ ‘dual interest or dual relationship,’ the Codes from USA and EU omitted the terms such as ‘applicable legal requirements,’ ‘regulatory and institutional requirements,’ ‘scientific standards and standards of quality,’ and ‘financial management.’ The study found a shift from emphasising the role of the researcher (contributor) in the Codes from the USA and EU to drawing the importance of regulatory and legal instruments for the maintenance of research integrity and ethics in Ukraine. The prescriptive wording in the Codes of professional organisations in the USA and EU is given much greater attention than in the Codes of educational and research institutions in Ukraine, regardless of the issues related to research governance malpractice which is given slight attention. The Codes of the educational and research institutions from Ukraine were considered to be tentatively consistent with the relevant ones from the database from the USA, and Europe. It was also found that education and research organisations in Ukraine suffer from questionable research practices, research misconduct, and research governance malpractice. The above implied the Codes of Conduct for Research Integrity, Governance, and Ethics seemed to lack an academic culture of learning in higher educational institutions in Ukraine. It also seemed clear that there was a substantial loophole in Ukrainian legislation which did not guarantee the observance of copyright and the protection of intellectual property.

Recommendations

The study found a number of gaps in coverage of research integrity and ethics terms by the Codes of Conduct for Research Integrity, Governance, and Ethics in Ukraine and consistency of those Codes with the relevant ones from the database from the USA, and Europe as perceived by experts. The above findings would benefit further research including in-depth revision and update of the Codes, the development and reinforcement measures to follow those Codes, and the design and validation of a reliable tool to measure the ethical climate in research organisations. More research is needed in investigating the ways of involvement of the research community in taking actions to deal with research, governance, and ethics-related violations. It would also be useful to capture quantitatively and qualitatively the experiences of the researchers related to the impact the Codes have on the quality of their work and motivation. Further research is needed in identifying how research malpractice issues could be addressed via the information and training campaigns run by the publishers or institutions.

Limitations

The key limitation of the study is that the comparison of the Codes of education and research organisations is based on data drawn from different periods, specifically, it uses the data from 2015 for the USA and EU and the data from 2019-2022 for Ukraine. The use of resources in two languages such as English and Ukrainian can be considered a limitation. The involvement of only the local experts in participation in the survey is likely to be also a limitation.

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Conflicts of Interest

No conflicts of interest of either legal, financial, or commercial nature are claimed or reported by the research team members or involved experts.

Authorship Contribution Statement

Shykhnenko K.: Conceptualization, design, data analysis, writing. Sbrueieva A.: Supervision, critical revision of manuscript, final approval.

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Appendix*Integrity, Governance, and Ethics Thermometer Tool (IGETT)*

By the completion of this survey, you indicate that you provide your consent to participate in this research study entitled "The Code of Conduct for Research Integrity, Governance, and Ethics in the USA, Europe, and Ukraine: Comparative analysis." The purpose of the survey is to identify your perception of the extent to which the Codes of Integrity from Educational and research institutions in Ukraine are consistent with the relevant ones from the database from the USA, and Europe. Herein, you also provide your permission to use the information you provided for study purposes. It is highly recommended that you do not use the corporate computer or computer network of your institution to respond to this survey. You are free to stop at any time if you feel that questions connote an offensive or biased idea. We would be thankful if you were as much sincere as possible when answering the questions.

1) Mark your level of responsibility

- a) Individual Contributor (Article Author), co-author
- b) Scientific Supervisor
- c) Mid-Level Education and/or Research Manager
- d) Senior-Level Education and/or Research Manager
- e) Other

2) Mark your job function

- a) Reviewer
- b) Research Management
- c) Lecturer / Teacher / Trainer
- d) Full-time researcher
- e) Journal Editor
- f) Proof-reader
- g) Other

Domain	#	Question	Likert Knowledge of Action Scale						
			1	2	3	4	5	6	7
Responsible Conduct of Research	1	The authors are informed about the consequences resulting from the violation of the principles of academic integrity and ethics.							
	2	The researchers are responsible for protecting the confidentiality of the participant's personal data and responses.							
	3	Each co-author is expected to be credited in the manuscript which means each co- contributes to the concept of the research and writing of it.							
	4	Researchers are expected to avoid discrediting whether knowingly or negligently, the research profession or loss of public confidence in it.							
	5	Researchers are supposed to criticise other researchers justifiably, using supporting evidence.							
	6	The Code of Conduct for Research Integrity, Governance, and Ethics used in our institution is not aimed at restricting the rights of researchers or limiting the opportunities to do any legitimate activity practised by researchers and to operate competitively in that activity.							
	7	The control of the research compliance with policies and principles of research integrity and ethics is exercised by individuals based on their functions, level of objectivity, competence, authority, and recourses.							
	8	The researchers are engaged in the practice of improper/inaccurate conduct in peer review.							
Questionable Research Practice	9	Submitting or getting the same article published in two different journals.							
	10	The use of irrelevant statistical or other research methods to collect and analyse data and misrepresent the significance of study findings.							
	11	Redistribution of funds from one research project to another.							
	12	Using one's authority to bypass the peer review process.							
	13	Inadequate data preservation or yielded data mismanagement.							
	14	Biased presentation of the results of the study.							
	15	Failure to manage the research project adequately.							
	16	Failure to develop the appropriate research protocol.							
	17	Failure to keep the balance between a researcher's private interests and their public, fiduciary or professional duties.							
	18	Failure to keep the balance between the researcher's authorship interest and their responsibility related to their job function.							
Research Misconduct	19	The researchers are found to fabricate data – creating (inventing) and reporting non-existent data or results.							
	20	The researchers are found to falsify, manipulate the data or omit data.							
	21	The researchers are found to sabotage resulting in deliberate destruction, damage, or obstruction which harms a research project.							
	22	The researchers are found to plagiarise the ideas and data.							
	23	The findings of the research seem to be undiseminatable.							
Research Governance Malpractice	24	The research activity does not adhere to rules, regulations, guidelines, and commonly accepted professional codes or norms.							
	25	Regulatory and institutional requirements do not comply with the legislation and regulations of the Ministry of Education and Science of Ukraine.							
	26	The institutional research governance and management fail to comply with scientific standards and standards of quality established by the Ministry of Education and Science of Ukraine.							
	27	Universities and research institutions fail to comply with safety, privacy, and risk management policies.							
	28	The financial management of universities and research institutions seems to be inefficient.							

Note: 1= Never true; 2=Rarely true; 3=Sometimes but infrequently true; 4=Neutral; 5=Sometimes true; 6=Usually true; 7=Always true.