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MEANS OF INFORMATIONAL AND TECNHOLOGICAL SERVICE FOR INSTRUCTORS' PROFESSIONAL REPUTATION METRICS

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The article presents a content analysis of modern sciences and fields of knowledge such as scientometrics, pedagogical qualimetry, sociometry, bibliometrics, and cybermetrics. It suggests a set of means of informational and tecnhological services – software to organize preparations, tools for communication with consumers of educational services, and tools for educational and scientific project development. The structure of instructors' professional reputation metrics is revealed.

***Key words**: professional reputation metrics, informational and technological service, means of informational and technological service.*

викладач Шпотя Тетяна, Засоби інформаційно-технологічного сервісу професійно-метричного реноме викладачів/ Український державний університет імені Михайла Драгоманова, Україна, Київ

Здійснено контент-аналіз сучасних галузей наук і знань наукометрії, педагогічної кваліметрії, соціометрії, бібліометрії, кіберметрії. Запропоновано укомплектування засобів інформаційно-технологічного сервісу – програмного забезпечення організації підготовки, інструментів комунікації зі споживачами освітніх послуг, інструментів освітнього і наукового проєктування. Розкрито структуру професійно-метричного реноме викладачів.

***Ключові слова**: професійно-метричне реноме, інформаційно-технологічний сервіс, засобиінформаційно-технологічного сервісу.*

General definition of the problem. The scientific problem of forming professional reputation metrics and image, position and allocation, status and reputation of teaching staff is becoming more relevantin connection with establishing the compliance of their qualifications, characteristics and degrees with modern requirements of legal and technical regulations (licensing, accreditation, standardization and certification procedures), qualimetry (control, monitoring, audit, and certification of objects within the quality management system in the field of education, science and innovation theory, subjects and subject-object relations in the field of quality and life safety, professional activities and development based on the principles of anthropocentrism and ecocentrism, academic ethics and integrity), environmetrics (environmental control and supervision, monitoring, management, modeling and forecasting the condition and development of natural and anthropogenically modified systems– socio-ecological, social, biosocial urbosphere, technosphere, agricultural sphere, biosphere and geosphere), sociometry (structure of interpersonal relationships, diagnostics and classification of tendencies and regularities in social processes and phenomena; social monitoring of groups and categories with various background, and their connections within the hierarchy of the society; identification of social roles, projecting personal and group sociograms, social interests, likes and dislikes), scientometrics (assessment and expert evaluation of scientific activity performance and its informational results; infometrics of scientific communication; academic control by publishers and research establishments, statistics on the structure of research works, dynamics, intensity and vectorization of research processes, identification of scientific references and citing, informatization and digitalization of scientific

achievements and heritage, their archiving and bibliography; forming the potential of scientometrics research assets– bibliometrics, cybermetrics, webometrics, altmetrics, politicometrics, media metrics) in the course of self-education and self-management, obtaining qualifications, professional retraining, advanced training, obtaining related and cross qualifications with confirmed competencies and ability to achieve prolonged lifetime employment.

Informational and technological service for HEI instructors' professional reputation metrics is a key service tool and means of arrangement of academic and social assets held by all participants of the educational process in terms of their professional training and development of future teaching elite with high employment prospects.

Previously unexplored aspects. The purpose is to form instructors' professional reputation metrics by means of informational and technological services. The task is to formulate the statement of instructors' professional reputation metrics; perform content analysis of recent research works and publications; suggest a complete set of means of informational and technological servicesto form instructors' professional reputation metrics.

Presentation of the core material. The general definition of the problem provides an overall statement of ‘instructors' professional reputation metrics.’ For the purposes of this work, recent research works and publications in the field of scientometrics and pedagogics – qualimetry, sociometry, scientometrics, bibliometrics, cybermetrics– have been analyzed.Special attention should be paid to additional theoretical justification of the role played by environmetrics, webometrics, altmetrics, politicometrics, media metrics, infometricsand performance of pedagogical survey.

Intensive development of qualimetry as a science of quality encourages researchers to study a new branch of pedagogical qualimetry

and apply it to measure the quality of activities performed by all participants of the educational process in higher education institutions (hereinafter HEIs). Justification and practical recommendations for the need to develop qualimetry methodology for main subjects of the educational process were the focus of research works by A.Topuzyan and N.Markosyan [1].

Goals of the ‘education for all’ policy are highlighted in the works on analyzing the quality of education written by Rehaf A. Madani; World Declaration on Education for All determined support for the all-around right to education through optimal access to improve its quality which is diagnosed in the metrics of indices of government spending, the education applicant to teacher ratio, their qualifications, relevance of teaching and research work, investments in ensuring the quality of well-being and social development programs through improved efficiency of pedagogical activities. The author sees the key problem in establishing a metrics of ideal education quality parameters for a person, institution, field (generally and for every specific country); suggests main tasks for the program to implement the education for all policy: improving infrastructure of the educational environment, solving the problem of teacher and supervisor training programs owing to practically beneficial experience of transforming teachers’ competencies to improve teaching methods, unifying teaching methods to improve self-appraisal and social competency of education applicants, providing educational, information and communication resources to facilitate enhancement of the educational process [2].

Austrian and German scholars emphasized the importance of quality monitoring, particularly monitoring of experience in ESP (Education Service Provider) networks, and established that Education Service Providers ESP play a crucial role in digitalization for education, since they provide both educational media and high-quality Internet access. Application of a full-scale system for monitoring QoE (Quality of Experience) enabled them to

characterize behavior of information and technological means, as well as video content, on the Internet and conduct its quality assessment (in almost 1,000 education centers with 4,000 devices). Deploying a network of education services through education centers revealed a higher quality of providing education as compared to private locations (by places of residence) [3].

To implement effectively the monitoring of education and research quality in the field of higher education, scientists O. 4. Oseredchuk,L. Nikolenko,S. Dolynnyi, N. Ordatii, T. Sytnikand others emphasize the need to apply informational and technological support on the functional platform of developing the monitoring system in cyclic stages – observation, orientation, decision-making and taking action in real-time mode, and access to information for all levels of the hierarchy (with options to block and restrict access). They suggested directions for using the quality monitoring system – effectiveness of research work by results of problem search in scientific, reference and study materials; diagnostics of electronic resources; improvement of education standards; preparation of analytical reports, expert opinions on top-priority issues of education, science and innovation theory; analysis of legal and technical regulation of government and branch (sectoral) programs; studies on results of forums and conferences, abstract and bibliographical publications[4].

Issues of empirical sociometry for providing mutual assistance in study groups and applying sociometry means by social workers and supervisors are covered in the works by S. Giacomucci [5]. In the field of social psychology, sociometry as a scale for diagnostics of relationships and group relations for students and researchers is recommended by L. Soufyane[6]. Development of electronic sociometry programs for consulting management on establishment of social relation structure in groups and social status of each group participant is explored by R.Sh. Anita, S. Derta [7]. They have

suggested a SDLC (System Development Life Cycle) model in stages (communications, planning, modeling, development and deployment). Development and approbation in the educational process of the simulation tool (agent-based simulator, ABS) to model and forecast education applicants' sociograms by psychological indices and in sociometric assets were performed by I. García-Magariño, R. Igual, H. Jamali for planning education strategies of HEI instructors [8]. Improvement and implementation of new methods for presenting a person's sociometric reputation in peer groups (as illustrated by neglected children)were developed by P.R. Kulawiak, J. Wilbert [9].

Systemic research of sociometry was conducted by scientists in various fields of knowledge: in the last decade, statistical methods to analyze sociometric potential of pedagogical universities were applied by K. Akbash, N. Pasichnyk, R. Rizhniak in order to perform diagnostics of humanitarian, pedagogical and interdisciplinary publications as regards improvement of institutional h-index by profiles in Scopus and Web of Science scientometric databases [10]. Scientometric assessment as V. Bykov's academic school in the field of education, science and innovation theory is developed by his followers [11] to apply the metrics of indices to establish effectiveness of pedagogical research in scientific institutions and education establishments. Development and application of information-digital technologies to improve research efficiency assessment methodology and apply scientometric methodology parameters in pedagogical research, as well as to perform expert assessment of scientometric potential of an institution were explored by T. Vakaliuk, O. Spirin, I. Mintii, S. Ivanova and others [12, 13, 14]. Scientometrics as a process of infromatization of science for the purposes of exploring science is studied by S. López-Pernas , M. Sakr and M. Apiola [15], who actualize the need for scientific mapping of academic obligations assigned to scholars, teachers, politics and education applicants, which is

related to increasing social requirements for productivity of science and presentation of its results in numerous sources - publications, databases, archives and library stocks, and is also regulated by time constraints for those exploring the use of academic assets; the authors conceptualize the role of scientometrics in representing and assessing effectiveness of research work and research output produced by scientists or institutions, and in improving the work of the academic community; scientists recognize scientometrics as a quantitative interdisciplinary method of scientific cognition for science in general and scientific communications in particular; they distinguish a direction in bibliometrics to digitalize library stock, and focus on prospective development of epistemology to explore architectonics, semantics and further development of various branches of knowledge.

Scientometric studies concerning processes of substantiating the application of online learning platforms for STEM (Science, Technology, Engineering and Mathematics) education with the use of A/B testing involving digital texts in order to select the best version of a piece of information and to perform learning analytics (LA) were conducted by R. S. Baker, N. Nasiar, W. Gong, Ch. Porter [16]. Practical application of scientometric analytics in the late 1970s – early 2020s was suggested by S. Rashid, S. U. Rehman, M.Ashiq, A.Khattak [17] as a social service of education; the authors implemented a scientific metrics (by software means ofMS Excel, VOS Viewer, Biblioshiny, CiteSpace and ScientoPy) of priorities and tendencies in research activity based on published research works and citation assets of authors and co-authors, as well as their bibliography with the purpose of discovering an optimal model of productivity in the field of social support for education the need for which is related to the intensity of inclusion, education for adults, and the variety of education applicant backgrounds at different levels and stages of personnel training.

Key factors influencing the scientometric status of Ukraine's HEIs according to publication asset rating of their teaching staff were explored by K. Akbash, N. Pasichnyk, R. Rizhniak [18] in order to establish, by means of variance analysis and regression analysis, the extent of influence of scientometric potential on productivity of research work (the influence of the number of citations and published articles on a scientist / instructor) and HEI's academic reputation (by institution specialization and number of academic staff); actualized the importance of implementing HEI rating with the use of operative (top-priority) and accumulative assets of research work, with consideration of HEI specialization semantics through weighted arrangement of coefficients (indices of influencing factors).

Bibliographic studies of research activities in the field of human-computer interaction were conducted by F.E. Sandnes; the scientist concluded that bibliometric archives simplify the process of comparing competitiveness of scientists at the stage of employment and formation of the personnel reserve for further career development, as well as the process of confirming candidates' suitability for offices and distributing financial support, which is reflected in their research achievements Franceschet, 2010; Haugen & Sandnes, 2016; Sandnes, 2018 [19].

Strategies of HEI cybermetric representation were studied by G. Ye. Annum and it was established that according to the Webometrics global rating [20] and on the initiativeof Cybermetrics Lab, by key content of leading rating agencies set as Visibility, Transparency and Excellence, the triad of stratagems are suggested – implementing Problem-based Learning (PBL) systems, facilitating development of network-based electronic forms of learning, encouraging development of institutional repositories providing free access to academic assets and thus ensuring practically beneficial exchange of latest scientific, technological and cultural knowledge accumulated by founders and followers of HEI academic schools [21].

Generation and actualization of latest approaches to applied cybersecurity and privacy, the need to develop a security system, deployment of web credentials encryptionand education are the topics covered in the monograph by Rodrigo and Natasha Ruiz; the priorities include privacy (InPrivate, incognito mode) and the right to personal security, personal data protection, consequences of cyberthreats, and civic freedoms according to General Data Protection Regulation, GDPR; Regulation (EU) 2016/679) [22],exploring cryptographic systems for accessing encrypted data of potentially criminal assets, establishing credentials dispositions with access to locations, running web credentials biometrics when performing critical operations in intranetworks, electronic commerce procedures, home banking and mailboxes, optimizing activities of social services, protecting information systems from malware and improving methods of forming cybersecurity, analyzing potential risks of autoimmune diseases and scenarios of their scaling with forecasts as regards theirpossible application for military purposes, studying the human factor in cybersecurity issues; it is accentuated that university education plays a key role in prospects of academic discourse which is currently almost separated from social practice in terms of education for cybersecurity (lack of portable education programs, teaching the classification of relevant cybersecurity issues, especially in IT classification by IRCS (Index of Relevance in Cybersecurity), methodological content of courses, cyber technologies and processes, as well as spaces for application of practical solutions for complicated and practice-related problems related to government strategies for the armed forces and cybersecurity specialists in scenarios of military strategies to organize a safe cyber space through innovative approaches in the field of education and science [23].

It is suggested to complement the informational and technological service of forming HEI instructors' professional reputation metrics in the following functional segments:

– software course management system - Moodle (https://moodle.org), Talent (https://www.talentlms.com), Lessonly (https://www.lessonly.com), Easygenerator (https://www.easygenerator.com/), iSpring e-learning managament software (https://www.ispringsolutions.com), LearningStone (https://www.learningstone.com) - cloud-based; platforms like Litmos (https://www.litmos.com), Teachable (https://teachable.com), Gomo learning (https://www.gomolearning.com/); system environments for management of open online interactive learning and design courses Easy (https://www.easylms.com), NEO (https://www.neolms.com/), Canvas (https://www.canvas.net/);

– tools for communication with educational service consumers (Kahoot ! (https://kahoot.com/), Socrative (https://www.socrative.com/), Wooclap (https://www.wooclap.com/), Google sites (https://sites.google.com/new) WIX (https://uk.wix.com/) individual assessment rooms, virtual educational environment, web constructors; course development and exchange, using an online learningmonitoring system ArticulateRise 360 (https://articulate.com/360/rise), Articulate 360 (https://articulate.com/360/storyline); designing andmodeling educational multimedia visual and video resources – platforms like Powtoon (https://www.powtoon.com/), Moovly (https://www.moovly.com/) for video and multimedia content, Camtasia (https://camtasia.en.softonic.com), Vyond (https://www.vyond.com/) video editors, PlayPosit (https://go.playposit.com/) learning management platform; educational services for presentation development Prezi (https://prezi.com), Powerpoint (https://office.live.com), Google presentations (https://www.google.com), Keynote (https://www.apple.com/ru/keynote/), cloud-based support for joint

communications in video conferencing VoiceThread (https://voicethread.com/), audio editor, digitization of soundtracks with edited sound effects Audacity (https://www.audacityteam.org/);

– tools for educational and research planning, as well as teamwork planning in Google research and author groups: G Suite for Education (edu.google.com/products/gsuite-for-education) ensuring educational process and preserving educational resource assets, Kaggle (https://www.kaggle.com/) organizing storage of scientific data with a search system and communication for its prospective use; corporate document management Colaboratory (https://colab.research.google.com), Notion (https://www.notion.so/); infographics constructors with software support for visualization and creative project design Confluence (https://www.confluence.com/), Miro (https://miro.com), Adobe Photoshop (https://www.adobe.com/ua/), Piktochart (https://piktochart.com/), Draw.io (https://drawar.io/),Infogram (https://infogram.com/);

– software products for project work Trello (https://trello.com/uk); corporate project activities – Asana (https://asana.com), virtual teamwork consumer synchronization MicrosoftTeams (https://www.microsoft.com/uk-ua/microsoft-365/microsoft-teams/free); information and communication activities in project development Pyrus (https://pyrus.com/ru); network platform for associations of educational centersTrainingSpace (https://www.trainingspace.online/), IT business platform for education and science Granatum Solutions (https://granatum.solutions/) [24].

Conclusions. The statement of HEI instructors' professional reputation metrics has been formulated; the content analysis of recent research works and publications has been performed; a complete set of means of informational and technological services to confirm compliance of HEI instructors' professional reputation metrics has been suggested.

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