Digital transformation of professions in physical education and sport sector

UDC 796.011.3

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Abstract

Objective of the study was to reveal the trends of transformation of tracks of the professional physical education and sports specialist training system in the context of the ongoing economic digitalization process and data-driven management approach of the physical education and sports experts.

Methods and structure of the study. We made a content analysis of 135,000 documents (including study reports and corporate sports management vacancies in Europe, North and South America) to rank requirements to the competences and job responsibilities in special digital services of the modern physical education and sport sector service personnel.

Results and conclusion. On the whole, the global physical education and sport sectors show a special demand for personnel having digital competences and, therefore, we recommend the national physical education and sport sector decision-makers to give a special priority to the following education disciplines: "SMM in sports", "Customer Relationship Management incorporate sports", "Digital Marketing in Sports", "Artificial Intelligence in physical education and sports", "Digital technologies in sports"; ; plus the following special modules: "Data analysis in sports", "Artificial Intelligence and machine learning in sports", "Digital project management in sports", "Big Data with artificial Intelligence technologies", etc.

Keywords: *digitalization, digital economic competences, sports, physical education, digital trail, referee, coach, sports agent, corporate sports manager.*

Background. The physical education and sport sector digitalization ideas were advanced by the leading researchers since the mid-XX century [4]. Modern research community analyzes the ongoing physical education and sport sector transformations in the context of the digital economy growth trends [1,2, 3, 5-7]; although the physical education and sport specialist training system transformations are still largely underexplored.

Objective of the study was to analyze the professional physical education and sport specialist training system and its transformation tracks in the context of the ongoing economic digitalization process and growing management data-driven styles in the physical education and sport sector progress policies and practices.

Methods and structure of the study. We run the study in 2019-2021 in three stages:

– Contribution to the development of the physical education and sport specialist professional competency qualification toolkit;

– Analysis of the physical education and sport specialist labor markets and demand formation logics with a special attention to the data-driven operation competences; and

– Contribution to three professional physical education and sport specialist training curricula digitalization project development, implementation and progress analyses under the "Digital economy Personnel Training for the National digital economy" Federal Program.

Results and discussion. Having analyzed the physical education and sports labor market demands in many countries, we found the key professional physical education and sport specialist training service progress trends to make recommendations for

Table 1. *Digital transformations in competencies of the physical education and sport specialists*

Specialty	Digital competencies
Sports referee	Sports ref's responsibilities are to: ensure compliance of the rules, fix sports results, violations of the rules, accept appeals, etc.; with the ongoing digitalization of the service requiring proficiency in special software and technical tools. Modern ref's services are classified into the offline and online ones. The offline service may require the relevant equipment test, setup and operation competences and potential assistance including the modern communication tools operation ones to deal with the competitors and supporters. The online ref service requires a high proficiency in special technologies and excellent communication toolkit operation skills. Modern digital technologies (including those with the artificial Intelligence elements) may require a ref being reasonably proficient in the operational software administration domain critical for the sports refereeing service quality.
Coach	Modern coaches are increasingly expected to demonstrate proficiency in the data processing on the whole and big data processing formats in particular – starting from the input data collection and processing digital technologies. The digital technologies-competencies are critical for a modern coach to efficiently design and manage the training and competitive service in the offline and online formats. The offline training and competitive service requires the coach to freely use special technical tools and technologies to monitor and test the individual performances and teamwork in every technical and tactical aspect. The online coaching service requires the coach being proficient in the performance data collection, processing and management, and in the trainees training in the own performance self-test basics; plus competent in the modern safety standards secured by efficient digital visualization and communication tools. A digital-technologies-competent coach, therefore, should have due analytical skills, due to separation of the analytical and coaching responsibilities being often counterproductive. A sports analyst must have some coaching competencies and vice versa otherwise the information on athletes and team and their training/ competitive performance data flow may be fragmented.
Professional athlete	A digital-technologies-proficient athlete is able to freely communicate with their coaches in offline and online formats, particularly in professional sports where they need to timely test and manage the physical fitness and performance in combined/ hybrid competitive formats – for the best competitive progress, since such progress in professional sports is acknowledged in many aspects including the financial one. This is the reason why the modern digital technologies -competent athlete should give time to his/ her media indexing, social networking, media covering and other commercial aspects. This means that a modern professional athlete should have good digital imaging competencies and skills; although they are often detrimental for high intensive trainings and, hence, may sometimes be outsourced. Still every top athlete is expected to contribute to the digital content building efforts by photos, videos, etc.
Corporate sports manager	Corporate sports manager should be proficient in the management and marketing responsibilities in contact with the relevant government agencies – within the Government Relations domain. Modern digital technologies competences are known to help a corporate sports manager control and optimize the inside service system and build up relations with the outside parties including the potential and current clientele. Of special benefits for the corporate sports manager, therefore, in addition to the general digital economy / cultural ones, are the Customer Relationship Management and other relevant system management skills. The corporate sports management service should give a due priority to social networking. Thus in b2b segment we would prioritize the following digital tools: partner programs, websites, social networks; and in the b2g segment: professional sports advertising in communities and core agencies; website management, radio/ TV advertising. Highly ranked in the b2c segment are the social networking, website management, blogging and thematic communities building elements. (Note: b2g segment is the e-advertizing of professional sports communities and agencies, website management, radio/ TV advertizing; b2c segment is the social networking, website management, blogging and thematic communities building elements. On the whole, modern digital technologies competences help the corporate sports management excel the service by the electronic infrastructure coordination, moderation and networking skills.
Sports agent	The valid legislation allows a sports agent form agency contracts with individual athletes, coaches and professional sports clubs. Modern sports agent may be classified into (1) personal assistants in accommodation, booking and other services; and (2) commercial project managers that advance, among other things, the athletes' media indices. Modern professional sports agents need to be highly proficient in the digital technologies including the smart contracting ones. They increasingly operate as the community managers, with their responsibilities including contacts with the employers, commercial partners, sponsors and advertisers.

the national physical education and sport specialist training system transformations initiatives. Making our contribution to the "Digital economy Personnel Training for the National digital economy" Federal Program in 2020, we developed the following four Digital Professional Training curricula (three of which are implemented as of now): "Digital Marketing in Sports"; "Event Producer (esports)" and "SMM in esports" [8-10]. Our subsequent analysis of the digital progress tracks of the trainees of the above Digital Professional

Training courses found the physical education and sport specialties and Digital technologies competences of highest demand on the labor markets: see Table hereunder.

Conclusion. Our analysis of the professional physical education and sport specialist training system and its transformation tracks in the context of the ongoing economic digitalization process and growing management data-driven styles found the following modern high-demand digital technologies competences in every physical education and sport specialty: service software administration and operation skills (in the sports refereeing, training service, etc.); test digital technologies operation and data processing skills to efficiently manage fitness and performance; and media coverage related digital technologies operation and control skills. Therefore, we would recommend the physical education and sport specialist training curricula being complemented by the following modules/disciplines: "SMM in Sports", "Customer Relationship Management in sports organization", "Digital Marketing in Sports", "Artificial Intelligence in physical education and sports", "Digital technologies in Sports"; plus the following special modules: "Data analysis in sports", "Artificial Intelligence and machine learning in sports", "Digital project management in sports", "Big Data with artificial Intelligence technologies", etc.

References

1. Gorbachenko A.F., Skarzhinskaya E.N. Professions of future: computer sports as industry of information society. Management in the field of science, education and technological development. Proc. research- practical conferences with international participation. 2016. pp. 115–119.

2. Ermakov A.V., Skarzhinskaya E.N. Digital technologies in sports as educational tool. Physical education and sports in the XXI century: Actual problems and their solutions. 2020. pp. 189–193.

3. Ermakov A.V., Skarzhinskaya E.N., Sarafanova E.A. Sports education - big data based pedagogy. Big data in education: data analysis as a basis for making managerial decisions]. Proc. I International Conference. 2020. pp. 313–323.

4. Zatsiorskiy V.M. Cybernetics, mathematics, sports. M.: Fizkultura i sport publ., 1969. 200 p.

5. Iordanskaya F.A. Digital technologies in monitoring of training and distance training processes for athletes and people involved in physical education. Vestnik sportivnoy nauki. 2020. No. 3. pp. 31–44.

6. Kukushkin A.A., Novoselov M.A. Sensory visualizers-applied model of physical fitness rating system for primary school students. Sbornik trudov studentov i molodykh uchenykh RGUFKSMiT. 2014. pp. 70–71.

7. Novoselov M., Filatov S. Specialized software for psychodiagnostics and correction of athletes' functional state. Sportivny psikholog. 2004. No. 1. pp. 87–90.

8. "Event-producer (e-sports)" Program. Available at: https://cat.2035.university/rall/course/6408/?project_id=27&keywords=event menedzher (date of access: 10.06.2021)

9. "SMM in eSports" Program. Available at: https://cat.2035.university/rall/course/6406/?project_id=27&keywords=smm kibersport (date of access: 10.06.2021).

10. "Digital Marketing in Sports" Program. Available at: https://cat.2035.university/rall/course/6492/?project_id=27&keywords=%D1%86%D0%B8%D1%84%D1%80%D0%BE%D0%B2%D0%BE%D0%B9%20%D0%BC%D0%B0%D1%80%D0%BA%D0%B5%D1%82%D0%B8%D0%BD%D0%B3%20%D0%B2%20%D1%81%D0%BF%-D0%BE%D1%80%D1%82%D0%B5 (date of access: 10.06.2021).

11. Bachelor of Arts (BA) Degree with a Major in Sport Management and a Major Concentration in Sport Analytics. Available at: https://ga.rice.edu/programs-study/departments-programs/social-sciences/sport-management/sportmanagement-ba-analytics-concentration/ (date of access: 23.05.2021).

12. Careers in esports: advice and information. Available at: https://britishesports.org/careers (date of access 10.06.2021)

13. Masters Degrees (Sports Analytics) Available at: https://www.findamasters.com/masters-degrees/?Keywords=sports+analytics (date of access: 23.05.2021).

14. Sport Analytics Available at: https://www.syracuse.edu/academics/undergraduate-majors-minors/sportanalytics/ (date of access: 23.05.2021).