



OPEN ACCESS

EDITED BY

Shamsun Nahar,
University of Dhaka, Bangladesh

REVIEWED BY

Johnny Padulo,
University of Milan, Italy
Italo Sannicandro,
University of Foggia, Italy

*CORRESPONDENCE

Giovanni Esposito
✉ gjoesposito@unisa.it

RECEIVED 28 February 2023

ACCEPTED 03 May 2024

PUBLISHED 15 May 2024

CITATION

D'Isanto T, Esposito G, Altavilla G, D'Elia F and Raiola G (2024) Scientific identity and epistemology of movement, exercise, and sport sciences through the analysis of scientific production of Italian full professors. *Front. Educ.* 9:1176632. doi: 10.3389/feduc.2024.1176632

COPYRIGHT

© 2024 D'Isanto, Esposito, Altavilla, D'Elia and Raiola. This is an open-access article distributed under the terms of the [Creative Commons Attribution License \(CC BY\)](https://creativecommons.org/licenses/by/4.0/). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

Scientific identity and epistemology of movement, exercise, and sport sciences through the analysis of scientific production of Italian full professors

Tiziana D'Isanto¹, Giovanni Esposito^{1*}, Gaetano Altavilla²,
Francesca D'Elia¹ and Gaetano Raiola³

¹Department of Human, Philosophical and Education Sciences, University of Salerno, Salerno, Italy,

²Department of Biological and Environmental Science and Technology, University of Salento, Lecce, Italy, ³Department of Physical Activity and Sport Sciences, Pegaso University of Naples, Naples, Italy

This study addresses the epistemological and identity challenges encountered by Movement, Exercise, and Sport Sciences (MEaSS) in Italy, particularly concerning the organization of scientific knowledge within academic contexts. MEaSS struggles to define its scientific identity and address epistemological concerns due to the concurrent operation of its academic scientific disciplines (ASD) within both biomedical and pedagogical domains. This situation raises questions about the classification of knowledge within MEaSS and its distinctiveness within the Italian academic community. The study aims to analyze the scientific production of Italian full professors in two ASDs of MEaSS and determine its relevance to biomedical, pedagogical, psychological, or sports domains. It also intends to investigate the alignment of Italian academic structures with international standards, particularly the European Research Council (ERC) model. Each full professor's top 20 scientific products, ranked by the highest number of citations within the Google Scholar database, were analyzed. The analysis of scientific production among Italian full professors in the two ASDs of Movement, Exercise, and Sport Sciences (MEaSS) revealed significant findings. In the ASD of M-EDF/01, 58.5% of publications were attributed to the biomedical domain, followed by 32.7% in the sports domain, 6.9% in the pedagogical domain, and 1.9% in the psychological domain. For the ASD of M-EDF/02, 47.5% of publications were in the biomedical domain, 25% in the sports domain, 18.1% in the pedagogical domain, and 9.4% in the psychological domain. The prevalence of biomedical-focused research within both ASDs of MEaSS highlights a notable deviation from the intended disciplinary boundaries, raising concerns regarding the loss of scientific identity and epistemological coherence. These results emphasize the urgent need for alignment with international standards to ensure clarity of scientific identity and promote interdisciplinary research in MEaSS.

KEYWORDS

academic scientific disciplines, M-EDF/01, M-EDF/02, scientific article, higher education

1 Introduction

In Italy, Movement, Exercise and Sport Sciences (MEaSS) have long been searching for an unambiguous definition in the organization of scientific knowledge in the academic field, addressing both epistemological concerns and issues related to scientific identity (Raiola et al., 2018). Epistemology, which is the branch of philosophy that deals with the nature, methods, and limitations of knowledge, plays a critical role in shaping the understanding and classification of knowledge within MEaSS (Jones et al., 2016). It prompts questions about the nature of scientific inquiry in this domain, the criteria for determining what counts as valid knowledge, and the methodologies used to acquire and validate knowledge (Raiola, 2023). Furthermore, the concept of scientific identity within MEaSS refers to the distinctive characteristics and principles that define the field's unique contribution to the academic community. It encompasses the specific theories, methodologies, and research practices that distinguish MEaSS from other disciplines (D'Isanto et al., 2022). Establishing a clear scientific identity is essential for MEaSS to assert its legitimacy within the broader academic landscape and to guide research agendas, educational curricula, and professional practices effectively (Invernizzi et al., 2023). The current Italian scientific organization is based on academic scientific disciplines (ASD), consisting of declarations that decline scientific subjects (Italy, 2000, 2015). In the area of MEaSS, there are two ASD: Physical training and methodology (code M-EDF/01) and Sport sciences and methodology (code M-EDF/02). The ASD of M-EDF/01 is concerned with the development and teaching of theories, techniques and methods for general physical and sports education aimed at particular age groups or classes. The ASD of M-EDF/02 deals with the development of theories, techniques and methods for the training and practice of different sports activities and assessments of athletic performance and aptitude (Italy, 2015). Since 2011, the two ASD of M-EDF have been concurrently operating within both the biomedical and pedagogical domains of the historical, philosophical, psychological, and pedagogical field (Italy, 2011). As a result, there has also been a definite division into two distinct areas of the Italian National Agency for the Evaluation of the Universities and Research Institutes (ANVUR): bibliometric and non-bibliometric. The bibliometric area utilizes quantitative analysis of publications, citations, and other bibliographic data to assess researchers' profiles and scientific production, while the non-bibliometric area employs qualitative methods and evaluation tools (Turri, 2014).

Consequently, researchers structured in Area 11 of Historical, philosophical, psychological and educational sciences within the declaration of the academic recruitment field of methodologies of teaching, special education and educational research (code 11/D2) in the broader sector of Pedagogy and educational theories, suffer in terms of identity due to the lack of the necessary minimum levels of knowledge articulation in the Sports science subfield (Raiola, 2023).

On the other hand, researchers structured in Area 06-Medicine are fully aligned with the criteria of the academic recruitment framework of MEaSS. However, their categorization within the broader sector of "Technology and Methodology in Medicine, Nursing, and Sport Sciences" is quite unusual, as it shifts the scientific focus toward medical care aspects. This leads to a blending of scientific paradigms related to performance and rehabilitation with those concerning general health, including aspects of recovery and rehabilitation following traumatic or chronic events, which are typical

in health professions. This leads to a dichotomous situation that contextualizes the two ASD of M-EDF in the areas of pedagogical and medical sciences, scientific knowledge with much longer and established tradition, resulting in identity issues for researchers in the sport sciences subfield (D'Elia et al., 2018; D'Isanto, 2019).

In the European Union (EU) and more widely in the international community, in contrast to the Italian schematic organization of academic knowledge, a different model is used, which is based on three types of scientific areas: physical and engineering sciences, life sciences, and social sciences and humanities. It is composed of specific panels (27) and sub-panels (419) of the European Research Council (ERC panel structure), proper to the scientific research steering body of the European Research Council Executive Agency (ERCEA, 2021). This European body, in its role as the public funder of research, evaluates projects for funding based on the ERC panel structure. It makes it possible to identify and assign the area, panels and sub-panels to which the topic relates for assignment to the international expert reviewers of the specific field of knowledge (Cruickshank et al., 2020). Consequently, the ERC scheme assumes the basis from which specific research fields are officially identified throughout the EU and which is also reflected on major research product databases, such as SCOPUS and Web of science, through the use of fields, domains and keywords (Laudel and Gläser, 2014; Müller and de Rijcke, 2017). Italy needs to align with international rules also because it is one of the achievements to be achieved to get the funding of the National Recovery and Resilience Plan (NRRP) provided by the EU (Italy, 2021). ASD will be reorganized and simplified based on the current declarations and the development of scientific lines by applying the new legislative requirements of "cultural and educational scientific relevance and affinity for the renewal of ASD into ASD Groups" (Italy, 2022). The current dual presence of ASD, in science area 6 (Medical sciences) and area 11 (Historical, philosophical, psychological and educational sciences), has also generated misleading in individual universities on undergraduate education for the perpetuation of the ambiguity with which new generations of exercise science graduates are formed (Raiola, 2019, 2020a,b; D'Elia et al., 2023; D'Isanto et al., 2023).

The confusion exists not only within the national academic system but also extends to the other member countries of the European Union. Currently, the integrity of international relationships regarding research and evaluation of specific projects during participation in competitive grants is compromised (Edwards and Roy, 2017). The identification of the most suitable scientific profiles of the respective referees is also challenging (Ioannidis et al., 2015). Project evaluation is based on a common protocol for all European Union countries, the ERC scheme, consisting of areas, panels, and subpanels (Reale and Zinilli, 2017). The allocation into two academic recruitment fields of diverse scientific areas guides evaluative choices toward those areas with a greater number of researchers with significant elements typical of international evaluation (indexed articles, total citations, and h-index), often resulting in the exclusion of projects that do not fit into these indicators, namely those typical of Area 11 and the pedagogical field, which adopt an "Italian" parametric system based on scientific products and A-class scientific outputs, as well as monographs (Bertocchi et al., 2015). In addition, the widespread use of bibliometric metrics for analyzing the impact of scientific production on the academic community raises several questions. Firstly, there is the exclusive reliance on peer review in the Italian scientific community. Secondly, the lack of formalization in standardizing bibliometric

metrics complicates the evaluation process due to the multiplicity of databases with different criteria and parameters (Baccini et al., 2019).

In the scientific literature, there is a growing interest in assessing researchers' scientific coherence within specific scientific fields using bibliometric metrics weighted by domains, fields, and subfields. This evaluation aims to measure the influence on the relevant academic community (Batista et al., 2006; Bornmann and Daniel, 2007). However, there is still a lack of systematic studies at the national level addressing the evaluation of the scientific production of researchers and professors in accordance with international standards. Therefore, it is essential to conduct a thorough survey that assesses the consistency of the scientific production of researchers active in the two ASDs of M-EDF/01 and M-EDF/02 in Italy, aligning with international evaluation practices.

For these reasons, this study intends to analyze the qualitatively most representative scientific production of the ASDs of M-EDF/01 and M-EDF/02 and to verify the relevance of the study title to either of the two declarations or any affinity to the biomedical area or the pedagogical domain or other ASD. The null hypothesis predicts the correspondence of the titling of the scientific article to the individual ASDs of M-EDF/01 and M-EDF/02. In contrast, the alternative hypothesis predicts an affinity to the biomedical area, to the pedagogical domain or with another ASD. In addition to determining the percentage of work attributed to the 2 ASD (in an aggregated manner by MEaSS area and disaggregated manner by individual ASD), the study tests what kind of relationship there is between the aggregated and disaggregated ASD and the biomedical area or pedagogical area.

2 Methods

2.1 Study participants

To be representative of the quality of scientific production, the sample consists exclusively of the scientific production of the entire population of Italian full professors ($n=27$) of M-EDF/01 and M-EDF/02 because of their high scientific and academic standing. The ASD of M-EDF/01 consists of 13 afferents of the biomedical area and 5 afferents of the pedagogical domain. The ASD M-EDF/02 consists of 8 afferents to the biomedical area and 1 afferent to the pedagogical domain.

2.2 Procedures

Each full professor's top 20 scientific products, ranked by the highest number of citations within the Google Scholar database, were analyzed considering the period up to February 15, 2023. Google Scholar automatically indexes all scientific production available on the web along with related citations. The allocation of the scientific output to the disciplinary domains of Biomedical, Pedagogical, Psychological, or Sports was determined according to the declarations of the academic recruitment fields proposed by the Italian National University Council (CUN) and formalized by the Minister of University and research (Italy, 2000):

- Code 11/D2: Pedagogy and educational theories (Pedagogical domain)

- Code 06/N2: Physical training and sports sciences (Sports domain)
- Code 06/B1: Internal medicine; Code 06/F4: Orthopedics and rehabilitation medicine (Biomedical domain)
- Code 11/E2: Developmental and educational psychology (Psychological domain)

2.3 Statistical analysis

Central tendency and dispersion indices were calculated to analyze for each ASD the number of studies attributable to the 4 disciplinary areas (sport, pedagogical, biomedical, psychological). The normal distribution of the data was checked using the Shapiro–Wilk test. Then, using 1-way ANOVA and Bonferroni's *post hoc* test, it was possible to check the relevance of the study title to the current ASD declaratory of M-EDF/01 and M-EDF/02 or any affinity to the biomedical or pedagogical field (re-search topics of other ASD related to those of M-EDF). ANOVA was chosen because there is only one independent variable (ASD) and more than two dependent variables (disciplinary domains) in this study. Data analysis was performed using the Statistical Package for Social Science software (IBM SPSS Statistics for Windows, version 27.0. Armonk, NY). Significance was set at $p < 0.05$.

3 Results

In the first stage of the study, the percentage consistency of scientific, cultural and educational relevance and affinity was determined. The analysis showed that in the scientific production of the 18 full professors of the ASD of M-EDF/01, there is a prevalence of studies ascribed to the biomedical domain. Scientific production among full professors in the ASD of M-EDF/01 in the biomedical area is distributed as follows in Table 1: 152 articles for the biomedical domain (58.5%), 85 for the sports domain (32.7%), 18 for the pedagogical domain (6.9%) and 5 in the psychological domain (1.9%). Among the full professors in the ASD of M-EDF/01 in the pedagogical area, 57 articles fall within the pedagogical domain (57%), 25 within the sports domain (25%), 13 within the biomedical domain (13%) and 5 within the psychological domain (5%).

In addition to determining the percentage of papers attributed to the two ASD, the study tested what kind of relationship there was between the aggregated and dis-aggregated of ASD and the biomedical area or the pedagogical domain of the historical, philosophical, psychological, and pedagogical area. Through the one-way ANOVA and Bonferroni's *post hoc* test, it was possible to check the relevance of the study title to the current ASD declaratory of M-EDF/01 and M-EDF/02 or any affinity to the biomedical or pedagogical domain. Thus, the percentage consistency describing the phenomenon and the significance of the relationships investigated emerged.

Table 2 shows that there is a significant difference between the variables ($p=0.001$). This allows to reject the null hypothesis and accept the alternative hypothesis, as the prevalence of research topics of other ASDs related to those of M-EDF emerges in the scientific production. From Bonferroni's *post hoc* test, a significant difference was found between the sports domain and the psychological domain ($p=0.042$)

TABLE 1 The number of studies attributable to the 4 disciplinary domains for the ASD of M-EDF/01.

18 professor of M-EDF/01 (13 from biomedical area; 5 from pedagogical domain)	Disciplinary domains			
	Sport	Pedagogical	Biomedical	Psychological
N° of study	110 (30.6%)	75 (20.8%)	165 (45.8%)	10 (2.8%)
Mean	6.11	4.16	9.16	0.55
Mode	1	0	0	0
Median	3.5	0	8	0
Standard deviation	6.1	6.9	7.5	0.9

TABLE 2 Analysis of one-way ANOVA and Bonferroni's post hoc test for the ASD of M-EDF/01.

	Sum of Squares	df	Mean Square	F	Sig.
Between groups	702.778	3	234.259	6.515	0.001
Within groups	2445.222	68	35.959		
Total	3148.000	71			

(I) Disciplinary domain	(J) Disciplinary domains	Mean difference (I-J)	Std. Error	Sig.
Sport	Biomedical	1.94444	1.99886	1.000
	Pedagogical	-3.05556	1.99886	0.786
	Psychological	5.55556*	1.99886	0.042
Biomedical	sport	-1.94444	1.99886	1.000
	Pedagogical	-5.00000	1.99886	0.089
	Psychological	3.61111	1.99886	0.452
Pedagogical	Sport	3.05556	1.99886	0.786
	Biomedical	5.00000	1.99886	0.089
	Psychological	8.61111*	1.99886	0.001
Psychological	Sport	-5.55556*	1.99886	0.042
	Biomedical	-3.61111	1.99886	0.452
	Pedagogical	-8.61111*	1.99886	0.001

*The mean difference is significant at the 0.05 level.

and between the pedagogical domain and the psychological domain ($p=0.001$). There-fore, in the ASD of M-EDF/01, emerges the relevance of scientific production to the pedagogical field of historical, philosophical psychological area.

In the scientific production of the 9 full professors of M-EDF/02, however, there is a prevalence of studies ascribed to the biomedical domain. Scientific production among full professors in the ASD of M-EDF/02 in the biomedical area is distributed as follows as show in Table 3: 76 articles for the biomedical domain (47.5%), 40 articles for the sports domain (25%), 29 articles for the pedagogical domain (18.1%) and 15 articles in the psychological domain (9.4%). Among the full professors in the ASD of M-EDF/02 from the pedagogical area, 12 articles fall within the sports domain (60%), 4 within the

pedagogical domain (20%), 3 within the biomedical domain (15%) and 1 within the psychological domain (5%).

Table 4 shows that there is a significant difference between the variables ($p=0.020$). This allows to reject the null hypothesis and accept the alternative hypothesis, as the prevalence of research topics of other ASDs related to M-EDF emerges in the scientific production. By Bonferroni's post hoc test, a significant difference was found between the biomedical domain and the psychological domain ($p=0.019$). Therefore, relevance to the biomedical area prevails in the ASD of M-EDF/02.

4 Discussion

This study aimed to test whether the simultaneous allocation of the two ASD of MEaSS in both the biomedical scientific area and the pedagogical domain of the historical, philosophical, psychological and educational scientific area would result in a loss of scientific knowledge identity and epistemological damage. To verify the existence of epistemological damage, the size of the percentage numerosity of the three and other possible domains was measured by analyzing the type of scientific production of the most influential Italian professors framed in the ASD of M-EDF/01 and M-EDF/02. It was intended to check the relevance of the titling of each scientific product to the two ASD declarations of M-EDF/01 and M-EDF/02 or any affinity to the biomedical area or the pedagogical domain. The prevalence of studies pertaining to the biomedical domain confirms that the new structure/reorganization of the Italian academic body for the field of MEaSS has amplified the differences with the ERC scheme. To overcome these critical issues, part of the CUN's proposals in 2018 could be adopted by following the scientific affinity criteria of a new classification model of ASD called "disciplinary clusters" (CUN, 2018). This model, which would not require legal amendments, would streamline the application scope of exercise and sport sciences concerning research, teaching, and competition procedures. This approach could be also enhanced by utilizing a search domain consisting of fixed keywords, common to all those within the disciplinary grouping, as well as dynamic keywords chosen by researchers based on their own interdisciplinary criteria. This restructuring would resemble the ERC model, which comprises areas, panels, and subpanels, representing the segmentation of the research domain into keywords. Furthermore, it would address the national classification dichotomy between Social and Human Sciences (SH) and Life Sciences (LS), a division that lacks coherence within the European context.

TABLE 3 The number of studies attributable to the 4 disciplinary domains for the ASD of M-EDF/02.

9 professor of M-EDF/02 (8 from biomedical area; 1 from pedagogical domain)	Disciplinary domains			
	Sport	Pedagogical	Biomedical	Psychological
N° of study	52 (28.9%)	33 (18.3%)	79 (43.9%)	16 (8.9%)
Mean	5.77	3.66	8.77	1.77
Mode	0	0	4	0
Median	5	3	5	0
Standard deviation	4.35	3.67	6.22	3.89

TABLE 4 Analysis of one-way ANOVA and Bonferroni's post hoc test for the ASD of M-EDF/02.

	Sum of squares	df	Mean square	F	Sig.
Between groups	243.333	3	81.111	3.758	0.020
Within groups	690.667	32	21.583		
Total	934.000	35			

(I) Disciplinary domain	(J) Disciplinary domains	Mean difference (I-J)	Std. Error	Sig.
Sport	Biomedical	-3.00000	2.19004	1.000
	Pedagogical	2.11111	2.19004	1.000
	Psychological	4.00000	2.19004	0.463
Biomedical	Sport	3.00000	2.19004	1.000
	Pedagogical	5.11111	2.19004	0.156
	Psychological	7.00000*	2.19004	0.019
Pedagogical	Sport	-2.11111	2.19004	1.000
	Biomedical	-5.11111	2.19004	0.156
	Psychological	1.88889	2.19004	1.000
Psychological	Sport	-4.00000	2.19004	0.463
	Biomedical	-7.00000*	2.19004	0.019
	Pedagogical	-1.88889	2.19004	1.000

*The mean difference is significant at the 0.05 level.

Certainly, more straightforward would be the procedures for evaluating research and related researchers on grants, PRIN or any other international project, along the lines of the ERC scheme. Researchers would choose their scientific profile based on the keywords defined for all by the domain they belong to on the line of the ERC scheme, with additional keywords freely chosen by the researcher also in an interdisciplinary key, including the psycho-educational and biomedical part. This hypothesis could already be applied in replacement of the two ASD of M-EDF, simultaneously framed in 06/N2, medical area 6, and 11/D2, historical, philosophical, psychological and educational scientific area. This would overcome the current division while preserving the rights of

all structured people and opening a new way for the disciplines of the sports domain.

Since no previous study has addressed this specific issue in the field of MEaSS, comparisons of results could not be made. Beyond the original topic of this study, there is not a wide range of published research that has analyzed research methods in MEaSS.

To measure the consistency of the impact of Italian researchers' scientific production, additional analyses could provide crucial elements for assessing the quality and influence of research conducted in the field of Physical activity and Sports science. In this way, a more comprehensive understanding of the involvement of Italian researchers in the international context of sports science could be achieved. The study on the entire population of scientific products from Scopus Elsevier, derived from [Ioannidis et al. \(2020\)](#), has made it clear that the application of a complex data categorization method and a specific mathematical formula has scientifically validated the impact that the top 100,000 scientists worldwide have on their scientific communities. The question of the consistency of the impact of scientific production is particularly pertinent for the Italian academic scientific organization due to the unique background of researchers within the Sports science framework ([Raiola et al., 2024](#)). Additionally, related scientific knowledge plays a significant role in shaping the scientific identity of researchers associated with the ASD of M-EDF/01 and M-EDF/02. Furthermore, since the Scopus database offers the opportunity to identify and distinguish between the first author, the last author, co-authors, and individual authors within scientific publications, it would be possible to assess the consistency of the impact of Italian researchers' scientific production, particularly in the context of analytical contributions in collaborative works within the Sports science domain.

5 Conclusion

The problem of the different consistency of the scientific profiles of full professors concerning the two ASD was confirmed causing damage to the ordinary scientific development of MEaSS since there is a congruent consistency of affinity of the biomedical, and psycho-pedagogical domains. The limitation of this study is that the survey was conducted by considering only the titling of scientific products, thus not considering articles not related to the field of MEaSS even through keyword analysis first and abstract later.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Author contributions

GA collected the data. GE and FD'E initially analyzed the data, with GR moderating this process, along with TD'I. GR completed final analysis and writing and presentation of the data in the results. TD'I wrote part of the discussion. GR proofed the first draft. FD'E, GR, and GE all provided editing and revising for the final version. All authors contributed to the conceptual development of this project.

References

- Baccini, A., De Nicolao, G., and Petrovich, E. (2019). Citation gaming induced by bibliometric evaluation: a country-level comparative analysis. *PLoS One* 14:e0221212. doi: 10.1371/journal.pone.0221212
- Batista, P. D., Campiteli, M. G., and Kinouchi, O. (2006). Is it possible to compare researchers with different scientific interests? *Scientometrics* 68, 179–189. doi: 10.1007/s11192-006-0090-4
- Bertocchi, G., Gambardella, A., Jappelli, T., Nappi, C. A., and Peracchi, F. (2015). Bibliometric evaluation vs. informed peer review: evidence from Italy. *Res. Policy* 44, 451–466. doi: 10.1016/j.respol.2014.08.004
- Bornmann, L., and Daniel, H. D. (2007). What do we know about the h index? *J. Am. Soc. Inf. Sci. Technol.* 58, 1381–1385. doi: 10.1002/asi.20609
- Cruickshank, A., Martindale, A., and Collins, D. (2020). Raising our game: the necessity and progression of expertise-based training in applied sport psychology. *J. Appl. Sport Psychol.* 32, 237–255. doi: 10.1080/10413200.2018.1492471
- CUN (2018). *General opinion no. 22. Prot. No. 14130 dated 7/5/2018. Towards a model for updating and rationalizing the classification of academic knowledge and the system of study course classes, also given the flexibility and internationalization of the educational offer.* Available at: <https://www.sidea.org/wp2/wp-content/uploads/2021/08/PARERE-CUN-2018-SAPERI-E-OFFERTA-FORMATIVA.pdf>
- D'Elia, F., D'Isanto, T., Esposito, G., Altavilla, G., and Raiola, G. (2023). Physical activity and sports science in Italian scientific research products. *Health Sport Rehabil* 9, 1–7. doi: 10.34142/HSR.2023.09.02.03
- D'Elia, F., Mazzeo, F., and Raiola, G. (2018). The core curriculum in the university training of the teacher of physical education in Italy. *J. Hum. Sport Exerc.* 13, S413–S420. doi: 10.14198/jhse.2018.13.Proc2.25
- D'Isanto, T. (2019). Physical and sport education between Italian academic system and European Research Council structure panel. *J. Hum. Sport Exerc.* 14, S66–S76. doi: 10.14198/jhse.2019.14.Proc1.08
- D'Isanto, T., Altavilla, G., Esposito, G., Raiola, G., and D'Elia, F. (2023). Physical activity and sports sciences field in Italian scientific research products and its distinct composition in biomedicine, exercise and sports sciences and pedagogy domains. *Sport Sci. Health* 19, 987–991. doi: 10.1007/s11332-023-01045-z
- D'Isanto, T., D'Elia, F., Altavilla, G., Aliberti, S., Esposito, G., Di Domenico, F., et al. (2022). In Italy compatibility between qualifying training objectives of degree courses in sport sciences and exercise and the kinesiology profile. *Trends Sport Sci.* 29, 99–105. doi: 10.23829/TSS.2022.29.3-3
- Edwards, M. A., and Roy, S. (2017). Academic research in the 21st century: maintaining scientific integrity in a climate of perverse incentives and hypercompetition. *Environ. Eng. Sci.* 34, 51–61. doi: 10.1089/ees.2016.0223
- ERCEA (2021). *European Research Council scheme 2021.* Belgium: Brussels Available at: https://erc.europa.eu/sites/default/files/document/file/ERC_Panel_structure_2021_2022.pdf.
- Invernizzi, P., Signorini, G., Scurati, R., Mauro, F., Rigon, M., Trecroci, A., et al. (2023). Analysis of an ontological plan for physical and sports education in the Italian cultural reality: a preliminary survey. *Adv. Phys. Educ.* 13, 255–287. doi: 10.4236/ape.2023.134022
- Ioannidis, J. P., Boyack, K. W., and Baas, J. (2020). Updated science-wide author databases of standardized citation indicators. *PLoS Biol.* 18:e3000918. doi: 10.1371/journal.pbio.3000918
- Ioannidis, J. P., Fanelli, D., Dunne, D. D., and Goodman, S. N. (2015). Meta-research: evaluation and improvement of research methods and practices. *PLoS Biol.* 13:e1002264. doi: 10.1371/journal.pbio.1002264
- Italy (2000). *Ministerial decree no. 175 of 4 October 2000. Academic scientific disciplines.* Available at: <http://attiministeriali.miur.it/anno-2000/ottobre/dm-04102000.aspx>
- Italy (2011). *Ministerial Decree no. 203 of 1 September 2011. Determinazione dei settori concorsuali, raggruppati in macrosettori concorsuali.* Available at: <https://www.gazzettaufficiale.it/eli/id/2011/09/01/11A11321/sg>
- Italy (2015). *Ministerial decree no. 855 of 30 October 2015. Redetermination of academic recruitment fields.* Available at: http://attiministeriali.miur.it/media/265766/decreto_855_2015.pdf
- Italy (2021). *National recovery and resilience plan.* Rome: Italy Available at: <https://www.governo.it/sites/governo.it/files/PNRR.pdf>.
- Italy (2022). *Law June 29, 2022, n. 79. Conversione in legge, con modificazioni, del decreto-legge 30 aprile 2022, n. 36, recante ulteriori misure urgenti per l'attuazione del Piano nazionale di ripresa e resilienza (PNRR).* Available at: <https://www.gazzettaufficiale.it/eli/id/2022/06/29/22G00091/sg>
- Jones, R. L., Edwards, C., and Viotto Filho, I. T. (2016). Activity theory, complexity and sports coaching: an epistemology for a discipline. *Sport Educ. Soc.* 21, 200–216. doi: 10.1080/13573322.2014.895713
- Laudel, G., and Gläser, J. (2014). Beyond breakthrough research: epistemic properties of research and their consequences for research funding. *Res. Policy* 43, 1204–1216. doi: 10.1016/j.respol.2014.02.006
- Müller, R., and de Rijck, S. (2017). Exploring the epistemic impacts of academic performance indicators in the life sciences. *Res. Eval.* 26, 157–168. doi: 10.1093/reseval/rvx023
- Raiola, G. (2019). Complex study for an epistemology of exercise and sport sciences: (a) keyconcepts of both ERC subpanels and CUN keywords; (b) physical training and sport methodology sciences academic disciplines in pedagogy recruitment sector and biomedical one: a correlations study. *J. Phys. Educ. Sport* 19, 1748–1754. doi: 10.7752/jpes.2019.s5255
- Raiola, G. (2020a). Proposal of rearrangement of physical training and sport sciences methodology academic disciplines in Italian university body. *Sport Sci.* 14, 43–47.
- Raiola, G. (2020b). The movement and sport science in Italy towards the European research council. *Phys. Cult. Sport Stud. Res.* 86, 37–48. doi: 10.2478/pccsr-2020-0011
- Raiola, G. (2023). University training for physical education teachers, sports and preventive and adapted physical activities kinesiology and sports manager. *Acta Kinesiol.* 17, 55–59. doi: 10.51371/issn.1840-2976.2023.17.1.8
- Raiola, G., D'Elia, F., and Altavilla, G. (2018). Physical activity and sports sciences between European Research Council and academic disciplines in Italy. *J. Hum. Sport Exerc.* 13, 283–295. doi: 10.14198/jhse.2018.13.Proc2.13
- Raiola, G., Esposito, G., and D'Isanto, T. (2024). Impact of scientific contributions by Italian researchers in the subfield of 'Sport Sciences' using some topic-specific keywords. *Acta Kinesiol.* 18, 56–62. doi: 10.51371/issn.1840-2976.2024.18.1.7
- Reale, E., and Zinilli, A. (2017). Evaluation for the allocation of university research project funding: can rules improve the peer review? *Res. Eval.* 26, 190–198. doi: 10.1093/reseval/rvx019
- Turri, M. (2014). The new Italian agency for the evaluation of the university system (ANVUR): a need for governance or legitimacy? *Qual. High. Educ.* 20, 64–82. doi: 10.1080/13538322.2014.889429

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.