



# Scientific relevance and affinity in the declarations of the groups and academic disciplines in physical exercise and sport sciences

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## Abstract

**Purpose** In Italy, following the definition of scientific-disciplinary groups (SDG) and the update of academic disciplines (AD) with their respective declarations, a significant legislative change occurred. This led to the merging of the two ADs of Physical Training Sciences and Methodology (code M-EDF/01) and Sport Sciences and Methodology (code M-EDF/02) into a single SDG called Physical Exercise and Sport Sciences. Consequently, there should be full scientific autonomy for this new SDG. However, residual interference from the former related ADs persists, which is now redundant, since the new SDG encompasses all relevant affinities. Therefore, other ADs and SDGs should not reference the SDG and ADs titles of Physical Exercise and Sport Sciences in their declarations. The study aimed to verify if there were any duplications compared to the previous university body, to what extent these duplications existed, and to identify the specific instances of duplication.

**Methods** A textual analysis of the scientific declarations of the 190 SDGs and 383 ADs was conducted in comparison with the corresponding previous declarations of the academic recruitment fields (ARF) and ADs. The analysis was conducted using specific keywords.

**Results** The analysis of Ministerial Decree (DM) n. 639 of 2024 found that the keyword “Sport” is present in 21 SDGs and 23 ADs, ranging from zoology and physiology to aerospace engineering and law. For “Physical training or education or exercise”, 7 SDGs and 6 ADs were identified, including musculoskeletal system diseases, cellular biology, and special education. Compared with the DM n. 885 of 2000, the keyword “Sport” appears in 15 ARFs and 10 ADs, while “Physical training or education or exercise” appears in 13 ARFs and 9 ADs, in similar areas.

**Conclusions** The overlaps in the scientific declarations of the 180 SDGs and the 383 ADs were supposed to decrease due to their unique scientific, cultural, and educational relevance and affinity; instead, they have increased. Similarly, this occurred with the updated declarations of the ADs. An even more concerning aspect is that the declaration of SDG in Area 11 of Historical, Philosophical, Pedagogical and Psychological Sciences contains a significant overlap between the SDG of Educational research, teaching, special pedagogy, and experimental pedagogy (code 11/PAED-02) and the SDG of Physical Exercise and Sport Sciences (code 06/MEDF-01), perpetuating the current confusion.

**Keywords** Sport · Exercise · Physical training · Movement · Education

## Introduction

In Italy, Physical Exercise and Sport Sciences (PESS) have long been seeking a definitive structure within the organization of specific scientific knowledge in the university context. The Italian system classifies scientific knowledge into scientific areas defined by the Italian National University Council (CUN), academic recruitment fields (ARF), and academic disciplines (AD) within 14 scientific areas. The formal recognition of PESS scientific knowledge dates back to 2000 [1], with the establishment of two ADs called “Physical Training Sciences and Methodology” (code M-EDF/01) and “Sport

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Sciences and Methodology” (code M-EDF/02). The components of the declarations for these two ADs have been detailed in the table attached to Legislative Decree n. 178 of 8 May 1998 and are reported in Table 1 [2]. With Ministerial Decree (DM) n. 336 of 29 July 2011 [3], the two ADs of PESS scientific knowledge were grouped into 9 ARFs, as shown in Table 2, later reduced to 2 with DM n. 885 of 30 October 2015 [4], as reported in Table 3. Following the recommendation from the meeting on July 5, 2017, the CUN requested that the Ministry of University and Research (MUR) place the two ADs of PESS scientific knowledge in Area 6 of Medical Sciences, aligning with the previously carried out merger [5]. Subsequently, the MUR crystallized the two ADs of PESS scientific knowledge into two CUN scientific areas. Academics were definitively allocated, with some assigned to Area 6 (Medical Sciences) and others to Area 11 (Historical, Philosophical, Pedagogical and Psychological Sciences), as certified by the CINECA database. This division split the field of PESS scientific knowledge into two parts, resulting in professors being distributed between two different CUN areas (6 and 11) for the two ADs, with the code M-EDF, representing a unique case within the university body. Currently, the division consists of 48 full professors divided into 2 parts: 39 in Area 6 (81.2%) and 9 in Area 11 (18.7%). There are 115 associate professors divided into another 2 parts: 96 in Area 6 (83.4%) and 19 in Area 11 (16.5%). Finally, the 103 researchers are divided into yet another 2 parts: 86 in Area 6 (83.5%) and 17 in Area 11 (16.5%). The fragmentation of PESS scientific knowledge and academics began in 2011 with the creation of the 9 ARFs. This fragmentation was refined in 2015 and continues to date, with only 2 ARFs remaining: physical training and sports sciences (code 06/N2) and Methodologies of teaching, special education, and educational research (code 11/D2). The CUN, with its general opinion n. 22 of 7 May 2018, stated that “It was necessary to limit the aporias resulting from the different meanings that subsequent rules have attributed to aggregates imagined and configured for different purposes” [6]. The term *aporia*, defined as a “logical difficulty encountered in a speculative process that appears to have no immediate solution” [7], refers to the situation where multiple allocations of the same AD occur. The CUN proposes to unambiguously correspond each AD to its respective ARF.

This division, both of sport-specific scientific knowledge and of related academics, has developed a dual epistemology, thus leading to an *aporia* for the two scientific identities based on normative and non-scientific reasons [8]. The distinct paradigmatic foundations of Medical Sciences and Historical, Philosophical, Pedagogical and Psychological Sciences have further widened this divergence due to their contrasting traditions in research output publication methods: bibliometric and non-bibliometric [9]. Moreover, the declaration of ARF 11/D2 did not contain any mention of the PESS scientific knowledge,

as it included elements not coordinated with the contents of the other pedagogical ADs included in the ARF [4]. It was only at the end of the text that the words “education in physical and sport activities” appeared, without any recognition of the two ADs of PESS scientific knowledge. Furthermore, there was a lack of necessary reference to the title of the two ADs of PESS knowledge, as was the case for the declarations referring to the two ADs of Methodologies of teaching and Special education (code M-PED/03) and Experimental Pedagogy (code M-PED/04). The statement of ARF 06/N2, on the other hand, totally identified with the contents of the ARF of the PESS. However, there was a strong atypicality in its placement within the Academic Recruitment Group of Technology and methodology in medicine, nursing and sport sciences [4]. This placement inevitably shifted the scientific focus towards medical-assistance aspects, creating distortions as it combines the scientific paradigm of performance and physical re-education with that of general health and the related aspects of functional recovery following rehabilitation, typical of healthcare professions.

According to the aforementioned general opinion n. 22 of 7 May 2018 [6], the CUN emphasized the necessity of reorganizing scientific knowledge concerning ADs to tackle their inherent complexities and primary challenges. The previous framework often prioritized quantitative considerations over interdisciplinary relationships grounded in cultural affinity. Consequently, in alignment with Law n. 79 of 30 June 2022 [10], it proposed the establishment of Scientific-Disciplinary Groups (SDG) and the revision of ADs during the session held on 22 March 2023 [11]. These were subsequently refined and modified during CUN session on 26 July 2023 and 20 December 2023, aiming to establish a singular SDG for PESS. This definition and update allows PESS to align education, health, sport and wellness with the international context, as required by the European Union for the obligations of the National Recovery and Resilience Plan. This regulatory provision allowed the MUR, following a proposal by the CUN, to bring Italy into line with the international scientific context with the simultaneous classification of teaching and research with SDGs containing the basic elements of the research domains.

The declarations of the SDGs summarize the key aspects of teaching and research along with the recruitment of university professors, which otherwise remained distinct and separate between ADs and ARFs. In an effort to bridge the gap between teaching and research, and to facilitate the recruitment of university professors, the CUN identified 2600 keywords during its meeting on 28 September 2016 [12]. These keywords align with international research domain standards. They are categorized into fixed keywords, which remain consistent across

researchers in specific ADs, and mobile keywords, which reflect the individual thematic focuses of researchers.

With DM n. 639 of 2 May 2024 [13], the two ADs of PESS scientific knowledge are framed in the single SDG of Area 6 of Medical Sciences, called “Physical Exercise and Sport Sciences” (code 06/MEDF-01). This setup guarantees identity and scientific autonomy; however, the residual interference of the previous “related” ADs still remains, which no longer has any reason to exist, because the SDG also contains affinities. The other ADs and SDGs should not have any reference to the titles of the PESS in their scientific declarations. The aim of this study is to ascertain whether there are and what the difference is compared to the previous university body.

## Methods

A textual analysis was conducted on the scientific descriptions of the current 190 SDGs and 383 ADs as specified in Annex A of DM n. 639 of 2 May 2024 [13]. This was compared with the corresponding previous descriptions of the ARFs from Annex B of DM n. 855 of 30 October 2015 [4], and the ADs from Annex B of DM of 4 October 2000 [1], as reported in Tables 4 and 5. The analysis utilized five keywords: “Sport, Physical training-Education-Exercise-Movement”.

## Results

## Discussion

The aim of this study was to determine whether, compared to the previous university system, other ADs and SDGs included references to the titles of the SDG and ASDs of PESS in their

scientific declarations, and to what extent. Based on keyword search results for “Sport” related to DM n. 639 of 2024, the 21 SDGs included span diverse fields from zoology and anthropology (05/BIOS-03) to physiology (05/BIOS-06), and from anatomy (05/BIOS-12) to internal medicine (06/B1). In addition, disciplines such as aerospace and naval engineering (09/IIND-01), pedagogy (11/PAED-01), and various fields of law (12/GIUR-01, 12/GIUR-02, 12/GIUR-11, and 12/GIUR-12) are represented. The analysis confirms that the SDG for PESS overlaps with related fields. Similarly, in the AD category, the keyword “Sport” is associated with slightly more ADs compared to the SDGs, totaling 23 ADs. These range from anthropology (BIOS-03/B) to biochemistry (BIOS-07/A), pharmacology (BIOS-11/A), anatomy (BIOS-12/A), and musculoskeletal diseases (MEDS-19/A). Disciplines such as naval architecture (IIND-01/A), history of pedagogy (PAED-01/B), work psychology (PSIC-03/B), and various fields of law (GIUR-01/A, GIUR-02/B, GIUR-11/A, and GIUR-12/A) are also included. Regarding the keyword “Physical training or education or exercise” within the SDG category, it is found across 7 disciplines including musculoskeletal disorders (06/MEDS-19), manufacturing technologies and systems (09/IIND-04), cellular biology (05/BIOS-10), science of health professions diagnostic techniques (06/MEDS-26), and human anatomy (05/BIOS-12). In addition, areas related to educational research and special pedagogy (11/PAED-02) and general psychology (11/PSIC-01) are covered. Similarly, in the AD category for “Physical training or education or exercise,” 6 ADs are found. A significant concern is the overlap within the SDG declarations for Didactics, Special Pedagogy, and Experimental Pedagogy (code 11/PAED-02). Specifically, “physical education aimed at specific age groups throughout life”, “theories, methods, and didactics for physical and sports education during school age,” and “initiation to youth and school sports and practice of different sports disciplines” show considerable overlap with the SDG of PESS (code 06/MEDF-01). The declaratory of 06/MEDF-01 includes the

**Table 1** Declaratory of the 2 ADs of PESS scientific knowledge detailed in the table attached to Legislative Decree n. 178 of 8 May 1998 [2]

M-EDF/01—physical training sciences and methodology
Theory and methodology of human movement
Theory, technique and didactics of physical activity for the developmental age
Theory, technique and didactics of physical activities for adulthood and the elderly
Theory, technique and didactics of group, recreational and leisure physical activities
Theory, technique and didactics of "adapted" physical and sports activities
Theory, technique and didactics of preventive and compensatory physical education
M-EDF/02—sport sciences and methodology
Training theory and methodology
Theory, technique and didactics of individual sports
Theory, technique and didactics of team sports
Theory, technique and didactics of swimming sports
Methods of physical and aptitude assessment in sport
Organisation of sports bodies

**Table 2** Determination of ARFs, framed into group of academic recruitment fields detailed in DM n. 336 of 29 July 2011 [3]

Group of academic recruitment fields	Academic recruitment field	Academic discipline
05/D—physiology	05/D1—physiology	BIO/09—physiology M-EDF/01 M-EDF/02
05/E—experimental and clinical biochemistry and molecular biology	05/E1—general biochemistry and clinical biochemistry	BIO/10—biochemistry BIO/12—clinical biochemistry and molecular biology M-EDF/01 M-EDF/02
05/F—experimental biology	05/F1—experimental biology	BIO/13—experimental biology M-EDF/01 M-EDF/02
05/H—human anatomy and histology	05/H1—human anatomy	BIO/16—Human anatomy M-EDF/01 M-EDF/02
05/L—physical training and sports sciences	05/L1—physical training and sports sciences	M-EDF/01 M-EDF/02
06/B—general clinical medicine	06/B1—internal medicine	MED/09—internal medicine M-EDF/01 M-EDF/02
06/D—medical specialities	06/D2—endocrinology, nephrology, food and wellness science	MED/13—endocrinology MED/49—food and dietetic sciences MED/14—nephrology M-EDF/01 M-EDF/02
06/N—health professions and applied medical technology	06/N1—sciences of health professions and applied medical technology	MED/46—technical sciences of laboratory medicine MED/48—nursing in neuropsychiatry and rehabilitation MED/47—obstetrical–gynecological nursing sciences MED/49—food and dietetic sciences MED/50—applied medical technology and methodology M-EDF/01 M-EDF/02
11/D—pedagogy and educational theories	11/D2—methodologies of teaching, special education and educational research	M-PED/03—methodologies of teaching and special education M-PED/04—educational research M-EDF/01 M-EDF/02

**Table 3** Redetermination of ARFs, framed into group of academic recruitment fields detailed in DM n. 885 of 30 October 2015 [4]

Group of academic recruitment fields	Academic recruitment field	Academic discipline
06/N—technology and methodology in medicine, nursing and sport sciences	06/N2—physical training and sports sciences	M-EDF/01 M-EDF/02
11/D—pedagogy and educational theories	11/D2—methodologies of teaching, special education and educational research	M-PED/03—methodologies of teaching and special education M-PED/04 educational research M-EDF/01 M-EDF/02

**Table 4** Keyword analysis in Annex A of DM n. 639 of 02 May 2024 [13]

Keyword	Scientific-disciplinary groups	Academic discipline
Sport	05/BIOS-03 Animal biology and anthropology	BIOS-03/B Anthropology
	05/BIOS-06 Physiology	BIOS-06/A Physiology
	05/BIOS-07 Biochemistry	BIOS-07/A Biochemistry
	05/G1 Pharmacology	BIOS-11/A Pharmacology
	05/BIOS-12 Human anatomy	BIOS-12/A Human anatomy
	06/B1 Internal medicine	MEDS-05/A Internal medicine
	06/MEDS-08 Endocrinology	MEDS-08/A Endocrinology
	06/MEDS-19 Diseases of the musculoskeletal system	MEDS-19/A Diseases of the musculoskeletal system
	06/MEDS-22 Images Diagnostic	MEDS-22/A Images Diagnostic
	07/AGRI-09 Animal science and technology	AGRI-09/A General zootechnics
	09/IIND-01 Aerospace and naval engineering	AGRI-02/B Horticulture and floriculture
	11/PAED-01 Pedagogy and history of education	AGRI-09/B Animal nutrition and feeding
	11/PSIC-01 General psychology	IIND-01/A Naval architecture
	11/PSIC-03 Social psychology	PAED-01/B History of education
	12/GIUR-01 Private law	PSIC-01/A General psychology
	12/GIUR-02 Commercial law	PSIC-03/B Psychology of labour
	12/GIUR-11 Comparative law	GIUR-01/A Private law
	12/GIUR-12 Civil procedural law	GIUR-02/B Navigation law
	13/STAT-03 Demography and social statistics	GIUR-11/A Comparative private law
14/GSPS-05 General sociology	GIUR-12/A Civil procedural law	
14/GSPS-06 Sociology of cultural processes	STAT-03/B Social statistics	
	GSPS-05/A General sociology	
	GSPS-06/A Sociology of cultural processes	
Physical training or education or exercise	06/MEDS-19 Diseases of the musculoskeletal system	MEDS-19/A Diseases of the musculoskeletal system
	09/IIND-04 Processing technologies and systems	IIND-04/A Processing technologies and systems
	05/BIOS-10 Cellular and applied biology	BIOS-10/A Cellular and applied biology
	05/BIOS-12 Human anatomy	BIOS-12/A Human anatomy
	11/PAED-02 Methodologies of teaching, special education and educational research	PAED-02/A Methodologies of teaching and special education
	06/MEDS-26 Technical sciences of laboratory medicine, science of health professions diagnostic techniques	MEDS-26/C Rehabilitation health professions sciences
11/PSIC-01 General psychology, neuropsychology and cognitive neuroscience, psychometrics	PSIC-01/A General psychology	

development of “theories, methods, and techniques for physical education and sports activities in school age,” as well as “youth and school sports initiation” and “the practice of different sports disciplines.” Furthermore, it addresses the “promotion of active lifestyles,” the “assessment of motor and sports skills,” and the programming of “adapted physical activities for well-being and health throughout life.” This overlap underscores the need for a clearer delineation of the respective disciplinary competences to avoid ambiguities and redundancies.

The detailed analysis of keywords related to ARF and AD concerning the DMs of 2000 and 2015 highlights that the keyword “Sport” appears in 15 ARFs, covering physiology (05/D1), biochemistry (05/E3), pharmacology (05/G1), human anatomy (05/H1), general pathology (06/A2), endocrinology (06/D2), musculoskeletal diseases (06/F4), and medical imaging diagnostics (06/I1). Also included are bioengineering (09/G2), Didactics, special pedagogy and educational research (11/D2), general and social psychology (11/E1 and 11/E3), administrative law (12/D1), demography, and social statistics (13/D3). In the AD category for “Sport”, there are 10 ADs listed, including physiology (BIO/09),

biochemistry (BIO/10), clinical pathology (MED/05), internal medicine (MED/09), musculoskeletal diseases (MED/33), imaging and radiotherapy (MED/36), electronic and informatics bioengineering (ING-INF/06). Additionally included are psychobiology (M-PSI/02), occupational psychology (M-PSI/06), and social statistics (SECS-S/05).

For the keyword “Physical training or education or exercise” in the ARF category, 13 ARFs have been identified. These include musculoskeletal diseases(06/F4), general pediatrics (06/G1), clinical biochemistry and molecular biology (05/E3), human anatomy (05/H1), special education and pedagogy (11/D2), general psychology (11/E1), zoology and anthropology (05/B1), applied biology (05/F1), general pathology (06/A2), cardio-respiratory diseases (06/D1), health professions sciences (06/N1), blood diseases (06/D3) and applied mechanics of machines (09/A2). In the AD category for the keyword “Physical training or education or exercise”, there are 9 ADs listed, including physical and rehabilitative medicine (MED/34), biochemistry (BIO/10), clinical biochemistry (BIO/12), human anatomy (BIO/16), cardio-respiratory diseases (MED/11),

**Table 5** Keyword analysis in Annex B of DM n. 855 of 30 October 2015 [4], and Annex B of DM of 4 October 2000 [1]

Keyword	Academic recruitment field	Academic discipline
Sport	05/D1 Physiology	BIO/09 Physiology
	05/E3 Clinical biochemistry and molecular biology	BIO/10 Biochemistry
	05/G1 Pharmacology	MED/05 Clinical pathology
	05/H1 Human anatomy	MED/09 Internal medicine
	05/H2 Histology	MED/33 Orthopaedics
	06/A2 Experimental medicine	MED/36 Imaging and radiotherapy
	06/D2 Endocrinology, nephrology, food and wellness science	ING-INF/06 Electronic and informatics bioengineering
	06/F4 Orthopaedics and rehabilitation medicine	M-PSI/02—Psychobiology
	06/I1 Imaging, radiotherapy and neuroradiology	M-PSI/06 Work and organizational psychology
	06/N2 Physical training and sports sciences	SECS-S/05 Social statistics
	09/G2 Bioengineering	
	11/E1 General psychology	
	11/E3 Social psychology and work	
	12/D1 Administrative law	
	13/D3 Demography and social statistics	
Physical training or education or exercise	06/F4 Orthopaedics and rehabilitation medicine	MED/34 Physical and rehabilitation medicine
	06/G1: Paediatrics and child neuropsychiatry	BIO/10 Biochemistry
	05/E3: Clinical biochemistry and molecular biology	BIO/12 Clinical biochemistry
	05/H1: Human anatomy	BIO/16 Human anatomy
	11/D2: Didactics, special pedagogy and educational research	MED/11 Diseases of the cardiovascular system
	11/E1: General psychology, psychobiology	MED/13 Endocrinology
	05/B1: Zoology and anthropology	MED/38 Paediatrics
	05/F1: Applied biology	M-PSI/02 Psychobiology and physiological psychology
	06/A2: General pathology and clinical pathology	MED/48 Nursing sciences
	06/D1: Diseases of the cardio and respiratory system	
	06/N1: Health professions sciences	
	06/D3: Blood diseases, oncology and rheumatology	
	09/A2: Applied mechanics of machines	

endocrinology (MED/13), pediatrics (MED/38), psychobiology (M-PSI/02), and nursing sciences (MED/48).

Such overlaps found within the scientific declarations could lead to confusion and reduce the effectiveness of research and training activities, thus hindering scientific and cultural progress in these fields [14–16]. Further investigation into the specific implications of these minimal overlaps, like what was conducted for congruent overlaps in SDG of 11/PAED-02, is likely necessary.

## Conclusion

The overlaps between the scientific declarations of SDGs and updated ADs were supposed to decrease due to a clearer definition of scientific, cultural, and educational areas. However, instead of decreasing, these overlaps have increased. Of particular concern is the declaration of SDGs in Area 11 of Historical, philosophical, pedagogical, and psychological sciences. In this area, there is a significant overlap between the SDG of Educational research, teaching, special pedagogy and experimental pedagogy (code 11/PAED-02) and that of Physical Exercise and Sport Sciences (06/MEDF-01). Such overlap could lead to confusion and reduce the effectiveness of research and

educational activities, thereby hindering scientific and cultural progress in these two SDGs.

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**Data availability** No datasets were generated or analysed during the current study.

## Declarations

**Conflict of interest** The authors declare no competing interests.

**Ethical Approval** This article does not contain any studies with human participants or animals performed by any of the authors.

**Informed Consent** For this type of study, formal consent is not required.

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