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Original Article

MOOCs and the Professional Development of Public Servants in Brazilian HEIs: Towards a Unified Search and Analysis Platform for Online Courses

MOOCs no Desenvolvimento de Servidores Públicos nas IFES: uma Plataforma para Busca e Análise Unificada de Cursos Online

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Abstract

Massive Open Online Courses (MOOCs) have been offered by universities worldwide for over a decade to broaden access to higher education. In Brazil, MOOCs are available through government platforms as well as Higher Education Institutions (HEIs). This study aimed to examine the current landscape of MOOCs offered by HEIs, in light of the growing demand for continuing professional development in public administration. The research is descriptive in nature, combining quantitative and qualitative approaches, and based on a documentary review of institutional platforms. In addition, the study employed the Design Science Research (DSR) methodology to develop a dashboard that consolidates and displays the data collected. The survey identified 846 MOOCs hosted on 26 platforms, including 15 maintained by federal universities and 11 by federal institutes. The results show a clear expansion of MOOC provision compared to previous studies, with federal institutes assuming a leading role by concentrating the largest share of courses (56.1% of total) and the highest average workload: 44.7 hours per course, compared to 23.4 hours per course at universities. The analysis also highlights the breadth of themes covered, ranging from formal education content to professional training across multiple fields of knowledge. Despite this progress, two critical challenges remain: the absence of standardized course information and the difficulty of locating platforms online, even when supported by advanced search tools. These issues limit the visibility and potential impact of MOOCs. The study concludes that MOOCs developed by HEIs have strategic value for university outreach and for strengthening professional development in the public sector, while underscoring the need for technological solutions that enable unified access and broader dissemination of this knowledge.

Keywords: Online Learning. Universities. Federal Institutes. Survey. Platforms.

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MOOCs no Desenvolvimento de Servidores Públicos nas IFES: uma Plataforma para Busca e Análise Unificada de Cursos Online

Resumo

Há mais de uma década, universidades de diferentes países oferecem cursos online abertos massivos (MOOCs) como estratégia de democratização do ensino superior. No Brasil, esses cursos são encontrados em plataformas governamentais e também oferecidos por Instituições Federais de Ensino Superior (IFES). Este estudo analisa a oferta de MOOCs por IFES em meio à crescente demanda por desenvolvimento profissional continuado na administração pública federal. Trata-se de um estudo descritivo, de abordagem mista, baseado em levantamento documental em plataformas digitais. Também foi aplicada a metodologia Design Science Research (DSR) no desenvolvimento de um painel interativo para apresentação das informações coletadas. O levantamento identificou 846 cursos distribuídos em 26 plataformas: 15 de universidades e 11 de institutos federais. Os resultados revelam a expansão da oferta em relação a estudos anteriores, com destaque para os institutos federais, que concentram o maior volume de cursos (56,1% do total) e a maior carga horária média: 44,7 horas/curso frente às 23,4 horas/curso nas universidades. Identificou-se também uma diversidade de temáticas nos MOOCs oferecidos, abrangendo tanto conteúdos de educação formal quanto de qualificação profissional em diversas áreas do conhecimento. Por outro lado, observou-se a ausência de padronização das informações e a dificuldade de localização das plataformas, fatores que comprometem o acesso aos cursos. Conclui-se que os MOOCs das IFES possuem potencial estratégico para a extensão universitária e para o desenvolvimento profissional de servidores públicos. Recomenda-se, portanto, o desenvolvimento de soluções que favoreçam a localização e a análise unificada de cursos das diversas plataformas, contribuindo ainda mais para a democratização do conhecimento.

Palavras-chave: *Educação a distância. Universidades. Institutos Federais. Mapeamento. Plataformas.*

1. Introduction

The continuous development of people is one of the key factors in improving the services provided by organizations (Senge, 2013). In the public sector, this is no different, where the pursuit of improvement is driven by the constant demand for quality public services (Caminha; Milagres, 2023). In Brazil, since the 1990s, successive policies have sought to modernize public administration and enhance the skills of its civil servants, particularly since 2006, with the introduction of competency-based management (Rodrigues, 2024). In 2019, this trajectory was consolidated in the current National Policy for Human Resources Development (PNDP), which reaffirms the importance of competency development for excellence in federal public administration (Brazil, 2019, Art. 1).

During this same period, while the public sector sought to improve the performance of its civil servants, the field of education witnessed the emergence and expansion of something that would bring new perspectives to distance learning: Massive Open Online Courses (MOOCs). As a result of initiatives by the Massachusetts Institute of Technology (MIT), Stanford University, and the University of Manitoba in Canada (Gonçalves *et al*., 2015; Mendonça & Alves, 2024; Pereira, 2024), MOOCs emerged with the goal of providing free education, open to all and accessible from anywhere (Papadakis, 2023; Shah, 2021). In general, these courses share characteristics such as being free of charge, short in duration, permanently available, and capable of accommodating a large number of participants (Mendonça; Alves, 2024). With these features, MOOCs quickly gained popularity, and by the end of 2012, they already had more than 2 million students across various platforms (Shah, 2020). Considered an evolution of traditional distance learning (Siemens, 2013), MOOCs have brought a new perspective to education by expanding possibilities for scale and allowing "[…] the breaking of the limitations of time and space in learning" (Bianchi *et al.,* 2022, p. 60), thereby also sparking interest in the organizational sphere, in both the public and private sectors (Gasque *et al*., 2020; Mendonça & Alves, 2024). Thus, MOOCs demonstrate their strategic potential for the continuous professional development of federal civil

servants, especially given the frequent difficulty of participating in in-person courses due to transportation challenges, scheduling conflicts, or work demands (Santos, 2023; Teixeira, 2022).

However, despite their rapid rise abroad, in Brazil MOOCs have advanced at a pace and "[...] in an environment distinct from the educational landscape of other countries, particularly developed countries." (Ribeiro; Catapan, 2018, p. 46). While in the United States the provision of MOOCs has been concentrated on large, unified platforms, in Brazil a decentralized model has prevailed, with isolated initiatives by universities and public agencies (Ribeiro; Catapan, 2018). In this fragmented landscape, Teixeira and Pontes (2017) point to technological and methodological gaps in corporate education within the public sector. To address this reality, the Virtual School of Government (EVG) was created, inspired by the U.S. model and supported by the National Policy for Personnel Development (Brazil, 2006), with the aim of unifying distance learning courses for public servants (Teixeira; Pontes, 2017). Administered by the National School of Public Administration (ENAP), the EVG currently offers more than 800 courses open to civil servants and the general public (ENAP, 2025b). However, even after the creation of EVG, studies indicate that public institutions continue to offer MOOCs (Bottentuit Junior *et al.,* 2020; Gasque *et al.,* 2020; Horst *et al*., 2022), particularly universities, where Bianchi *et al.* (2022) highlight the fragmentation of this offering. This contradiction—between the centralization sought by public policy and the autonomy maintained by institutions in offering online extension courses—constitutes the central focus of this research.

In this context, this study seeks to answer the following question: What is the current landscape of MOOC offerings by Federal Institutions of Higher Education (IFES) amid the demand for continuing professional development in the federal public administration? To this end, the study updates the overview provided by Bianchi *et al*. (2022), which focused on federal universities, and expands its scope to include federal institutes of technological education, since they are treated as equivalent to universities under Law No. 11,892 (Brazil, 2008). The study also includes the development of an interactive dashboard for analyzing the collected data and identifying the courses offered to the public.

From a scientific perspective, this study contributes to updating the empirical foundation of previous studies (Bianchi *et al*., 2022; Gomes & Souza, 2025) on MOOCs offered by higher education institutions. The study also makes a contribution by applying the Design Science Research (DSR) methodology to the development of an artifact—the interactive dashboard—which enables unified access to a range of courses scattered across multiple platforms, bringing together information that can support civil servants, managers, researchers, and others interested in professional development in the public sector.

2. Methodological Procedures

This is a descriptive study with a mixed-methods approach, based on a literature review conducted on digital platforms. Initially, to establish a basis for comparison, the study identified which platforms mapped by Bianchi *et al.* (2022) remained active. Next, a new survey was conducted covering all Brazilian higher education institutions (IFES). Data collection took place in two stages: in the first stage, between April and May 2025, distance learning platforms were identified; in the second stage, between May and June 2025, the MOOCs available on each platform were recorded. Finally, between June and July 2025, the data were analyzed and organized, resulting in the creation of a dashboard to present the updated landscape.

2.1. Data Collection

The first stage focused on identifying platforms among the 110 higher education institutions accredited by the MEC (Brazil, 2025b), including 69 federal universities, 39 federal institutes, and 2 federal centers for technological education. For each institution, three approaches were adopted: (1) manual research on official websites; (2) Google searches using the institution's name or acronym combined with terms such as "MOOC," "open courses," and "LMS"; and (3) use of the Generative Artificial Intelligence (GAI) models ChatGPT

and Gemini, instructed to perform tasks aligned with the previous searches. The platforms identified were recorded in a spreadsheet and categorized according to the type of course offered—internal, open to the public, or both—which served as the basis for the next stage.

In the second stage, the courses offered to the public on the identified platforms were mapped. Only free courses that offered a certificate and did not require institutional affiliation were considered. Given the diversity of platforms, manual data collection was combined with supervised data extraction using the same IAG models, applied to platforms with more than 20 courses.

The survey confirmed that the situation described by Bianchi *et al.* (2022) – characterized by a lack of standardization and difficulty accessing basic information—persists. In many cases, data such as course load or course description were missing even after enrollment in the course. For courses that did not include a description field, summary descriptions were prepared based on information obtained from their course pages; the remaining missing fields were recorded as "not reported." Categories and classifications were retained exactly as presented, in order to reflect the heterogeneity of the platforms.

2.2. Dada Analysis

Once data collection was complete, the data were processed and analyzed between June and July 2025 using a mixed-methods approach. Descriptive statistics were applied to calculate frequencies and characterize the course offerings. At the same time, an interpretive qualitative analysis of the information presented by the platforms was conducted to verify its consistency and observe the dynamics of course offerings, whether seasonal or permanent.

2.2. Development of an Interactive Panel

To present the results, an interactive dashboard-style panel was developed. The panel's design followed the Design Science Research (DSR) methodology, which guides the design, construction, and evaluation of artifacts intended to solve specific problems (Hevner *et al.,* 2004). This approach has proven suitable for the development of analytical dashboards (Amirasari; Andrias, 2024; Gledson *et al*., 2024; Vendrúscolo, 2020). In this study, the process involved the three initial phases of the DSR cycle: problem identification, solution design, and artifact development. The dashboard developed is the primary tool for presenting the scenario identified in 2025, enabling the analysis and interactive exploration of the collected data.

3. Results

The data collected point to significant changes in the landscape observed in 2020 by Bianchi *et al*. (2022). A reconfiguration of public platforms was identified: of the six mapped in the previous study, only three remained active. In contrast, the remaining platforms experienced significant expansion, notably PoCA (UFSCar), whose catalog grew by 412.5%, and Lúmina (UFRGS), which expanded its offerings by 137.8%. Thus, although the number of platforms has been cut in half, the total number of courses open to the public has nearly doubled due to the expansion of the remaining platforms. Table 1 presents the details of this trend.

Table 1 – Comparison of Course Platforms (2020 e 2025)

University	Platform	2020		2025	
		No. Courses	Hours	No. Courses	Hours
UFSCar	PoCA	24	224	123 (+ 412,5%)	1656 (+ 639,3%)
UFRGS	Lúmina	37	1005	88 (+ 137,8%)	1974 (+ 96,4%)
UFRB	AVA ACADÊMICO	9	397	15 (+ 66,7%)	594 (+ 49,6%)
UNB	Escola do Trabalhador	38	1520	desativada	desativada
UFU	UAITEC	5	140	desativada	desativada
UNIFESP	UNA-SUS Unifesp	4	240	desativada	desativada
TOTAL		**117**	**3526**	**226** (+ 93,2%)	**4224** (+ 19,8%)

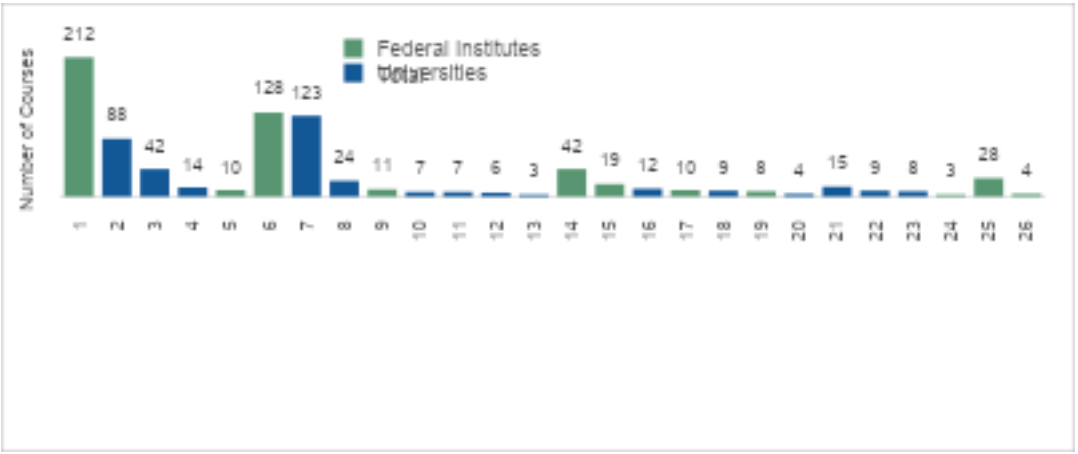
Source: adapted by Bianchi *et al.* (2022, p. 63)

In addition to the expansion of the three remaining platforms, 23 platforms not included in the previous study were identified: 12 from universities and 11 from federal institutes, which were not part of the previous scope. Thus, a total of 26 online platforms offering courses open to the public in 2025 were identified, with 15 affiliated with universities and 11 with federal institutes. Together, these platforms offer 846 courses, a number seven times greater than that recorded in the study by Bianchi *et al.* (2022). A detailed analysis of this scenario is presented below.

3.1. Overview of Course Offerings

An analysis of the number of platforms and the MOOCs they offer reveals an uneven distribution across the country's different regions, as shown in Figure 1.

Figure 1 – Number of MOOCs on platforms maintained by IFES grouped by geographic region (2025)



Source: written by the auhors.

The data in Figure 1 reveal disparities in the courses offered by higher education institutions (IFES), both in terms of the geographic distribution of campuses and the number of courses offered. There is a greater concentration of platforms in the South, Southeast, and Midwest regions, with the Southeast being the most significant region in this regard, with eight platforms. However, while the Southeast has more platforms, the South offers the largest number of courses: 366, accounting for 43.3% of the total offerings.

In terms of the number of courses, four institutions stand out: the Federal Institute of Rio Grande do Sul (IFRS), the Federal Institute of Espírito Santo (IFES), the Federal University of São Carlos (UFSCar), and the

Federal University of Rio Grande do Sul (UFRGS). Together, they offer 551 courses open to the public, accounting for 65.1% of the total offerings. The IFRS platform stands out for having the largest catalog among the institutions, with 212 courses—more than five times the overall average of 32.5 courses per platform.

Another important aspect is the participation of federal institutes, which were not included in the previous study. In the current survey, they account for 475 courses (56.1% of the total). The two platforms with the highest number of courses also belong to this network and, together, account for 340 courses, equivalent to 40.2% of all courses mapped. The significance of these institutes becomes even more evident when analyzing the course load of their programs. On average, the institutes offer 44.7 hours per course, nearly double that of universities, which average 23.4 hours. Together, the 11 institutes offer 21,256 course hours, compared to 8,678 hours from the 15 universities. This high figure stems largely from IFRS, whose catalog includes 39 200-hour courses, totaling 7,800 hours—a number close to the combined total of all the universities.

In summary, federal institutions, although they have fewer campuses, offer a greater number of courses with a higher average course load than universities. Table 1 details these indicators.

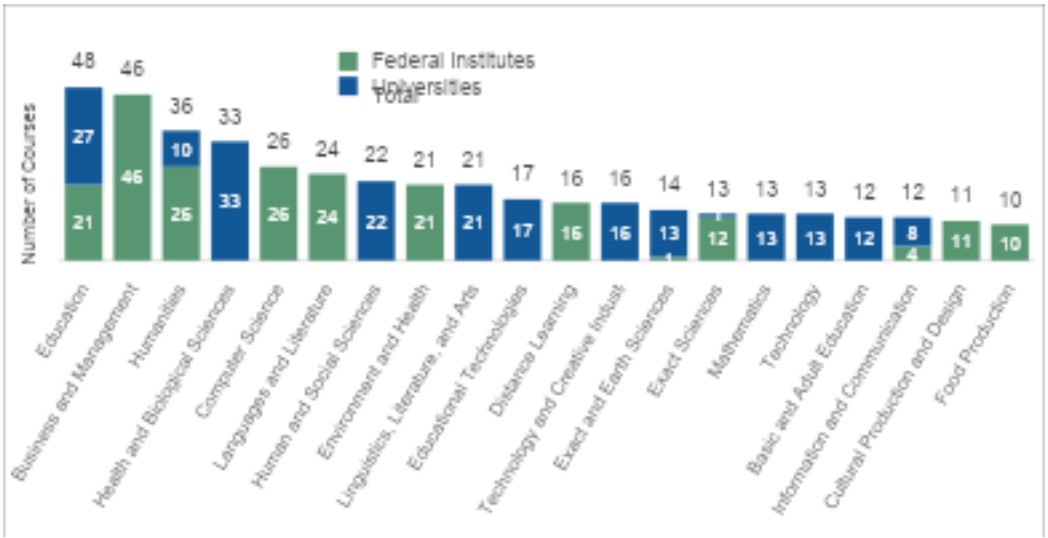
Table 1 – Comparison of Course Offerings by Type of Institution (2025)

Indicators	General	Universities	Federal Institutes
Number of platforms	26	15	11
Number of courses	846	371	475
Number of courses per platform	32,5	24,7	43,2
Total course hours	29.934 h	8.678 h	21.256 h
Average course load per course	35,4 h	23,4 h	44,7 h

Source: written by the auhors.

As for fields of study, 65 distinct categories were identified, with “Education” being the most common —when courses from universities and institutes are combined. Among universities, the field of “Health and Biological Sciences” stands out; among institutes, it is “Management and Business.” Figure 2 shows the 20 most frequently used categories on the platforms.

Figure 2 – Categories Most Commonly Used by Platforms (2025)



Source: written by the auhors.

Several of the categories used overlap with one another, such as “Education,” “Distance Learning,” and “Technologies in Education,” or “Humanities” and “Humanities and Social Sciences.” More than just a variety of

topics, this diversity of categories reveals the heterogeneity in how platforms handle information. In some cases, the categories take on an administrative nature, being used to group courses into “open classes,” “new offerings,” or “closed courses,” for example. This lack of uniformity is also evident in other course information, such as course objectives, target audience, and syllabus. Of the 846 courses mapped, only 309 provide a significant portion of this information — albeit in an unstructured manner — while 339 do not specify a target audience, 253 lack a defined category, 75 do not include a description, 53 do not specify the course load, and 22 do not provide any of this information.

Different practices were also observed regarding how long courses remain on the platforms—both in terms of whether they are offered year-round or seasonally, and in terms of how this is communicated to users. On some platforms, this information appears in the course title itself, with additions such as “2025 Edition,” “Class 2025A,” or “Extra Class.” On others, it is indicated in the “category” field, which, instead of specifying the subject matter, groups active courses with those from closed classes. A variety of practices was also observed in the types of courses offered. Of the 26 institutions analyzed, 12 (46.1%) maintain platforms exclusively for courses open to the public, including six universities and six federal institutes. On the other hand, 14 (53.8%) combine open courses and internal courses on their platforms, including nine universities and five federal institutes.

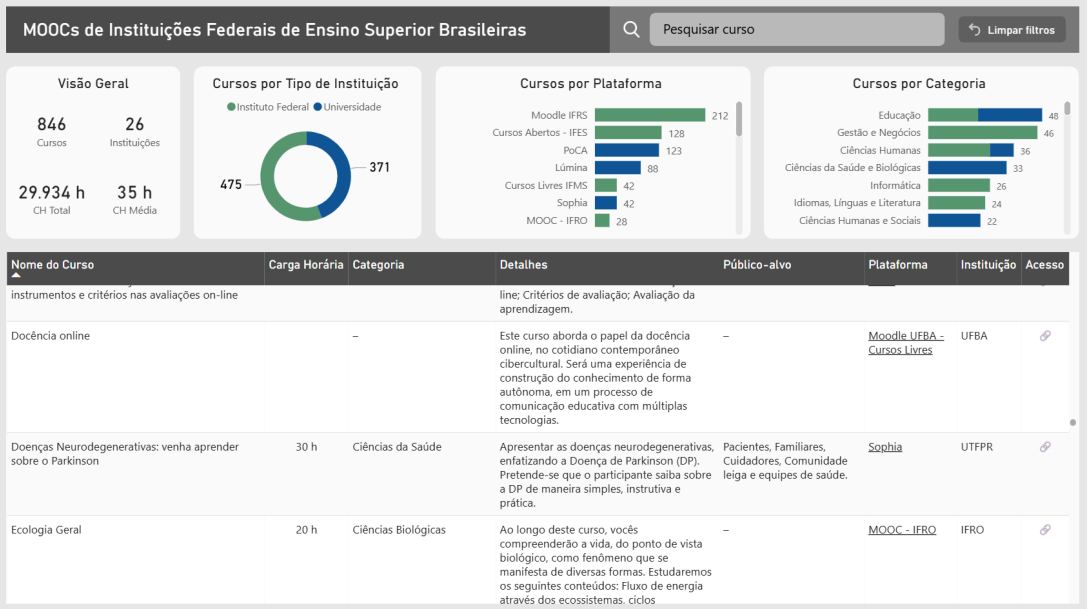
Despite the diversity of practices among institutions, a common feature is evident across most platforms: the prevalence of courses focused on formal education, such as “Introduction to Algorithms and Programming Logic” and “Introduction to Electrical Engineering.” This type of course reflects a practice that has been valued since the inception of MOOCs and is aligned with university extension policies: the democratization of knowledge that was previously restricted to universities.

Given the diversity of practices adopted by institutions, with information presented in a scattered and inconsistent manner across platforms, we chose to consolidate the collected data into a unified dashboard in order to present it in a centralized and, to the extent possible, more uniform manner.

3.2. Interactive Data Dashboard

As part of the study, an interactive data dashboard was developed to present the scenario identified for 2025. The dashboard allows users to explore the collected data and locate courses and platforms offered by the institutions surveyed. Figure 1 shows the dashboard, which includes the complete list of mapped courses along with their respective quantitative indicators.

Figure 1 – *Dashboard showing an overview of courses identified in 2025*



Source: Available at https://rebrand.ly/moocs-ifes. Accessed on: Sept. 22, 2025.

The dashboard allows you to search for courses simultaneously by name, course load, category, description, target audience, platform, and institution, as well as filter information using the charts provided.

Thus, the tool achieves its goal of presenting, in a centralized and interactive manner, the landscape of MOOC offerings by Brazilian higher education institutions in 2025, while also enabling a unified search across more than 800 courses distributed across 26 different platforms.

4. Results

The expansion of the MOOC offering observed in this study points to the strengthening of this format within the Brazilian educational context. The advancement of university platforms, combined with the leading role played by federal institutes, reveals the potential of these institutions in the face of growing demand for online courses. This demand has intensified since the COVID-19 pandemic, both internationally (Shah, 2021) and in Brazil, as evidenced by access indicators for some national platforms (Brazil, 2025a; ENAP, 2025a).

The MOOC offerings from Brazilian higher education institutions reveal a diversity of topics and approaches on platforms spread throughout the country, although they are most concentrated in the South and Southeast regions. The courses range from vocational training for youth and adults to the development of skills for public servants, as well as topics of interest to society at large, reaffirming the original purpose of MOOCs: free education for all (Pereira, 2024; Shah, 2021).

However, the multiplicity of platforms, while expanding educational opportunities, perpetuates the scenario described in previous studies (Bianchi *et al*., 2022; Ribeiro & Catapan, 2018; Teixeira & Pontes, 2017), characterized by scattered initiatives that make it difficult to locate these platforms. Even researchers face this difficulty: a survey published by Gomes and Souza (2025) as this article was being finalized identified five IFES platforms — offering more than 140 courses in total—that were not identified in this study, even with the aid of artificial intelligence. This episode does not invalidate the results presented here; on the contrary, it reinforces the fact that, although MOOCs are technically available, the difficulty in locating the platforms limits their actual reach.

The autonomy of IFES, which enables them to offer courses tailored to specific contexts, results in the lack of standardization of information highlighted in the findings of this study. This situation makes it difficult to

compare MOOCs and poses an obstacle to interoperability between platforms, as noted in studies in this field (Galizina *et al*., 2021; Staubitz *et al*., 2023). In this context, Staubitz *et al*. (2023) suggest the use of standardized metadata to unify essential information from various MOOCs, while allowing platforms to organize their courses freely. In the context of IFES, adopting a similar approach would allow for the consolidation of key data from all MOOCs in a single location, enabling integrated searches without requiring courses to be hosted entirely on a centralized platform — a requirement that could limit the autonomy and innovation of some institutions.

In this regard, we reiterate the observation made by Bianchi *et al.* (2022) regarding the importance of a technological tool that consolidates information on MOOCs from various Brazilian higher education institutions. A solution in line with the goal of "centralizing what can be centralized [...] without hindering the decentralization of what should remain decentralized" (Teixeira; Pontes, 2017, p. 8), thereby increasing the visibility and utilization of the knowledge produced by public institutions.

5. Final Considerations

By eliminating geographic and time-related restrictions, MOOCs offer a format capable of expanding opportunities for academic and professional education. In Brazil, the MOOCs offered by Federal Institutions of Higher Education (IFES) represent a significant contribution to education and professional development in various fields of knowledge. Many courses offered by IFES cover topics and approaches specific to the context of these institutions, providing additional opportunities for professional development beyond those already offered by centralized government platforms.

This study analyzed the availability of MOOCs offered by Brazilian higher education institutions (IFES) amid the growing demand for continuing professional development in the federal public administration. The 2020 landscape (Bianchi *et al.,* 2022) was compared with a new survey conducted in 2025, resulting in the creation of an interactive dashboard to present the collected data. The dashboard enables comparative analyses by managers and researchers, in addition to facilitating the identification of professional development opportunities for public servants and society at large.

The study revealed the expansion of university platforms and highlighted the leading role of federal institutes, which—despite having the smallest number of platforms (42.3%)—account for the majority of courses (56.1%), with an average course load of 44.7 hours per course—nearly twice the 23.4 hours per course at universities. A diversity of topics was also observed in the MOOCs offered, ranging from formal education content to professional training in areas such as Education, Health, and Management. On the other hand, it was found that the lack of standardized information makes it difficult to compare courses and even locate the platforms themselves, thereby limiting their reach among the public.

Despite the challenges identified, the range of available platforms represents a strategic opportunity both for the continuing education of public servants and for enhancing university extension programs, especially given the budgetary and logistical constraints inherent in in-person courses.

From a scientific perspective, this study contributes to updating the overview of MOOC offerings observed in previous studies (Bianchi *et al*., 2022; Gomes & Souza, 2025), providing a more in-depth analysis of the practices employed by the higher education institutions offering these courses, particularly with regard to how the information provided is handled. The study also contributes by building on the experiments initiated by Bianchi *et al*. (2022), particularly by proposing an interactive dashboard as a tool capable of aggregating information from the various courses available on multiple platforms. In addition to enabling a centralized search for the various available courses, this type of tool also serves as a data source for research, as noted by Cisel (2019), Galizina *et al.* (2021), and Tatang and Algarni (2023).

In addition to providing an updated overview of the national landscape of MOOC offerings, the study expands on previous research by incorporating federal institutes into its analytical scope, highlighting their

leading role in offering online courses and their potential to support lifelong learning, continuing education, and professional development. The study also contributes by identifying limitations related to the lack of standardization of information and the heterogeneity of the metadata provided by the platforms—aspects that directly impact the visibility, integration, and use of courses within digital educational ecosystems.

It should be noted that the study was limited to MOOCs offered by IFES, open to the public and offering free certificates, during the period from May to July 2025, and did not include courses launched after that date. Aspects related to the pedagogical quality or effectiveness of the courses were not addressed. For future studies, it is recommended to extend the mapping to state universities and government platforms—such as AVAMEC and Aprenda Mais, from the Ministry of Education, and AVASUS and Portal UNA-SUS, from the Ministry of Health. It is also suggested to conduct more in-depth qualitative analyses, with the aim of standardizing the classification of courses by fields of knowledge and exploring new possibilities for categorization.

Finally, the diversity of platforms and the heterogeneity of the information available underscore the need for technological tools that can unify this information. Solutions such as indexing portals, intelligent recommendation systems, or virtual assistants based on generative artificial intelligence could provide centralized and personalized search capabilities, recommend courses based on users' profiles and educational goals, and support the creation of learning paths. These mechanisms have the potential to significantly expand the visibility, access, and utilization of MOOCs offered by higher education institutions, thereby strengthening strategies for lifelong learning, continuing education for public servants, supplementary training for students, and the democratization of knowledge.

Declaration on the Use of Artificial Intelligence:

This article used ChatGPT and Gemini to assist with: verified data extraction, spell-checking, grammatical refinement, and the organization of academic writing. These tools were not used to generate data, conduct analyses, or produce scientific results. The authors remain fully responsible for the content and scientific integrity of this work, in accordance with CNPq Ordinance No. 2,664/2026.

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He supervised the master's thesis and was responsible for drafting and revising this article.

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