



## Digital Empowerment of Information Resources Through Digital Entities in Academic Settings

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**SEGHIRI Miloud**

Faculty of human sciences and social  
University of Mohamed Khider- Biskra, Algeria

[miloud.seghiri@univ-biskra.dz](mailto:miloud.seghiri@univ-biskra.dz)

**Résumé :** Cette étude est consacrée à l'examen du rôle des entités numériques dans l'empowerment numérique au sein des environnements académiques, contribuant ainsi à l'amélioration significative de la qualité et de l'efficacité interactionnelle de ces plateformes. Ces entités agissent en tant que catalyseurs essentiels pour renforcer l'empowerment numérique de la communauté universitaire, en facilitant un accès accru aux ressources d'information. Elles proposent une interface dynamique qui permet l'accès au contenu numérique et aux services indispensables liés aux activités de recherche et aux résultats scientifiques, améliorant par là même les canaux de communication avec les entités numériques. Cette optimisation contribue substantiellement à l'amélioration de la production scientifique disponible et à l'expansion des opportunités éducatives ainsi que des services offerts.

**Mots-clés :** Empowerment numérique, entités numériques, ressources informationnelles, environnement académique.

### **L'Empowerment Numérique des Ressources Informationnelles via les Entités Numériques dans les Environnements Académiques**

**Abstract :** This study elucidates the role of digital entities in fostering digital empowerment within academic environments, enhancing both the quality and interactive efficiency of these digital platforms. Digital entities act as pivotal mechanisms for augmenting the academic community's digital empowerment, facilitating enhanced access to information resources. These platforms provide a dynamic interface for accessing digital content and essential services related to scientific activities and outputs, thereby improving communication channels with digital entities. This enhancement significantly contributes to the optimization of available scientific production and the advancement of educational opportunities and services.

**Keywords :** Empowerment, Digital Empowerment, Digital Entities, Information Resources, Academic Setting.

## **Introduction :**

In the context of substantial advancements in contemporary technology, digital entities have emerged as crucial in promoting digital empowerment among users and information institutions within academic settings. These entities establish an effective digital interface linking them with the academic community and are integral sources of information and service provision. This research aims to underscore the role of digital entities in bolstering digital empowerment and elevating the performance of these entities to meet the evolving needs and aspirations of the academic community.

### *1.1. Statement of the Problem:*

The development and availability of digital entities, such as digital repositories, portals, and educational platforms in academic environments, are essential components of the academic research and educational ecosystem. The academic community is characterized by its diverse activities, interests, and informational needs across various digital formats, including books, scholarly journals, grey literature, and bibliographies. This diversity necessitates multifaceted interactions with available digital entities, prompting the central research question: What are the channels and methods of digital empowerment of information resources through digital entities in academic settings? To address this question, the study will explore several sub-questions:

- What constitutes digital empowerment of information resources through digital entities?
- What forms do digital entities take within the Algerian academic setting?
- What are the channels of digital empowerment of information resources through digital entities?
- What methods and strategies are employed to safeguard information accessible through digital entities?
- What are the prevailing challenges associated with the use of digital entities?

### *1.2. Significance of the Study:*

This study is pivotal as it analyzes the utilization of digital entities by the academic community, significantly contributing to the empowerment of this community and aiding in the development of strategies for scientific research and academic training. Enhancing access to information resources and expediting the acquisition of educational and research materials are central to this empowerment. Moreover, the academic community's engagement with digital entities facilitates a more effective exchange of information and expertise, enhancing academic experiences. This interaction also generates valuable data that support the development of university policies and practices, aiding in

decision-making processes related to improving digital infrastructure and resource allocation.

### *1.3. Objectives of the Study:*

This study aims to:

- Understand the nature and role of digital entities in enhancing interaction and digital empowerment of information resources within the academic community and information institutions.
- Identify the types of digital entities available in the Algerian academic setting and assess their responsiveness to the community's needs.
- Explore the channels of interaction and digital empowerment between the academic community and digital entities.
- Determine methods for protecting information made available through digital data.

### *1.4. Literature Review:*

The study by Ben Tazir Meriem (2022) on the preservation of digital entities within Algerian digitization projects in documentation institutions aims to underscore the importance of preserving digital entities to prevent their loss and ensure their future usability. Utilizing a descriptive research methodology, Ben Tazir conducted field studies and deployed surveys as a primary data collection tool, with data analysis facilitated through the SPSS software to test the hypotheses. The findings indicate that the success of digitization projects hinges on the readiness of human resources, technological infrastructure, and the availability of financial support (Ben Tazir, 2022). This research aligns with the current study in focusing on the impact of digital entities on information accessibility.

Another pertinent study by Moussaoui Lilia and Menadeli Mohammed (2021) examines the implementation and resistance to empowerment strategies in public administrations. Data collection was executed through a field study at the National Pedagogical Institute, utilizing the Statistical Package for the Social Sciences (SPSS) to analyze participant responses.

The research identified multiple strategies effective for fostering employee empowerment in public sectors. These strategies include the provision of training and development programs, administrative support, and the promotion of transparency and participatory decision-making processes. The study offered a comprehensive overview of the application of these strategies within human resource management contexts (Moussaoui and Menadeli, 2021, pp. 663-684).

It intersects with the current study concerning the empowerment variable, particularly focusing on digital empowerment's role in facilitating access to information resources within academic settings.

## **2. Conceptual Framework of the Study:**

### *2.1. Digital Entities:*

Digital entities are sophisticated information environments comprising texts, images, audio, and animations. These entities are distinguished by their integrative and diverse nature, consolidating various media under a cohesive framework to provide comprehensive and integrated content that caters to the multifaceted needs of users (Mefdaoui, 2022, p. 937).

### *2.2 Empowerment:*

Empowerment, derived from the root 'to empower,' connotes the enhancement of an individual's ability to perform specific actions. It denotes the process through which individuals are enabled to undertake greater responsibilities via training, confidence building, and emotional support (Rahmin and Kouwashi, 2022, p. 684). Further, it encompasses the fortification and augmentation of an individual's capabilities and cultural engagement, facilitating deeper integration into societal roles through skill development and self-efficacy enhancement (Rahmin and Kouwashi, 2022, p. 685).

### *2.3. Digital Empowerment:*

Digital empowerment involves equipping the academic community with the capacity to establish their objectives and achieve the goals of their institution through the strategic utilization of technological media. This empowerment extends from the initial stages of training and development to the phases of implementation and evaluation, empowering stakeholders to make strategic decisions and devise solutions to challenges encountered (Ben Ahmed et al, 2022, p. 87).

### *2.4. Information Sources:*

Information sources refer to all media, vessels, and conduits through which information is disseminated to its beneficiaries. These sources encompass the material forms of information carriers, such as books, diagrams, and machine-readable data files, effectively serving as repositories that furnish users with required data (Abd El Hadi, 1999, p. 51).

### *2.5. Academic Setting:*

The term 'academia' traces back to the Greek "Ἀκαδημία" (Akademia), originally denoting the school established by Plato in 387 BCE (Seghiri, 2019, p. 60). In contemporary terms, as defined by Larousse, it refers to a public institution of higher education, comprising a collective of colleges governed by a university council (Seghiri, 2019, p. 61).

### **3.Types of Digital Entities:**

Digital entities are categorized based on the type of digital content they contain. This classification encompasses complex entities that integrate two or more types of content, and simple entities, which consist of files logically sequenced and interconnected as part of a cohesive whole, such as web pages.

Presentation entities are those processed by software to generate visual displays including documents, images, and video content for user interaction. Conversely, non-presentation entities refer to those that require processing to yield a variety of potential outputs. Furthermore, digital entities are differentiated into static and dynamic categories. Static entities are converted through software applications while dynamic entities are maintained in a consistent state but may evolve by incorporating additional files over time. Digitally created entities are generated automatically by computer systems using software applications, while digitally converted entities are created as digital replicas of pre-existing analog information carriers (Ben Tazir, 2023, pp. 230-231).

### **4. Standards for the Design, Accessibility, and Protection of Digital Entities:**

As primary conduits for information dissemination, digital entities require rigorous standardization. Several key standards facilitate this:

*4.1. ISO/TR 3242:2022 on Flexible Data Technologies:* This standard focuses on the application of flexible data technologies to assist in the development of both standards and technological infrastructures, providing a unified approach to digital entities. It facilitates the provision of remote administrative and electronic services while ensuring robust data protection (ISO/TR 3242, 2022).

*4.2. ISO/IEC 14496 on Font and Display Designs for Digital Entities:* This standard delineates the data structures for diverse tables and fonts, offering crucial guidance for designers and developers engaged in creating display engines that comply with these standardized frameworks. Its primary goal is to harmonize font types and other visual display elements across digital platforms (ISO/IEC 14496, 2019).

*4.3. ISO/IEC 19086-4:2019 on Cloud-Stored Information Security:* This standard provides detailed guidelines on the security measures and protections necessary for cloud-stored information components, enabling secure and efficient cloud service applications across various platforms. It ensures excellent performance in cloud data storage and offers strategic advice to mitigate anticipated cyber threats (ISO/IEC 19086-4, 2019).

4.4. *ISO/IEC 25022:2016 for Digital Entity Quality Assessment*: This standard specifies quality metrics and introduces a quality model applicable to any computing system. It covers various design metrics such as interface, font type, and aesthetic considerations, and is particularly aligned with open-source systems and intelligent portal technologies (ISO/IEC 25022, 2016).

4.5. *ISO/IEC 27001:2022 for Information Security Management Systems*: This standard outlines the requirements for establishing, implementing, maintaining, and continually improving an information security management system within organizations. It also includes criteria for assessing and managing information security risks tailored to organizational needs (ISO/IEC 27001, 2022).

## 5. Configurations of Digital Entities within the Academic Setting

### 5.1. *Academic Digital Repositories*:

Academic digital repositories serve as essential conduits for the dissemination of scholarly research, encapsulating a crucial function in preserving and disseminating institutional knowledge, particularly scientific contributions. These repositories encompass an array of grey literature including articles, proceedings from academic conferences, books, theses, dissertations, and research reports, among other scholarly productions.

These repositories are robust digital collections dedicated to aggregating, storing, and making accessible the intellectual outputs of individual or multiple academic institutions. Their core mission is to collate and safeguard academic and scientific outputs, thereby facilitating accessibility for both the academic community and other interested stakeholders, ensuring seamless and effective retrieval (Ben Ghaida, 2016, p. 82).

It is widely acknowledged that academic digital repositories, accessible online or hosted on university servers, collect the scientific and research outputs of researchers affiliated with academic institutions. This collection spans multiple disciplines or may be focused on a specific domain, depending on the repository's scope. The process involves either encouraging or mandating faculty members to deposit their works, which are then organized in a manner that enhances their dissemination, retrieval, and utilization by the academic community – authors and readers alike.

These repositories distinguish themselves by supporting multiple digital file formats, including textual documents, videos, images, and educational materials, all managed via advanced content management systems to streamline content curation and enhance the efficacy and efficiency of access (Fouzi, 2011).

Among the most prominent digital repositories in the Algerian academic setting are those associated with the top ten universities as ranked by the latest "Webometrics" index.

**Table 01:** Principal Digital Repositories in the Algerian Academic Environment

University	Repository Link
University of Constantine 01	<a href="#">UMC Repository</a>
University of Science and Technology Houari Boumediene	<a href="#">USTHB Platforms</a>
University of Tlemcen	<a href="#">Tlemcen DSpace</a>
University of Laghouat	<a href="#">Laghouat DSpace</a>
University of Biskra	<a href="#">Biskra Archives</a>
University of Sétif 01	<a href="#">Univ Sétif</a>
University of Guelma	<a href="#">Guelma DSpace</a>
University of Sidi Bel Abbès	<a href="#">Sidi Bel Abbès RDoc</a>
University of Ouargla	<a href="#">Ouargla DSpace</a>
University of Annaba	<a href="#">Annaba Bibliography</a>

**Source :** Compiled by the researchers

5.2. Digital Educational Platforms:

E-learning emerges as a transformative force in the knowledge industry within academic environments, leveraging electronic resources to deliver educational materials beyond conventional classroom boundaries. This educational mode includes various interactive formats such as electronic discussions and online courses (Hejaj and Khamis, 2011, pp. 402-403).

Digital educational platforms are comprised of software solutions that streamline the management of educational processes and enable remote access to learning content. These platforms include Moodle, Google Classroom, and MOOCs, which represent applications of Web 2.0. They facilitate collaborative learning and information exchange in an interactive manner, allowing users to engage in and contribute to virtual communities similar to real-life working groups or teams. The diagram below details the significant digital educational platforms operational within the Algerian academic landscape (Tetbirt, 2022, pp. 47-48).

**Figure 01:** Digital Educational Platforms in the Algerian Academic Setting



**Source:** Compiled by the researchers

### 5.3. Digital Content Portals in the Algerian Academic Setting:

Digital content portals are essential conduits for the interface between researchers and information resources. These platforms are distinguished by their robust content and website management capabilities, along with advanced search and navigation functionalities. Leading academic institutions and informational entities, such as the National Center for Research in Scientific and Technical Communication, have established several notable portals:

- ASJP - The National Portal for Scientific Journals: Initiated in 2018 by Cerist, ASJP is an electronic platform dedicated to the publication of Algerian scientific journals, accessible via [ASJP](#). This platform is designed to assist researchers, both Algerian and international, in disseminating their research through appropriate scientific journals. Researchers can select their preferred journals for publication purposes on this portal (Soultani, 2022, p. 195).

Moreover, ASJP facilitates the regular monitoring and management of the publication processes within its catalogued journals. It aims to elevate these journals by integrating them into global databases, thus increasing their visibility and citation rates, which consequently enhances the impact factors of both the publications and their authors (Soultani, 2022, pp. 196-197).

- PNST - The National Portal for Thesis Notification: PNST operates as a centralized index for theses, incorporating both a catalog and a textual data database, available at [PNST](#) (Seghiri, 2019, p. 59). This portal offers exhaustive access to dissertations and theses, facilitating every stage from thesis proposal to its notification and subsequent publication following viva voces. PNST possesses a significant repository of scholarly investigations, providing access to both bibliographic details and full texts, thereby significantly contributing to the academic enrichment across various disciplines (Seghiri, 2019, p. 59).

**Figure 02:** The Interface of the Portal



Source: Cerist website

## **6. Digital Entity Services:**

Digital entities offer a range of critical and auxiliary services, which can be delineated as follows:

*6.1. Search and Navigation :* Navigation within digital entities involves the precise modeling and automated generation of descriptive metadata tags. A notable application of this functionality involves utilizing metadata associated with journal articles to facilitate thematic or author-centric browsing. Given the extensive volumes of information resources, the search tool must be capable of supporting diverse and effective search enquiries to enhance discoverability and user engagement.

*6.2. Access and Review :* Digital entities provide users the capability to access files for various purposes including reading, printing, and commenting. They also allow for the review of descriptive metadata associated with digital products. It is imperative that the metadata card includes comprehensive links to all bibliographic data to facilitate thorough academic research.

*6.3. Selective Information Dissemination :* Selective information dissemination is crucial in digital platforms, especially for scientific journals due to their periodic publication nature. This service can operate through two main modalities: firstly, by disseminating articles and notifying registered users following publication; secondly, based on specific topics of interest.

*6.4. Personalization Services :* Digital entities customize web services to meet distinct user needs, which can vary significantly among users. They provide concurrent access to the library's catalog and other external library indexes. Moreover, these entities offer inline reference services and facilitate scholarly communication through web browsers. They also enhance and tailor content to foster user interaction and encourage recurring engagements, thereby enriching the user experience.

## **7. Methods of Accessing Digital Entities :**

The imperative for access to digital entities in academic environments addresses educational and scientific requirements, achievable through multiple platforms such as websites, mobile apps, and social media applications. The primary methods for accessing digital entities include :

*7.1. University Websites as Knowledge Exchange Channels :* The establishment of university websites serves as a primary conduit for communication and information dissemination within the academic community. The focus is on the

robust technical construction and content provision of these sites, enabling researchers to access diverse information resources in their respective fields. These resources include both personal and official sources, such as books, journal articles, conference proceedings, and information available through academic institutional sites (Seghiri, 2019, pp. 108-109). The tools for accessing information sources include:

- **Online Public Access Catalogs (OPAC):** These are collections of catalog cards for documents organized according to international standards to facilitate easy access to information resources (Dahman et al., 2012, p. 16).
- **Hyperlinks and Text Utilization:** The use of effective hyperlinks and texts is a potent method for accessing information resources. These links enable access to digital entities interconnected as nodes, allowing for non-linear navigation through the informational content of documents, with the possibility for users to choose their navigational paths (Seghiri, 2019, p. 124).
- **Leveraging Social Networks to Access Digital Entities:** Social networks are web-based platforms or other forms of online communication that facilitate interaction among individuals (Ramadan, 2017, p. 389).

Social networks function as platforms where users can register and interact, sharing messages, links, and multimedia content among registered members (Ramadan, 2017, p. 390).. Sites such as Facebook, MySpace, and Friendster not only facilitate personal interactions but also serve as valuable platforms for accessing digital entities (Kedawa, 2022, pp. 243-246). They provide opportunities for:

- Attracting users to digital entities.
- Disseminating various announcements and updates.
- Facilitating interaction between digital entity administrators and users, fostering group discussions, collaborative work, and exchange of ideas in multiple formats.
- Employing file-sharing capabilities offered by social networking sites to enhance content access and modification, thus aggregating knowledge and information from diverse sources (Bamfelah, 2015, p. 103).

## **8. Challenges of Utilizing Digital Entities in the Algerian Academic Setting**

The academic community in Algeria encounters a spectrum of challenges that impede the effective utilization of digital entities. These challenges fall into several categories:

### *8.1. Legal Challenges:*

The legal framework presents substantial challenges for digital entities. Noteworthy among the legislations enacted to protect digital entities within the academic sphere is **Ministerial Decree No. 153 dated May 14, 2012**. This decree

mandates the creation of a centralized catalog for dissertations and theses, accessible via the National Portal for Thesis Notification at [PNST](#). Under the auspices of the Ministry of Higher Education and Scientific Research, represented by the National Center for Research in Scientific and Technical Information, academic institutions are obliged, as per Article 03, to notify approved topics through this portal. Additionally, Article 04 of the decree requires institutions to deposit a digital copy post viva voce, enabling content review through a personal identification code within the national online documentation system. Further ministerial resolutions have been enacted to establish and provide access to the National Portal for Scientific Journals and educational platforms hosted on university websites.

### *8.2. Technological and Technical Challenges:*

The complexity inherent in some digital entities requires profound technological literacy and application comprehension. The academic community faces challenges in keeping abreast of regular updates to software and hardware, which can impact the functionality and security of digital entities. These challenges pose threats to the preservation, storage, and accessibility of information. Just as traditional media require meticulous care, so too do digital tools need maintenance to ensure the continued accessibility of stored information in the future (Ben Tazir, 2022, pp. 81-84).

### *8.3. Linguistic Challenges :*

Language barriers significantly hinder the academic community's ability to utilize digital entities. The limitation of digital content to a single language, without options for translation or multilingual support, creates obstacles for non-native speakers, restricting their access to information (Bounif, 2021, p. 472).

### **Study Results:**

Research into the role of digital entities in enhancing digital empowerment for information sources in the academic setting has yielded several insights:

- Digital entities constitute advanced, diverse information environments that comprehensively address the varied needs of users.
- Digital empowerment facilitates the academic community's ability to set personal goals and meet institutional objectives through optimal use of technology, while also providing solutions to challenges.
- Standardization of criteria for the design, accessibility, and protection of digital entities is imperative to achieve intended outcomes.
- Prominent forms of digital entities within the academic sphere include institutional digital repositories, educational platforms, and academic digital content portals.

- Principal services provided by digital entities encompass search and navigation, access, selective information dissemination, and personalization, among others.

- The academic community predominantly accesses digital entities through university websites, hyperlinks, and social networks.

- The deployment of digital entities within the academic environment is fraught with legal, technological, and linguistic challenges.

### **Conclusion :**

In summation, digital entities significantly bolster digital empowerment for beneficiaries of information resources by offering varied digital content and services. These entities contribute to fulfilling the objectives of academic institutions, thereby enhancing digital empowerment bilaterally. It is imperative for the academic community and researchers to fully leverage and continually develop these entities to effectively meet user needs and aspirations, thereby fostering an innovative educational and research environment in the era of modern technology.

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