HEDforALL: Holistic Approach to Accessible Higher Education

RES6 Implementation of an online repository of accessible educational materials

ERASMUS+

Project No: 2021-1-EL01-KA220-HED-000032260

Co-funded by the Erasmus+ Programme of the European Union

This project (2021-1-EL01-KA220-HED-000032260) has been co-funded by the Erasmus+ Programme of the European Commission. This publication reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

DOCUMENT DESCRIPTION

Funding:	ERASMUS+ Programme
Project website:	www.hedforall.eu
Project Result:	RES6: Implementation of an online repository of accessible educational materials
Task No:	Tasks R6.1 – R6.6
Deliverable No:	
Partner responsible:	ITD-CNR
Editor:	- Flavio **Manganello** (ITD-CNR)
Authors:	- Flavio **Manganello** (ITD-CNR) - Andrea **Maddalena** (ITD-CNR) - Giovanni Paolo **Caruso** (ITD-CNR) - Andrea **Ceregini** (ITD-CNR)
Contributors:	- Konstantinos **Papadopoulos**, Eleni **Koustriava**, Konstantinos **Charitakis**, Lisander **Isaraj** (UOM) - José María **Fernández** Gil, Cristina **Palomares Crespo**, Rafael **Molina Carmona** (UA)
Date:	24/01/2025
Status:	Final
Language:	English
Dissemination level:	P = Public
DOI:	
How to cite:	

THE HEDFORALL CONSORTIUM

No.	Partner Name	Logo
1	University of Macedonia (UOM) Project Coordinator	HELLENIC REPUBLIC UNIVERSITY OF MACEDONIA
2	University of Cologne (UOC)	University of Cologne
3	University of Alicante (UA)	Universitat d'Alacant Universidad de Alicante
4	National Research Council of Italy - Institute for Educational Technology (CNR-ITD)	itd ISTITUTO TECNOLOGIE DIDATTICHE

ABBREVIATIONS

Term	Explanation
SwD	Students with Disabilities
HEI	Higher Education Institute
RES	Project Result

Contents

Summary

INTRODUCTION

This document details the activities carried out to prepare **RES 6: Implementation of an Online Repository of Accessible Educational Materials**, a core objective of the HEDforALL project. RES 6 aimed to create a comprehensive online repository where accessible educational materials can be stored, organized, and easily accessed by teaching staff, students with disabilities (SwD), and accessibility advisors. This initiative is critical to ensuring the long-term sustainability of the accessible educational content being developed throughout the project and to promoting inclusive learning environments in higher education.

The overall timeframe for **RES 6** was from **June 1, 2024**, to **January 15, 2025**, and encompassed a series of interconnected tasks that involved the specification of system requirements, the design and development of the repository, and the subsequent uploading and maintenance of accessible educational materials.

Task overview

1. **Task R6.1: System Requirements Specification** *(June 1, 2024 – June 30, 2024).* The first task focused on specifying the system requirements for the online repository, with input from both accessibility experts and end-users (teaching staff and SwD). The aim was to ensure that the repository would be compatible with a wide range of assistive technologies and support various types of accessible materials, including PDFs, DAISY, EPUB, and video formats.

2. **Task R6.2: System Design** *(July 1, 2024 – July 31, 2024)*. Task R6.2 involved designing the system architecture to support all forms of accessible educational materials. This included the repository's user interface, navigation, and content management features, ensuring that the platform would be intuitive, user-friendly, and accessible for a diverse user base. The system design also took into account the technical infrastructure needed to ensure scalability and security.

3. **Task R6.3: System Development** *(August 1, 2024 – October 31, 2024)*. This task involved the development of the online repository based on the requirements and designs from the previous phases. Key features such as content upload functionality, search capabilities, and accessibility integrations were implemented. The system was

designed to support multiple file formats and ensure full compatibility with assistive technologies.

4. **Task R6.4: System Testing** *(November 1, 2024 – November 30, 2024)*. This task started after the system development was finalized. It focused on testing the repository's performance, accessibility, and user interface.

5. **Task R6.5: Uploading of Accessible Educational Materials** *(December 1, 2024 – December 31, 2024)*. Following the system's successful testing, this task involved uploading the first batch of accessible educational materials developed during the HEDforALL project. These materials included textbooks, handouts, presentations, and multimedia content in formats compatible with the repository's standards.

6. **Task R6.6: Maintenance and Improvement of the Repository** *(July 1, 2024 – January 15, 2025)*. The final task involved ongoing maintenance and final improvements to the repository. This phase ensured the repository remains functional and continues to meet the evolving needs of teaching staff, SwD, and accessibility advisors.

This document highlights the collaborative efforts between ITD-CNR, UOM, and project partners, ensuring the repository will provide a long-term, sustainable solution for managing accessible educational content in higher education.

TASK R6.1: SYSTEM REQUIREMENTS SPECIFICATION

Introduction

Task R6.1, conducted from **June 1, 2024, to June 30, 2024**, focused on specifying the system requirements for the implementation of the **online repository of accessible educational materials**. The goal was to define a comprehensive set of functional, technical, and accessibility requirements to ensure that the repository would effectively support the storage and dissemination of various types of accessible educational materials, addressing the needs of both teaching staff and students with disabilities (SwD).

Objectives of Task R6.1

The primary objective of Task R6.1 was to gather and define the necessary system specifications that would guide the development of the repository. This involved identifying:

- The types of accessible educational materials to be supported (e.g., PDFs, DAISY, EPUB, and multimedia content).
- The accessibility standards the system would need to comply with, ensuring compatibility with assistive technologies such as screen readers and text-to-speech tools.
- Key functionalities, including search capabilities, metadata tagging for accessibility, and user roles for managing and uploading materials.
- The technical infrastructure required to ensure security, scalability, and ease of use for all users, including SwD, educators, and accessibility advisors.

Approach

The approach to Task R6.1 included:

1. **Academic literature.** Studies on digital repositories, accessible education, and the integration of assistive technologies into digital platforms were reviewed to gather insights on how to structure the repository and ensure it met accessibility standards.
2. **Grey literature.** Reports from relevant projects and initiatives (e.g., European accessibility projects, national digital accessibility strategies) provided additional

insights into the types of accessible materials to support, system architecture, and user interface design. These reports offered practical examples of systems successfully implemented in similar educational contexts.

3. **Accessibility standards review**: The team reviewed relevant accessibility standards such as **WCAG 2.1** and **Section 508** to ensure that the repository would be fully compliant with the latest guidelines, enabling users with various disabilities to interact with the system effectively.

4. **Technical infrastructure planning**: The IT team analyzed the technical infrastructure, outlining the specifications for cloud storage, content management systems, and data security measures to ensure that the repository would be robust and scalable.

Key specifications identified

Several key system specifications were defined during this task, including:

- **File format support**: The repository supports a wide range of file formats, including accessible PDFs, DAISY, EPUB, and video formats with captions and transcripts.
- **Assistive technology compatibility**: The system is compatible with screen readers, magnification tools, and other assistive technologies commonly used by SwD.
- **Search and filter functionality**: A robust search engine with filtering options based on material type, accessibility features, and keywords was identified as crucial for easy navigation and content retrieval.
- **User roles and permissions**: The system supports multiple user roles, including administrators, content uploaders, and general users, with appropriate permission levels for each.
- **Scalability and security**: Cloud-based storage solutions were recommended to ensure scalability, while robust security measures were outlined to protect user data and content.

Outputs of Task R6.1

The outputs of Task R6.1 are integrated into this report and encompass several key sections that guided the upcoming design and development phases. These include a **comprehensive system requirements section** that outlines the functional, accessibility, and technical specifications for the repository. Additionally, a **literature review summary** is provided, offering insights from academic and grey literature that inform best practices and case studies relevant to the repository's development. Lastly, a **technical infrastructure plan** is included, detailing the system's server requirements, cloud storage solutions, and necessary security protocols to ensure the repository's scalability, security, and reliability.

System requirements

The **system requirements** for the online repository of accessible educational materials are designed to ensure the platform meets the needs of its diverse user base, including teaching staff, students with disabilities (SwD), and accessibility advisors. These requirements address the repository's functional, accessibility, and technical specifications, ensuring it is robust, user-friendly, and compliant with international accessibility standards.

Functional requirements

The repository supports various roles, including administrators, content uploaders (e.g., teaching staff and accessibility advisors), and general users (students and educators). Each user role has specific permissions that define what they can access and modify within the system.

Content uploaders are able to upload educational materials in multiple accessible formats, including PDFs, DAISY, EPUB, and multimedia formats like videos with captions. The repository allows content uploaders to tag materials with appropriate metadata, such as subject, material type, and accessibility features (e.g., captions, alt text).

The repository offers an advanced search functionality, enabling users to search by keywords, content type, and accessibility features. Search results can be filtered by type, date, or accessibility options to make it easier for users to find what they need.

Accessibility requirements

The repository fully complies with **WCAG 2.1** guidelines to ensure it is accessible to users with a wide range of disabilities. This includes compatibility with assistive technologies such as screen readers, text-to-speech software, and voice recognition tools. All content, including uploaded materials, meet these accessibility standards.

The user interface supports keyboard navigation, allowing users to navigate the repository without relying on a mouse. Users also have the ability to adjust text size and contrast levels to improve readability. All non-text content, such as images and graphics, include alt text descriptions, ensuring full accessibility for visually impaired users.

Technical requirements

The repository is a **web-based platform**, accessible through modern web browsers on both desktop and mobile devices. It is hosted on a secure **cloud infrastructure**, ensuring that the system is scalable and capable of supporting increased content and user traffic over time.

Security protocols are implemented to protect user data and educational content. This includes encrypted data storage and secure transmission of information. User authentication is role-based, with content uploaders and administrators having elevated access rights.

A robust backup and disaster recovery plan is put in place to ensure the integrity of the repository's data in case of technical failure or security breach. Regular automated backups will be performed to safeguard content and metadata, ensuring quick restoration in the event of any issues.

Literature review summary

The **literature review** conducted for Task R6.1 focused on identifying best practices and relevant case studies from both academic and grey literature to inform the design and development of the online repository of accessible educational materials. This review provided insights into the key challenges and solutions associated with creating accessible digital platforms for educational purposes, particularly for students with disabilities (SwD) in higher education.

Academic literature

The academic literature offered a broad understanding of the principles underpinning digital accessibility and the role of assistive technologies in educational contexts. Key studies emphasized the importance of **universal design for learning (UDL)**, which advocates for creating learning environments that are accessible to all students, regardless of their disabilities. The UDL framework informed the need for a flexible system that can accommodate a range of disabilities, including visual, auditory, cognitive, and physical impairments.

Research on **digital repositories in education** highlighted the importance of multi-format content support, which ensures that students with different needs can access materials in formats that work best for them. This includes providing content in accessible PDF formats, as well as audio, video, and text formats that are compatible with assistive technologies like screen readers and text-to-speech tools.

The literature also identified the growing role of **distance education** and the necessity for learning management systems (LMS) to be fully accessible. Best practices for designing such systems include integrating features like captioning for videos, transcripts for audio content, and alternative text for images, ensuring that SwD have equal access to educational materials.

Here are some relevant academic references on digital accessibility and assistive technologies in education:

1. Alnahdi, G. (2014). Assistive Technology in Special Education and the Universal Design for Learning. *Turkish Online Journal of Educational Technology*, 13, 18-23. Link to paper.
2. Asselin, S. B. (2011). Assistive Technology in Higher Education. *Chapter in* Advances in Higher Education and Professional Development. Link to paper.
3. Chadli, F. E., Gretete, D., & Moumen, A. (2021). Digital accessibility: A systematic literature review. *SHS Web of Conferences*. Link to paper.
4. Fakhru, A.-N., Khalily, H., Khadr, K., Dirgham, R., & Ayyash, R. (2022). Online Learning Challenges for Students with Disabilities: Digital Accessibility and Universal Design for Learning Solutions. *Hebron University Research Journal (HURJ): B- (Humanities)*. Link to paper.

5. Fichten, C., Asuncion, J., & Scapin, R. (2014). Digital Technology, Learning, and Postsecondary Students with Disabilities: Where We've Been and Where We're Going. *The Journal of Postsecondary Education and Disability*, 27, 369-379. Link to paper.

6. Frost Nájera, C. L. (2021). Una estructura digital accesible es un derecho humano de las personas con discapacidad visual. *Revista Politécnica*. Link to paper.

7. Gay, G. (2023). Open curriculum for teaching digital accessibility. *Frontiers in Computer Science*. Link to paper.

8. Laâbidi, M., Jemni, M., Ben Ayed, L. J., Brahim, H. B., & Ben Jemaa, A. (2014). Learning technologies for people with disabilities. *J. King Saud Univ. Comput. Inf. Sci.*, 26, 29-45. Link to paper.

9. Stefan, I., Stefan, A., Judd, N., Gheorghe, A., & Howard, L. (2020). Digital accessibility in learning-intensive environments. *eLearning and Software for Education*. Link to paper.

Here are five academic references relevant to your text, focused on digital accessibility, cloud-based solutions, metadata tagging, and collaboration in educational content development:

1. Alvey, E. (2022). Cloud services for digital repositories (Library Technology Reports). *Journal of the Australian Library and Information Association*, 71(171), 171-171. Link to paper.

2. Gay, G. (2023). Open curriculum for teaching digital accessibility. *Frontiers in Computer Science*. Link to paper.

3. Lourenço, F. T. R., Paiva, R. S. S., Oliveira, R. A. S., & Almeida, A. M. (2022). The accessibility of Digital Learning Resources: An analysis of audiovisual resources. *Proceedings of the 10th International Conference on Software Development and Technologies for Enhancing Accessibility and Fighting Info-exclusion*. Link to paper.

4. Otón Tortosa, S., Ingavélez-Guerra, P., Sanchez-Gordon, S., & Sánchez-Gordón, M. L. (2020). Evolution of Accessibility Metadata in Educational Resources. *Chapter in Advances in Educational Technology*. Link to paper.

5. Varas, G., Stranger, A. P., & Mobuchon, G. (2023). Managing European interuniversity collaboration: A bottom-up approach to identify digital education challenges from below. *9th International Conference on Higher Education Advances (HEAd'23)*. Link to paper.

Grey literature

The review of grey literature, including reports from previous projects and initiatives, provided practical examples and case studies relevant to the development of the repository. Reports from **European projects** focused on digital accessibility in education, such as those funded by Erasmus+ and Horizon 2020, offered valuable insights into real-world challenges and solutions for ensuring accessibility in educational content repositories.

Case studies from these projects demonstrated the importance of **cloud-based solutions** to ensure scalability and flexibility in managing large volumes of content, particularly for educational institutions that serve diverse populations of students. Additionally, these reports underscored the need for **robust metadata tagging** to enhance the searchability and discoverability of accessible educational materials. Effective metadata allows users to filter content by accessibility features, making it easier for SwD to find materials suited to their needs.

The grey literature also highlighted the importance of **collaboration between teaching staff and accessibility advisors** in the development of educational content. Successful case studies showed that involving these stakeholders in the content creation process helped ensure that materials were not only accessible but also pedagogically sound, addressing both academic and accessibility needs.

Here are five non-academic references that align with the context of digital accessibility in education and repositories:

1. UNESCO. (2021). **Digital Learning in Emergencies: Ensuring Accessibility for All**. A policy brief focusing on accessible learning solutions for disadvantaged groups. Available from: https://unesdoc.unesco.org.

2. European Union. (2021). **Horizon 2020: Digital Education Action Plan (2021-2027)**. Key initiatives on digital accessibility and inclusion in education. Available from: https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/home.

3. European Agency for Special Needs and Inclusive Education. (2018). **Accessible Information for Lifelong Learning**. A report on the use of accessible educational resources across Europe. Available from: https://www.european-agency.org/resources/publications.

4. W3C Web Accessibility Initiative (WAI). (2019). **Web Accessibility in Educational Systems: Case Studies and Examples**. A series of case studies on the implementation of web accessibility standards in educational platforms. Available from: https://www.w3.org/WAI/case-studies.

Key findings and recommendations

From the review of both academic and grey literature, several key findings emerged that directly informed the design of the repository:

- **Multi-format support is essential**: The repository must support a variety of content formats, including accessible PDFs, DAISY, EPUB, and multimedia with captions and transcripts.
- **Assistive technology integration is crucial**: The system must be compatible with tools like screen readers, voice recognition software, and text-to-speech applications to ensure full accessibility.
- **Metadata tagging enhances accessibility**: Effective tagging of content based on subject, type, and accessibility features (e.g., captions, large print) is critical for improving content discoverability for SwD.
- **Collaboration between stakeholders improves quality**: Involving educators, accessibility advisors, and SwD in the design and development of content ensures that both educational and accessibility needs are met.

Technical infrastructure plan

The **Technical Infrastructure Plan** for the online repository of accessible educational materials outlines the necessary hardware, software, and network configurations required to ensure a secure, scalable, and accessible system. This infrastructure must support the storage, management, and dissemination of diverse educational materials while meeting the functional, accessibility, and security requirements defined in the system specifications.

Cloud hosting and scalability

The repository is hosted on a **cloud-based platform**, ensuring flexibility, scalability, and reliability. A cloud solution offers several advantages, including:

- **Scalability**: The system can easily expand to handle increasing amounts of data and users. This is essential as the repository will grow over time, accommodating new materials and users from different institutions.
- **Cost-effectiveness**: A cloud-based infrastructure minimizes the need for extensive physical servers, reducing the upfront and maintenance costs. It allows for a pay-as-you-go model, where costs can be managed based on system usage.
- **Reliability and Uptime**: The cloud hosting service aims to provide a high level of uptime, based on the services offered by UOM. The virtual instance is managed at UOM's data server infrastructure, and uptime guarantees will therefore be subject to UOM's infrastructure. Geo-redundancy will also be ensured, with data backed up across multiple data centers for disaster recovery purposes.

The platform is hosted on an infrastructure that, while not belonging to one of the mentioned Cloud Service Providers (AWS, Google Cloud, or Microsoft Azure), is compatible with them. If necessary, the solution can be deployed on these CSPs to scale performance and meet evolving needs.

Content Management System (CMS)

A **Content Management System (CMS)** lies at the core of the repository, managing the upload, organization, and distribution of educational materials. The CMS must support multi-format content, including PDFs, DAISY, EPUB, video with captions, and other media. It includes:

- **User-friendly interfaces**: For both content uploaders (teaching staff, accessibility advisors) and general users (SwD), the CMS provides an intuitive interface that facilitates uploading, tagging, and retrieving content.
- **Metadata tagging system**: A robust metadata system is embedded into the CMS, allowing content uploaders to tag materials with relevant information (e.g., subject,

content type, accessibility features). This will ensure the effective discoverability of materials by users.

- **Version control**: The CMS provides versioning capabilities, allowing content to be updated or revised without losing access to previous versions. This ensures that all materials remain up to date while preserving older content.

File storage and data management

The repository requires secure, scalable **file storage** to accommodate a wide range of accessible educational materials. Key features include:

- **Large capacity**: The storage system accommodates large media files, including video and audio content, as well as high-quality PDFs and image files. The cloud provider offers flexible storage capacity to ensure that the system can grow as new content is added.
- **Efficient file retrieval**: A distributed storage model ensures that users can quickly access materials, regardless of their geographic location, by optimizing data transfer speeds and reducing latency.

Security and Data Privacy

Security is a top priority for the repository, ensuring the protection of both educational content and user data. The infrastructure includes several layers of security measures:

- **Role-based access control (RBAC)**: The repository implements role-based access control, ensuring that only authorized users (e.g., administrators, content uploaders) have access to certain functionalities, such as uploading or modifying content. General users will have restricted access, limited to viewing and downloading materials.
- **User authentication**: Secure login mechanisms, are implemented to prevent unauthorized access. User credentials are encrypted, and session management will ensure that access is limited to valid sessions.
- **GDPR compliance**: The repository complies with **General Data Protection Regulation (GDPR)** standards, ensuring that all personal data is handled in accordance with European data privacy laws. This includes transparent data collection

policies, user consent for data usage, and mechanisms for users to request deletion of their data.

Backup and Disaster Recovery

To protect against data loss or system failure, the infrastructure includes a robust **backup and disaster recovery plan**:

- **Automated backups**: The repository performs automated daily backups of all content and metadata. These backups are stored in multiple locations to ensure redundancy and quick recovery in case of system failure.

Assistive Technology Compatibility

The repository is designed to be compatible with various **assistive technologies** used by SwD, ensuring full accessibility. These technologies include:

- **Screen readers** (e.g., JAWS, NVDA): The repository's content and interface will be fully navigable using screen readers, ensuring that visually impaired users can access materials.
- **Text-to-speech tools**: Users will be able to interact with text-based content using text-to-speech technologies, which will be supported by the repository's user interface and file formats.
- **Voice recognition software**: Users with mobility impairments will be able to interact with the repository using voice commands, with full compatibility ensured for voice recognition tools such as **Dragon NaturallySpeaking**.

Accessibility and User Interface Design

The repository's user interface (UI) is designed according to **WCAG 2.1** standards, ensuring accessibility for all users. Key features include:

- **Keyboard navigation**: The system is fully navigable using a keyboard, ensuring that users with motor impairments can interact with the repository without needing a mouse.

- **Adjustable visual settings**: The UI allows users to adjust text size, contrast, and color schemes to improve readability for those with visual impairments. These settings will be user-specific and saved for future sessions.
- **Alternative text**: All images and non-text content will include alt text, making the repository fully accessible to screen reader users.

Conclusive remarks on Task R6.1

Task R6.1 successfully laid the foundation for the development of the **online repository of accessible educational materials**. Through careful consultation with stakeholders and a thorough review of accessibility standards, the team was able to identify and document the necessary system specifications guiding the development and testing phases. These outputs ensured that the repository meets the needs of its users, providing an accessible, secure, and user-friendly platform for educational content. The results of this task directly informed **Task R6.2**, where the system design was developed to meet these requirements.

TASK R6.2: SYSTEM DESIGN FOR SUPPORTING ALL TYPES OF ACCESSIBLE EDUCATIONAL MATERIAL

Introduction

Task R6.2, conducted from **July 1, 2024, to July 31, 2024**, focused on designing the system architecture for the **online repository of accessible educational materials**. This phase built upon the specifications defined in Task R6.1 and involved creating a detailed design that would support a variety of accessible educational materials and ensure compatibility with assistive technologies. The design was crucial for providing a user-friendly, scalable, and accessible platform for educators and students with disabilities (SwD).

Objectives of Task R6.2

The main objective of Task R6.2 was to create a comprehensive design that would allow the repository to support different types of educational materials while maintaining high standards of accessibility. The design aimed to ensure:

- Full support for a range of content types, such as PDFs, DAISY, EPUB, videos with captions, and other multimedia.
- Seamless integration with assistive technologies (e.g., screen readers, text-to-speech software).
- An intuitive and accessible user interface for teaching staff, SwD, and accessibility advisors.
- A robust infrastructure capable of handling large volumes of content while ensuring data security and ease of access.

Approach

The design process followed a structured approach, ensuring that all system requirements from Task R6.1 were incorporated into a feasible, practical solution:

1. **User-Centered Design (UCD)**: The design team applied UCD principles to ensure the repository would be accessible, intuitive, and easy to navigate for all users,

including those with disabilities. Mockups of the user interface (UI) were created and refined based on feedback from teaching staff and SwD.

2. **Technical Blueprint**: A technical blueprint of the system's architecture was developed, detailing the software and hardware components needed for the repository, including the content management system (CMS), database, and cloud storage solutions.

3. **Accessibility Integration**: Close collaboration with accessibility experts ensured that the design fully complied with **WCAG 2.1** and other relevant accessibility standards, making it compatible with various assistive technologies. Accessibility features, such as keyboard navigation, screen reader compatibility, and high-contrast UI options, were included in the design.

4. **Scalability and Security**: The design included provisions for scalability, ensuring that the system could accommodate future growth in content volume and user numbers. Security protocols were also integrated to protect sensitive user data and educational content.

Key Design Features

Key features of the system design developed during Task R6.2 include:

- **Multi-format Content Support**: The repository design supports a wide range of formats, including text (PDF, DAISY, EPUB), audio, video (with captions), and images. This ensures flexibility for teaching staff in uploading materials and for SwD in accessing them in their preferred format.

- **Search and Filter Options**: The design includes advanced search and filtering capabilities, allowing users to find materials based on content type, accessibility features (e.g., captioned videos, large print), and subject matter.

- **User Roles and Permissions**: The repository is designed with multiple user roles, such as administrators, educators, and general users (SwD), each with specific permissions for uploading, managing, or accessing materials.

- **Assistive Technology Compatibility**: The system design ensures compatibility with screen readers, voice recognition software, and text-to-speech tools, providing a seamless experience for SwD.
- **Intuitive User Interface**: The UI is designed to be simple and accessible, with features like clear navigation, adjustable text size, and high-contrast color schemes to enhance usability for all users.
- **Content Upload and Management**: Educators and administrators will have access to easy-to-use content upload tools, with options for adding metadata, tags, and descriptions to facilitate content discovery.

Outputs of Task R6.2

The outputs of Task R6.2 included:

1. **System Design Document**: A detailed design document outlining the architecture of the repository, including all technical components, UI/UX design, and accessibility integrations.
2. **UI Prototypes**: Interactive prototypes of the user interface were created to illustrate how the repository would function from a user's perspective. These prototypes will be used in subsequent tasks to ensure the system's usability.
3. **Technical Specifications**: The design phase also produced a set of technical specifications detailing the software, hardware, and infrastructure required to implement the repository, including security and scalability features.
4. **Accessibility Compliance Plan**: A plan ensuring that the repository design adheres to international accessibility standards and integrates seamlessly with assistive technologies.

Conclusive remarks on Task R6.2

Task R6.2 successfully delivered a comprehensive system design that fully supports the creation of an accessible and user-friendly repository for educational materials. The design aligns with the needs identified in Task R6.1, ensuring support for multiple content formats, assistive technology compatibility, and scalability for future growth. The outputs of this task

provided a solid foundation for the next phase, **Task R6.3**, where the system was developed and implemented based on this design blueprint.

TASK R6.3: SYSTEM DEVELOPMENT

Task R6.3 focused on the development of the repository system, ensuring full compliance with the functional, accessibility, and technical requirements established in previous tasks. The development team actively worked on building the system architecture, which included support for multi-format content, robust metadata tagging functionality, and user role management, all in line with the system requirements document.

Special attention was paid to accessibility, ensuring compatibility with assistive technologies such as screen readers and text-to-speech software, thus making the platform inclusive for all users. Throughout this phase, iterative testing was being conducted to ensure that all components are fully integrated and functioning harmoniously.

The platform's user interface was designed with a strong focus on usability, aiming to provide a seamless and intuitive experience. It supports a variety of content formats, enabling easy access and navigation for educators and SwD alike.

Repository

The repository can be accessed at **https://repository.hedforall.eu**.

The platform features a front-office page, to openly navigate thought the materials and to access to a reserved area, based on a back-office dashboard, for registered users.

Front-office page

The front-office interface, as demonstrated in the attached screenshot (see **Figure 1**), displays accessible materials in various formats, with metadata such as author, language, content type, and accessibility options (e.g., visual disabilities). This interface further supports content management, ensuring that educators and SwD can seamlessly access relevant materials.

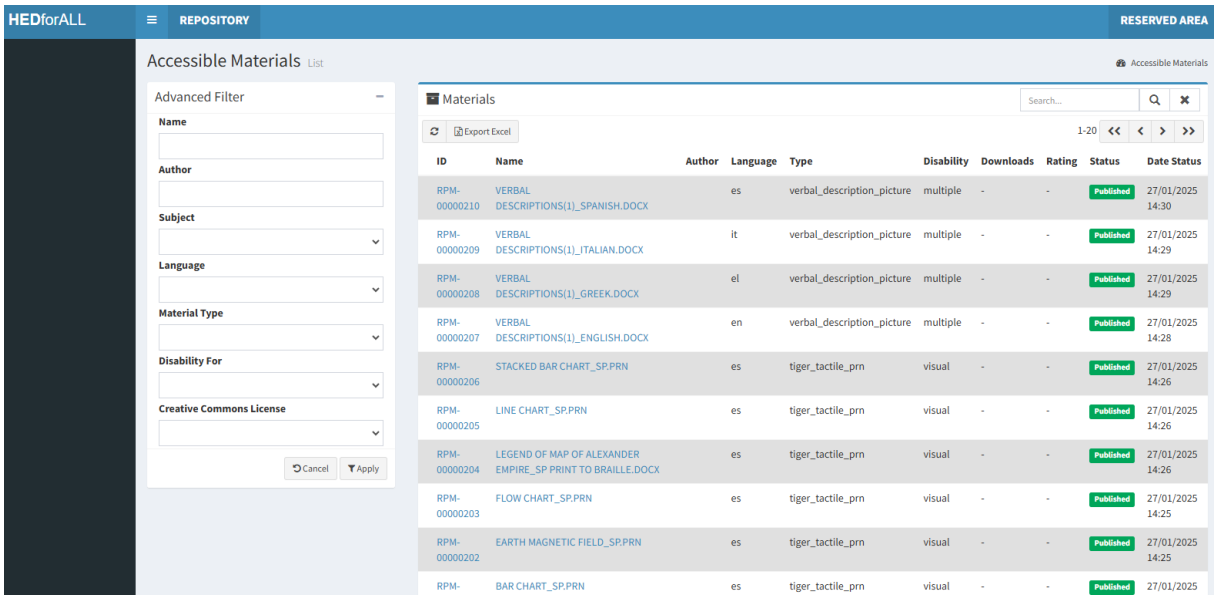

Figure 1. Front Page of HEDforALL Repository.

Figure 2 represents the **detailed view of a resource** in the HEDforALL Repository when accessed without logging in (i.e., **End User**). The interface displays all metadata fields related to the resource, allowing users to review its classification and accessibility information. However, since the user is not logged in, the resource cannot be downloaded.

At the top, the resource title is displayed alongside its unique identifier (**RPM-00000209**). Key metadata fields include **author, subject, language, material type, disability target group, and Creative Commons license**. The material type in this case is a **verbal description picture**, classified under the **multidisciplinary** subject and designed for users with **multiple disabilities**. The language of the document is **Italian**.

The description field remains empty in this instance, and the **author section** does not contain any information. The interface provides a structured overview of the resource but restricts access to the file itself, ensuring that only **registered users** with proper credentials can download the content.

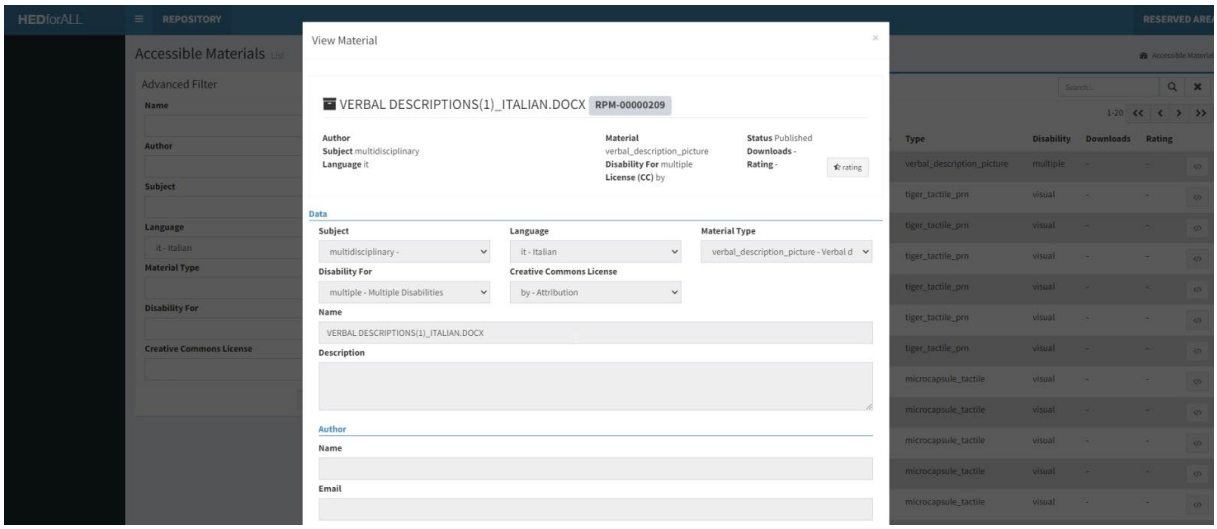

Figure 2. Detailed view of a resource in the HEDforALL Repository when accessed without logging in. Metadata is visible, but downloading is restricted to registered users.

Log-in

The login screen (see **Figure 3**) allows users to securely access the repository with role-based credentials, ensuring a tailored experience for different user groups.

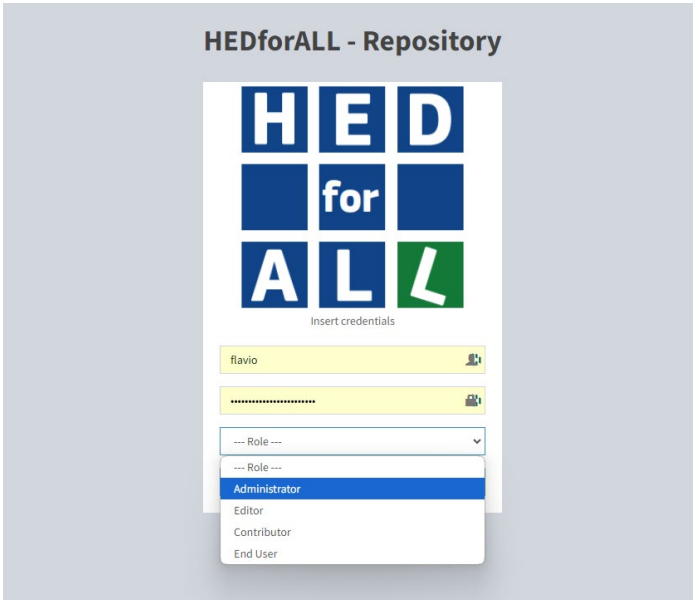

Figure 3. Login Page of HEDforALL Repository.

The login page of the HEDforALL repository features a simple and user-friendly interface. Users are prompted to enter their credentials, including a username and password. In addition, they must select their specific role from a drop-down menu. The available roles include:

1. **Administrator**. Grants full access to all system functionalities, including user management, content moderation, and system settings.
2. **Editor**. Allows users to modify, update, and manage content within the repository but with restricted administrative permissions.
3. **Contributor**. Provides the ability to add and contribute new content but limits the ability to edit or manage existing content. *To register as a Contributor, users must contact the repository's help desk via email. The email address for registration (hedforall@uom.edu.gr) requests is provided on the login page.*
4. **End User**. Offers access to view and download materials within the repository without any content management capabilities.

This role-based system ensures that users have appropriate access according to their responsibilities within the platform, enhancing security and ensuring a streamlined user experience.

Back-office: Home Dashboard

The Dashboard (home page) of the HEDforALL Repository back-office, designed for administrative purposes, is depicted **in Figure 4**. The logged-in user has administrative privileges, as indicated by the "Admin" label and the username ("Flavio Manganello") displayed in the top-right corner.

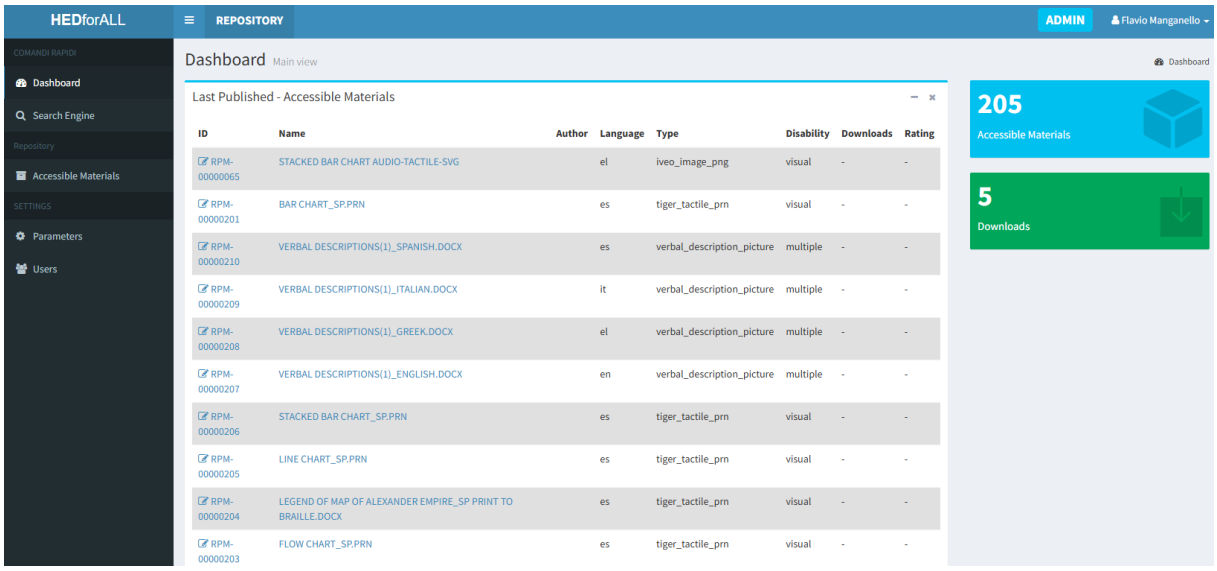

Figure 4. Back-office Page of HEDforALL Repository.

The **admin dashboard** of the HEDforALL repository, as depicted in the image, provides a streamlined interface for managing and organizing accessible materials. Here are its key features:

1. **Main Menu (Left Sidebar)**.
    - **Dashboard**. This is the default landing view where administrators can see an overview of the accessible materials.
    - **Search Engine**. This section allows users to search through the repository's contents using different filters or keywords.
    - **Accessible Materials**. This section lists all the accessible resources available in the repository. Administrators can view, edit, or manage these resources.
    - **Settings**.
        - **Parameters**: This likely includes customizable options for configuring the system's settings and behaviors.
        - **Users**: Admins can manage user roles and permissions from this section.
2. **Accessible Materials Section (Main Content)**.

- **List of Accessible Materials**. Displays the content currently available in the repository. In the provided screenshot, two materials are listed, both authored by J. O. Urmson, titled *Etica di Aristotele*, in different formats (EPUB and PDF) and identified for visual disabilities.
  - **ID**. Each item has a unique repository ID.
  - **Name**. The title of the accessible material.
  - **Author**. The individual or entity responsible for the content.
  - **Language**. The language of the material (in this case, Italian "it").
  - **Type**. The format of the material (e.g., EPUB, PDF).
  - **Disability.** The type of disability the material is tailored for (in this example, "visual").
  - **Downloads**. The number of times the material has been downloaded.
  - **Rating**. A placeholder for user feedback or content ratings.

3. **Quick Stats (Right Sidebar)**.
   - Shows an overview or count of accessible materials available in the repository. In the image, it indicates that there are currently **205 Accessible Materials** available for users to access.

This interface is designed to provide a quick overview of key repository content, while allowing administrators to manage users, settings, and resources in an efficient manner. The dashboard also emphasizes simplicity and ease of navigation, which helps administrators perform tasks related to content organization and user management.

Back-office: Manage Types of Accessible Materials

The page depicted in **Figure 5** is the **Parameters** section, specifically focusing on managing the "Type of Accessible Material". It allows **administrators** to view, edit, and add new categories of accessible materials, ensuring flexibility and adaptability in defining resource types.

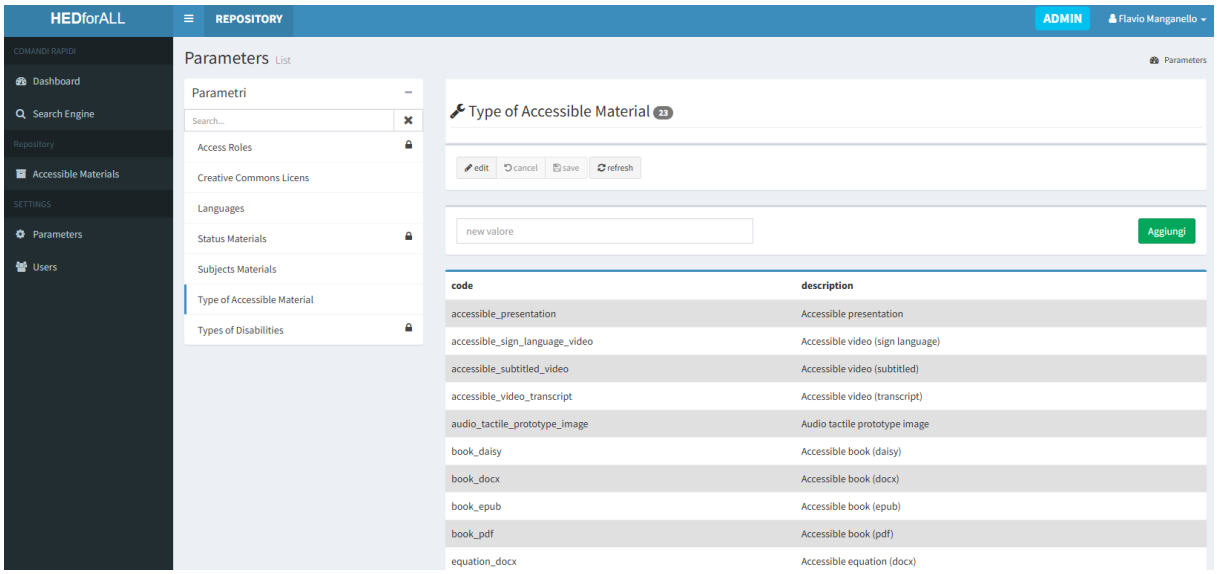

Figure 5. Type of Accessible Material Page of HEDforALL Repository.

Key Features:

- The **list of material types** is displayed in a table format with two columns:
  - **Code**: Represents the internal identifier for each material type.
  - **Description**: Provides a user-friendly label describing the type of material, such as "Accessible presentation", "Accessible video", "Accessible book", "Tactile image", and more specialized formats like "Microcapsule audio tactile" or "Tiger tactile print".
- At the top of the section, there is a form that enables users to **add a new material type**. A text input field is available for entering the code or description of a new type, followed by the "**Add**" (Aggiungi) button to save the new entry.
- For existing material types, the interface provides the option to **edit descriptions or codes**. Buttons labeled "**Edit**" and "**Save**" appear for this purpose, allowing administrators to update entries as needed.
- A **refresh** button ensures the list remains up to date with any changes or additions made during the session.

This section enables the customization of resource types to better reflect the diverse needs of users and materials within the repository. By allowing both editing and the creation of new categories, it ensures scalability and relevance in managing accessible content.

Back-office: Add New Accessible Material

The page depicted in **Figure 6** is the interface for adding a resource to the HEDforALL Repository, specifically designed for managing accessible materials. Mandatory fields are highlighted in red, ensuring that essential information is provided. The layout provides a structured form where administrators can input detailed information about a new resource.

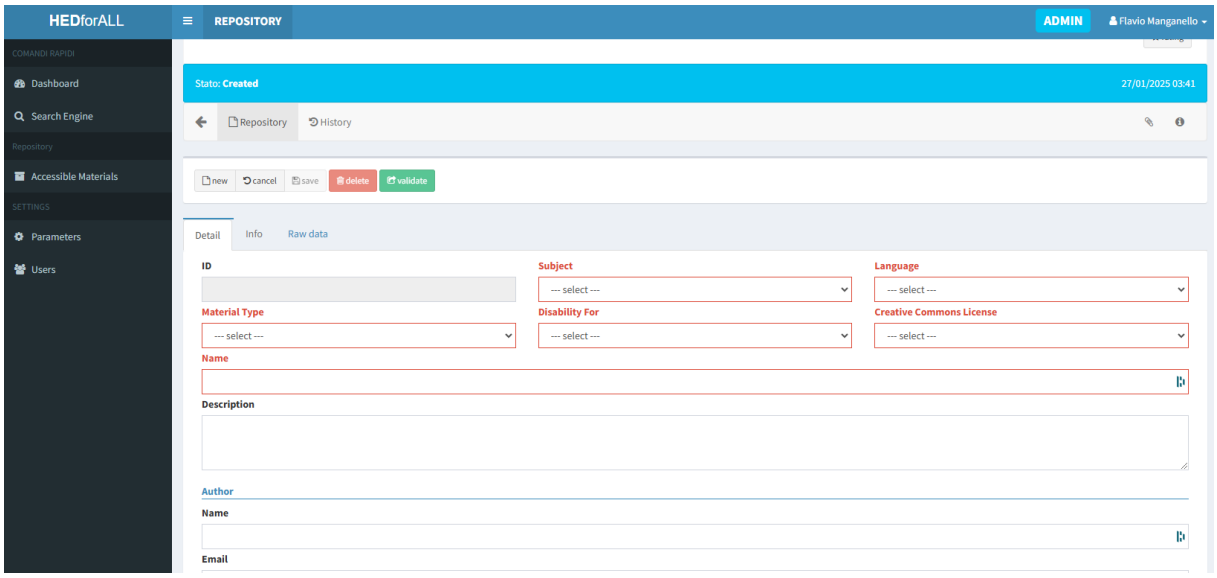

Figure 6. Add New Accessible Material Page of HEDforALL Repository.

At the top, the page displays metadata fields such as Author, Subject, Language, Material Type, and Accessibility information. The current status of the resource is shown as "Created", along with placeholder values for downloads and ratings. A toolbar below includes buttons for saving, deleting, publishing, or updating the resource.

The main section contains form fields for defining essential details of the resource. Administrators can specify the material type, subject, language, intended disability group, and Creative Commons license. Additionally, there are input fields for the resource's name, a description, and author details such as name and email. A section labeled "More Info" allows the addition of notes for further clarification or context.

Below the input fields, there is an area for uploading files associated with the resource. Administrators can drag and drop files or select them manually using the "Upload" button. The attachments table underneath lists the uploaded files, with columns for title, type, size, operator, and upload date, though no files are displayed initially.

The design is minimal and functional, ensuring administrators can provide comprehensive metadata and upload resources efficiently while maintaining accessibility standards. The footer includes copyright information and the system's version number, reinforcing the repository's branding and technical details.

Workflow for adding a resource

The workflow for adding a resource to the HEDforALL Repository begins with completing the mandatory fields, highlighted in red. Once these fields are filled, the administrator saves the form to create a record in the repository's database, generating a unique ID for the resource. At this stage, the administrator can proceed to complete the remaining optional fields and upload the associated file, which represents the resource itself.

To make the resource visible in the front-office for users, an additional step is required: validation. Only after this validation step is completed will the resource become accessible through the repository's public interface. This structured process ensures that all resources meet the necessary standards before being made available to users.

Only **Administrators** and **Editors** can validate resources, making them visible in the front-office, while **Contributors** can only upload resources, which remain pending until validated.

TASK R6.4: SYSTEM TESTING

The next phase, Task R6.4, involved rigorous testing of the developed system to ensure that it meets all the functional and accessibility standards required for the repository. Special attention was paid to testing compatibility with assistive technologies and ensuring compliance with **WCAG 2.1** standards. The testing covered security protocols, load capacity, and user role functionalities to ensure the system is secure, scalable, and easy to use. Any feedback or issues raised during testing was addressed to improve the overall user experience. By the end of this task, the system will be fine-tuned to guarantee a seamless experience for all users.

TASK R6.5: UPLOADING OF ACCESSIBLE EDUCATIONAL MATERIALS

Once the system was fully tested, Task R6.5 focused on uploading the educational materials produced within the HEDforALL project, ensuring they are accessible and properly tagged for easy discovery. These materials include accessible versions of textbooks, handouts, presentations, videos with captions, and other educational resources. Content uploaders will utilize the repository's metadata tagging system to ensure that each material is easily searchable based on subject, type, and accessibility features (e.g., captions, DAISY, EPUB, PDFs). This task also involved ensuring that the materials are appropriately localized and accessible to users with different types of disabilities (visual, auditory, cognitive, and mobility impairments). The materials uploaded to the repository include:

- Accessible Books available in the HEDforALL Repository (n=32) (see Table 1).
- Accessible Math and Chemistry equations available in the HEDforALL Repository (n=24) (see Table 2).
- Accessible pictures and charts available in the HEDforALL Repository (n=133) (see Table 3).
- Accessible presentations available in the HEDforALL Repository (n=4) (see Table 4)
- Accessible videos available in the HEDforALL Repository (n=15) (Table 5).

In total, 208 educational resources have been uploaded to the repository, covering a diverse range of formats and accessibility features. These resources provide comprehensive support for learners with different needs and ensure inclusivity in educational content delivery.

Table 1. Accessible Books available in the HEDforALL Repository (n=32).

CATEGORY (1ST LEVEL)	CATEGORY (2ND LEVEL)	RESOURCE	REPOSITORY CODE	REPOSITORY DESCRIPTION
ACCESSIBLE BOOKS_ENGLISH	COMPLEX BOOKS	DAISY COMPLEX BOOK(1)_ENGLISH	BOOK_DAISY	ACCESSIBLE BOOK (DAISY)
		COMPLEX BOOK(1)_ENGLISH.DOCX	BOOK_DOCX	ACCESSIBLE BOOK (DOCX)
		COMPLEX BOOK(1)_ENGLISH.EPUB	BOOK_EPUB	ACCESSIBLE BOOK (EPUB)
		COMPLEX BOOK(1)_ENGLISH.PDF	BOOK_PDF	ACCESSIBLE BOOK (PDF)
	SIMPLE BOOKS	DAISY SIMPLE BOOK(1)_ENGLISH.ZIP	BOOK_DAISY	ACCESSIBLE BOOK (DAISY)
		SIMPLE BOOK(1)_ENGLISH.DOCX	BOOK_DOCX	ACCESSIBLE BOOK (DOCX)
		SIMPLE BOOK(1)_ENGLISH.EPUB	BOOK_EPUB	ACCESSIBLE BOOK (EPUB)
		SIMPLE BOOK(1)_ENGLISH.PDF	BOOK_PDF	ACCESSIBLE BOOK (PDF)
ACCESSIBLE BOOKS_GREEK	COMPLEX BOOKS	DAISY COMPLEX BOOK(1)_GREEK	BOOK_DAISY	ACCESSIBLE BOOK (DAISY)
		COMPLEX BOOK(1)_GREEK.DOCX	BOOK_DOCX	ACCESSIBLE BOOK (DOCX)
		COMPLEX BOOK(1)_GREEK.EPUB	BOOK_EPUB	ACCESSIBLE BOOK (EPUB)
		COMPLEX BOOK(1)_GREEK.PDF	BOOK_PDF	ACCESSIBLE BOOK (PDF)
	SIMPLE BOOKS	DAISY SIMPLE BOOK(1)_GREEK.ZIP	BOOK_DAISY	ACCESSIBLE BOOK (DAISY)
		SIMPLE BOOK(1)_GREEK.DOCX	BOOK_DOCX	ACCESSIBLE BOOK (DOCX)
		SIMPLE BOOK(1)_GREEK.EPUB	BOOK_EPUB	ACCESSIBLE BOOK (EPUB)
		SIMPLE BOOK(1)_GREEK.PDF	BOOK_PDF	ACCESSIBLE BOOK (PDF)
ACCESSIBLE BOOKS_ITALIAN	COMPLEX BOOKS	DAISY COMPLEX BOOK(1)_ITALIAN	BOOK_DAISY	ACCESSIBLE BOOK (DAISY)
		COMPLEX BOOK(1)_ITALIAN.DOCX	BOOK_DOCX	ACCESSIBLE BOOK (DOCX)
		COMPLEX BOOK(1)_ITALIAN.EPUB	BOOK_EPUB	ACCESSIBLE BOOK (EPUB)
		COMPLEX BOOK(1)_ITALIAN.PDF	BOOK_PDF	ACCESSIBLE BOOK (PDF)
	SIMPLE BOOKS	DAISY SIMPLE BOOK(1)_ITALIAN.ZIP	BOOK_DAISY	ACCESSIBLE BOOK (DAISY)
		SIMPLE BOOK(1)_ITALIAN.DOCX	BOOK_DOCX	ACCESSIBLE BOOK (DOCX)
		SIMPLE BOOK(1)_ITALIAN.EPUB	BOOK_EPUB	ACCESSIBLE BOOK (EPUB)

[RES6] Implementation of an online repository of accessible educational materials

CATEGORY (1ST LEVEL)	CATEGORY (2ND LEVEL)	RESOURCE	REPOSITORY CODE	REPOSITORY DESCRIPTION
		SIMPLE BOOK(1)_ITALIAN.PDF	BOOK_PDF	ACCESSIBLE BOOK (PDF)
ACCESSIBLE BOOKS_SPANISH	COMPLEX BOOKS	DAISY COMPLEX BOOK(1)_SPANISH	BOOK_DAISY	ACCESSIBLE BOOK (DAISY)
		COMPLEX BOOK(1)_SPANISH.DOCX	BOOK_DOCX	ACCESSIBLE BOOK (DOCX)
		COMPLEX BOOK(1)_SPANISH.EPUB	BOOK_EPUB	ACCESSIBLE BOOK (EPUB)
		COMPLEX BOOK(1)_SPANISH.PDF	BOOK_PDF	ACCESSIBLE BOOK (PDF)
	SIMPLE BOOKS	DAISY SIMPLE BOOK(1)_SPANISH.ZIP	BOOK_DAISY	ACCESSIBLE BOOK (DAISY)
		SIMPLE BOOK(1)_SPANISH.DOCX	BOOK_DOCX	ACCESSIBLE BOOK (DOCX)
		SIMPLE BOOK(1)_SPANISH.EPUB	BOOK_EPUB	ACCESSIBLE BOOK (EPUB)
		SIMPLE BOOK(1)_SPANISH.PDF	BOOK_PDF	ACCESSIBLE BOOK (PDF)

Table 2. Accessible Math and Chem equations available in the HEDforALL Repository (n=24).

CATEGORY (1ST LEVEL)	CATEGORY (2ND LEVEL)	RESOURCE	REPOSITORY CODE	REPOSITORY DESCRIPTION
CHEMICAL EQUATIONS	CHEMICAL EQUATIONS_ENGLISH	CHEM EQUATIONS(1)_ENGLISH.DOCX	EQUATION_DOCX	ACCESSIBLE EQUATION (DOCX)
		CHEM EQUATIONS(1)_ENGLISH.HTM	EQUATION_HTM	ACCESSIBLE EQUATION (HTM)
		CHEM VERBAL DESCRIPTIONS(1)_ENGLISH.DOCX	EQUATION_DOCX	ACCESSIBLE EQUATION (DOCX)
	CHEMICAL EQUATIONS_GREEK	CHEM EQUATIONS(1)_GREEK.DOCX	EQUATION_DOCX	ACCESSIBLE EQUATION (DOCX)
		CHEM EQUATIONS(1)_GREEK.HTM	EQUATION_HTM	ACCESSIBLE EQUATION (HTM)
		CHEM VERBAL DESCRIPTIONS(1)_GREEK.DOCX	EQUATION_DOCX	ACCESSIBLE EQUATION (DOCX)
	CHEMICAL EQUATIONS_ITALIAN	CHEM EQUATIONS(1)_ITALIAN.DOCX	EQUATION_DOCX	ACCESSIBLE EQUATION (DOCX)
		CHEM EQUATIONS(1)_ITALIAN.HTM	EQUATION_HTM	ACCESSIBLE EQUATION (HTM)
		CHEM VERBAL DESCRIPTIONS(1)_ITALIAN.DOCX	EQUATION_DOCX	ACCESSIBLE EQUATION (DOCX)
	CHEMICAL EQUATIONS_SPANISH	CHEM EQUATIONS(1)_SPANISH.DOCX	EQUATION_DOCX	ACCESSIBLE EQUATION (DOCX)
		CHEM EQUATIONS(1)_SPANISH.HTM	EQUATION_HTM	ACCESSIBLE EQUATION (HTM)
		CHEM VERBAL DESCRIPTIONS(1)_SPANISH.DOCX	EQUATION_DOCX	ACCESSIBLE EQUATION (DOCX)
MATH EQUATIONS	MATH EQUATIONS_ENGLISH	MATH EQUATIONS(1)_ENGLISH.DOCX	EQUATION_DOCX	ACCESSIBLE EQUATION (DOCX)
		MATH EQUATIONS(1)_ENGLISH.HTM	EQUATION_HTM	ACCESSIBLE EQUATION (HTM)
		MATH VERBAL DESCRIPTIONS(1)_ENGLISH.DOCX	EQUATION_DOCX	ACCESSIBLE EQUATION (DOCX)
	MATH EQUATIONS_GREEK	MATH EQUATIONS(1)_GREEK.DOCX	EQUATION_DOCX	ACCESSIBLE EQUATION (DOCX)
		MATH EQUATIONS(1)_GREEK.HTM	EQUATION_HTM	ACCESSIBLE EQUATION (HTM)

[RES6] Implementation of an online repository of accessible educational materials

CATEGORY (1ST LEVEL)	CATEGORY (2ND LEVEL)	RESOURCE	REPOSITORY CODE	REPOSITORY DESCRIPTION
		MATH VERBAL DESCRIPTIONS(1)_GREEK.DOCX	EQUATION_DOCX	ACCESSIBLE EQUATION (DOCX)
	MATH EQUATIONS_ITALIAN	MATH EQUATIONS(1)_ITALIAN.DOCX	EQUATION_DOCX	ACCESSIBLE EQUATION (DOCX)
		MATH EQUATIONS(1)_ITALIAN.HTM	EQUATION_HTM	ACCESSIBLE EQUATION (HTM)
		MATH VERBAL DESCRIPTIONS(1)_ITALIAN.DOCX	EQUATION_DOCX	ACCESSIBLE EQUATION (DOCX)
	MATH EQUATIONS_SPANISH	MATH EQUATIONS(1)_SPANISH.DOCX	EQUATION_DOCX	ACCESSIBLE EQUATION (DOCX)
		MATH EQUATIONS(1)_SPANISH.HTM	EQUATION_HTM	ACCESSIBLE EQUATION (HTM)
		MATH VERBAL DESCRIPTIONS(1)_SPANISH.DOCX	EQUATION_DOCX	ACCESSIBLE EQUATION (DOCX)

Table 3. Accessible pictures and charts available in the HEDforALL Repository (n=133).

CATEGORY (1ST LEVEL)	CATEGORY (2ND LEVEL)	CATEGORY (3RD LEVEL)	RESOURCE	REPOSITORY CODE	REPOSITORY DESCRIPTION
AUDIO TACTILE	AUDIO TACTILE PROTOTYPE IMAGES		COPY OF BAR CHART.JPG	AUDIO_TACTILE_PROTOTYPE_IMAGE	AUDIO TACTILE PROTOTYPE IMAGE
			COPY OF EARTH MAGNETIC FIELD.PNG	AUDIO_TACTILE_PROTOTYPE_IMAGE	AUDIO TACTILE PROTOTYPE IMAGE
			COPY OF FLOW CHART.PNG	AUDIO_TACTILE_PROTOTYPE_IMAGE	AUDIO TACTILE PROTOTYPE IMAGE
			COPY OF LINE CHART.PNG	AUDIO_TACTILE_PROTOTYPE_IMAGE	AUDIO TACTILE PROTOTYPE IMAGE
			COPY OF MAP ALEXANDER EMPIRE.JPG	AUDIO_TACTILE_PROTOTYPE_IMAGE	AUDIO TACTILE PROTOTYPE IMAGE
			COPY OF SOLAR SYSTEM.JPG	AUDIO_TACTILE_PROTOTYPE_IMAGE	AUDIO TACTILE PROTOTYPE IMAGE
			COPY OF STACKED BAR CHART.PNG	AUDIO_TACTILE_PROTOTYPE_IMAGE	AUDIO TACTILE PROTOTYPE IMAGE
	IVEO FILES_GR	IVEO FILES_GR DIGITAL PNG	BAR CHART AUDIO-TACTILE-SVG.PNG	IVEO_IMAGE_PNG	IVEO IMAGE (PNG)
			EARTH MAGNETIC FIELD AUDIO-TACTILE-SVG.PNG	IVEO_IMAGE_PNG	IVEO IMAGE (PNG)
			FLOW CHART AUDIO-TACTILE-SVG.PNG	IVEO_IMAGE_PNG	IVEO IMAGE (PNG)
			LINE CHART AUDIO-TACTILE-SVG.PNG	IVEO_IMAGE_PNG	IVEO IMAGE (PNG)
			MAP ALEXANDER EMPIRE AUDIO-TACTILE-SVG.PNG	IVEO_IMAGE_PNG	IVEO IMAGE (PNG)
			MAP ALEXANDER EMPIRE AUDIO-TACTILE-SVG-01.PNG	IVEO_IMAGE_PNG	IVEO IMAGE (PNG)
			SOLAR SYSTEM AUDIO-TACTILE-SVG.PNG	IVEO_IMAGE_PNG	IVEO IMAGE (PNG)
			STACKED BAR CHART AUDIO-TACTILE-SVG.PNG	IVEO_IMAGE_PNG	IVEO IMAGE (PNG)
		IVEO FILES_GR SVG_GR	BAR CHART AUDIO-TACTILE-SVG_GR.SVG	IVEO_IMAGE_SVG	IVEO IMAGE (SVG)
			EARTH MAGNETIC FIELD AUDIO-	IVEO_IMAGE_SVG	IVEO IMAGE (SVG)

CATEGORY (1ST LEVEL)	CATEGORY (2ND LEVEL)	CATEGORY (3RD LEVEL)	RESOURCE	REPOSITORY CODE	REPOSITORY DESCRIPTION
			TACTILE-SVG_GR.SVG		
			FLOW CHART AUDIO-TACTILE-SVG_GR.SVG	IVEO_IMAGE_SVG	IVEO IMAGE (SVG)
			LINE CHART AUDIO-TACTILE-SVG_GR.SVG	IVEO_IMAGE_SVG	IVEO IMAGE (SVG)
			MAP ALEXANDER EMPIRE AUDIO-TACTILE-SVG_GR.SVG	IVEO_IMAGE_SVG	IVEO IMAGE (SVG)
			SOLAR SYSTEM AUDIO-TACTILE-SVG_GR.SVG	IVEO_IMAGE_SVG	IVEO IMAGE (SVG)
			STACKED BAR CHART AUDIO-TACTILE-SVG_GR.SVG	IVEO_IMAGE_SVG	IVEO IMAGE (SVG)
	MICROCAPSULE AUDIO TACTILE	MICROCAPSULE AUDIO TACTILE (PDF)	BAR CHART AUDIO-TACTILE.PDF	MICROCAPSULE_AUDIO_TACTILE_PDF	MICROCAPSULE AUDIO TACTILE PRINT (PDF)
			EARTH MAGNETIC FIELD AUDIO-TACTILE.PDF	MICROCAPSULE_AUDIO_TACTILE_PDF	MICROCAPSULE AUDIO TACTILE PRINT (PDF)
			FLOW CHART AUDIO-TACTILE-SVG.PDF	MICROCAPSULE_AUDIO_TACTILE_PDF	MICROCAPSULE AUDIO TACTILE PRINT (PDF)
			LINE CHART AUDIO-TACTILE-SVG.PDF	MICROCAPSULE_AUDIO_TACTILE_PDF	MICROCAPSULE AUDIO TACTILE PRINT (PDF)
			MAP ALEXANDER EMPIRE AUDIO-TACTILE-SVG.PDF	MICROCAPSULE_AUDIO_TACTILE_PDF	MICROCAPSULE AUDIO TACTILE PRINT (PDF)
			SOLAR SYSTEM AUDIO-TACTILE-SVG.PDF	MICROCAPSULE_AUDIO_TACTILE_PDF	MICROCAPSULE AUDIO TACTILE PRINT (PDF)
			STACKED BAR CHART AUDIO-TACTILE-SVG.PDF	MICROCAPSULE_AUDIO_TACTILE_PDF	MICROCAPSULE AUDIO TACTILE PRINT (PDF)
		MICROCAPSULE AUDIO TACTILE (PNG)	BAR CHART AUDIO-TACTILE-PRINT.PNG	MICROCAPSULE_AUDIO_TACTILE_PNG	MICROCAPSULE AUDIO TACTILE PRINT (PNG)
			EARTH MAGNETIC FIELD AUDIO-TACTILE-PRINT.PNG	MICROCAPSULE_AUDIO_TACTILE_PNG	MICROCAPSULE AUDIO TACTILE PRINT (PNG)
			FLOW CHART AUDIO-TACTILE-PRINT.PNG	MICROCAPSULE_AUDIO_TACTILE_PNG	MICROCAPSULE AUDIO TACTILE PRINT (PNG)

CATEGORY (1ST LEVEL)	CATEGORY (2ND LEVEL)	CATEGORY (3RD LEVEL)	RESOURCE	REPOSITORY CODE	REPOSITORY DESCRIPTION
			LINE CHART AUDIO-TACTILE-PRINT.PNG	MICROCAPSULE_AUDIO_TACTILE_PNG	MICROCAPSULE AUDIO TACTILE PRINT (PNG)
			MAP ALEXANDER EMPIRE AUDIO-TACTILE-PRINT.PNG	MICROCAPSULE_AUDIO_TACTILE_PNG	MICROCAPSULE AUDIO TACTILE PRINT (PNG)
			SOLAR SYSTEM AUDIO-TACTILE-PRINT.PNG	MICROCAPSULE_AUDIO_TACTILE_PNG	MICROCAPSULE AUDIO TACTILE PRINT (PNG)
			STACKED BAR CHART AUDIO-TACTILE-PRINT.PNG	MICROCAPSULE_AUDIO_TACTILE_PNG	MICROCAPSULE AUDIO TACTILE PRINT (PNG)
PROTOTYPE IMAGES			BAR CHART.JPG	PROTOTYPE_IMAGE	PROTOTYPE IMAGE
			EARTH MAGNETIC FIELD.PNG	PROTOTYPE_IMAGE	PROTOTYPE IMAGE
			FLOW CHART.PNG	PROTOTYPE_IMAGE	PROTOTYPE IMAGE
			LINE CHART.PNG	PROTOTYPE_IMAGE	PROTOTYPE IMAGE
			MAP ALEXANDER EMPIRE.JPG	PROTOTYPE_IMAGE	PROTOTYPE IMAGE
			SOLAR SYSTEM.JPG	PROTOTYPE_IMAGE	PROTOTYPE IMAGE
			STACKED BAR CHART.PNG	PROTOTYPE_IMAGE	PROTOTYPE IMAGE
TACTILE PICTURES AND CHARTS	ILLUSTRATOR FILES		BAR CHART.AI	ILLUSTRATOR_IMAGE	ILLUSTRATOR FILE
			EARTH MAGNETIC FIELD.AI	ILLUSTRATOR_IMAGE	ILLUSTRATOR FILE
			FLOW CHART.AI	ILLUSTRATOR_IMAGE	ILLUSTRATOR FILE
			LINE CHART.AI	ILLUSTRATOR_IMAGE	ILLUSTRATOR FILE
			MAP ALEXANDER EMPIRE PART_A.AI	ILLUSTRATOR_IMAGE	ILLUSTRATOR FILE
			MAP ALEXANDER EMPIRE PART_B.AI	ILLUSTRATOR_IMAGE	ILLUSTRATOR FILE
			MAP ALEXANDER EMPIRE.AI	ILLUSTRATOR_IMAGE	ILLUSTRATOR FILE
			SOLAR SYSTEM.AI	ILLUSTRATOR_IMAGE	ILLUSTRATOR FILE
			STACKED BAR CHART.AI	ILLUSTRATOR_IMAGE	ILLUSTRATOR FILE
	MICROCAPSULE PAPER PRINTS	MICROCAPSULE TACTILE_ENG	BAR CHART_ENG.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
			EARTH MAGNETIC FIELD_ENG.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
			FLOW CHART_ENG.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE

CATEGORY (1ST LEVEL)	CATEGORY (2ND LEVEL)	CATEGORY (3RD LEVEL)	RESOURCE	REPOSITORY CODE	REPOSITORY DESCRIPTION
			LEGEND OF MAP OF ALEXANDER EMPIRE_ENG PRINT TO BRAILLE.DOCX	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
			LINE CHART_ENG.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
			MAP ALEXANDER EMPIRE PART_A.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
			MAP ALEXANDER EMPIRE PART_B.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
			SOLAR SYSTEM_ENG.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
			STACKED BAR CHART_ENG.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
		MICROCAPSULE TACTILE_GR	BAR CHART_GR.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
			EARTH MAGNETIC FIELD_GR.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
			FLOW CHART_GR.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
			LEGEND OF MAP OF ALEXANDER EMPIRE_GR PRINT TO BRAILLE.DOCX	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
			LINE CHART_GR.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
			MAP ALEXANDER EMPIRE PART_A.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
			MAP ALEXANDER EMPIRE PART_B.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
			SOLAR SYSTEM_GR.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
			STACKED BAR CHART_GR.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
		MICROCAPSULE TACTILE_IT	BAR CHART_IT.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
			EARTH MAGNETIC FIELD_IT.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
			FLOW CHART_IT.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
			LEGEND OF MAP OF ALEXANDER EMPIRE_IT PRINT TO BRAILLE.DOCX	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE

CATEGORY (1ST LEVEL)	CATEGORY (2ND LEVEL)	CATEGORY (3RD LEVEL)	RESOURCE	REPOSITORY CODE	REPOSITORY DESCRIPTION
			LINE CHART_IT.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
			MAP ALEXANDER EMPIRE PART_A.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
			MAP ALEXANDER EMPIRE PART_B.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
			SOLAR SYSTEM_IT.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
			STACKED BAR CHART_IT.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
		MICROCAPSULE TACTILE_SPN	BAR CHART_SP.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
			EARTH MAGNETIC FIELD_SP.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
			FLOW CHART_SP.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
			LEGEND OF MAP OF ALEXANDER EMPIRE_SP PRINT TO BRAILLE.DOCX	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
			LINE CHART_SP.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
			MAP ALEXANDER EMPIRE PART_A.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
			MAP ALEXANDER EMPIRE PART_B.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
			SOLAR SYSTEM_SP.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
			STACKED BAR CHART_SP.PNG	MICROCAPSULE_TACTILE	MICROCAPSULE TACTILE
	TACTILE PICTURES PROTOTYPE IMAGES		COPY OF BAR CHART.JPG	TACTILE_PICTURE_PROTOTYPE_IMAGE	TACTILE PICTURE PROTOTYPE IMAGE
			COPY OF EARTH MAGNETIC FIELD.PNG	TACTILE_PICTURE_PROTOTYPE_IMAGE	TACTILE PICTURE PROTOTYPE IMAGE
			COPY OF FLOW CHART.PNG	TACTILE_PICTURE_PROTOTYPE_IMAGE	TACTILE PICTURE PROTOTYPE IMAGE
			COPY OF LINE CHART.PNG	TACTILE_PICTURE_PROTOTYPE_IMAGE	TACTILE PICTURE PROTOTYPE IMAGE
			COPY OF MAP ALEXANDER EMPIRE.JPG	TACTILE_PICTURE_PROTOTYPE_IMAGE	TACTILE PICTURE PROTOTYPE IMAGE

CATEGORY (1ST LEVEL)	CATEGORY (2ND LEVEL)	CATEGORY (3RD LEVEL)	RESOURCE	REPOSITORY CODE	REPOSITORY DESCRIPTION
			COPY OF SOLAR SYSTEM.JPG	TACTILE_PICTURE_PROTOTYPE_IMAGE	TACTILE PICTURE PROTOTYPE IMAGE
			COPY OF STACKED BAR CHART.PNG	TACTILE_PICTURE_PROTOTYPE_IMAGE	TACTILE PICTURE PROTOTYPE IMAGE
	TIGER TACTILE PRINTS	TIGER TACTILE_ENG (PRN)	BAR CHART_ENG.PRN	TIGER_TACTILE_PRN	TIGER TACTILE PRINT (PRN)
			EARTH MAGNETIC FIELD_ENG.PRN	TIGER_TACTILE_PRN	TIGER TACTILE PRINT (PRN)
			FLOW CHART_ENG.PRN	TIGER_TACTILE_PRN	TIGER TACTILE PRINT (PRN)
			LEGEND OF MAP OF ALEXANDER EMPIRE_ENG PRINT TO BRAILLE.DOCX	TIGER_TACTILE_PRN	TIGER TACTILE PRINT (PRN)
			LINE CHART_ENG.PRN	TIGER_TACTILE_PRN	TIGER TACTILE PRINT (PRN)
			MAP ALEXANDER EMPIRE PART_A.PRN	TIGER_TACTILE_PRN	TIGER TACTILE PRINT (PRN)
			MAP ALEXANDER EMPIRE PART_B.PRN	TIGER_TACTILE_PRN	TIGER TACTILE PRINT (PRN)
			STACKED BAR CHART_ENG.PRN	TIGER_TACTILE_PRN	TIGER TACTILE PRINT (PRN)
		TIGER TACTILE_ENG (PNG)	BAR CHART_ENG TIGER PRINT.PNG	TIGER_TACTILE_PNG	TIGER TACTILE PRINT (PNG)
			EARTH MAGNETIC FIELD_ENG TIGER PRINT.PNG	TIGER_TACTILE_PNG	TIGER TACTILE PRINT (PNG)
			FLOW CHART_ENG TIGER PRINT.PNG	TIGER_TACTILE_PNG	TIGER TACTILE PRINT (PNG)
			LINE CHART_ENG TIGER PRINT.PNG	TIGER_TACTILE_PNG	TIGER TACTILE PRINT (PNG)
			MAP ALEXANDER EMPIRE PART_A TIGER PRINT.PNG	TIGER_TACTILE_PNG	TIGER TACTILE PRINT (PNG)
			MAP ALEXANDER EMPIRE PART_B TIGER PRINT.PNG	TIGER_TACTILE_PNG	TIGER TACTILE PRINT (PNG)
			SOLAR SYSTEM_ENG TIGER PRINT.PNG	TIGER_TACTILE_PNG	TIGER TACTILE PRINT (PNG)
			STACKED BAR CHART_ENG TIGER PRINT.PNG	TIGER_TACTILE_PNG	TIGER TACTILE PRINT (PNG)
		TIGER TACTILE_GR (PRN)	BAR CHART_GR.PRN	TIGER_TACTILE_PRN	TIGER TACTILE PRINT (PRN)

CATEGORY (1ST LEVEL)	CATEGORY (2ND LEVEL)	CATEGORY (3RD LEVEL)	RESOURCE	REPOSITORY CODE	REPOSITORY DESCRIPTION
			EARTH MAGNETIC FIELD_GR.PRN	TIGER_TACTILE_PRN	TIGER TACTILE PRINT (PRN)
			FLOW CHART_GR.PRN	TIGER_TACTILE_PRN	TIGER TACTILE PRINT (PRN)
			LEGEND OF MAP OF ALEXANDER EMPIRE_GR PRINT TO BRAILLE.DOCX	TIGER_TACTILE_PRN	TIGER TACTILE PRINT (PRN)
			LINE CHART_GR.PRN	TIGER_TACTILE_PRN	TIGER TACTILE PRINT (PRN)
			STACKED BAR CHART_GR.PRN	TIGER_TACTILE_PRN	TIGER TACTILE PRINT (PRN)
		TIGER TACTILE_IT (PRN)	BAR CHART_IT.PRN	TIGER_TACTILE_PRN	TIGER TACTILE PRINT (PRN)
			EARTH MAGNETIC FIELD_IT.PRN	TIGER_TACTILE_PRN	TIGER TACTILE PRINT (PRN)
			FLOW CHART_IT.PRN	TIGER_TACTILE_PRN	TIGER TACTILE PRINT (PRN)
			LEGEND OF MAP OF ALEXANDER EMPIRE_IT PRINT TO BRAILLE.DOCX	TIGER_TACTILE_PRN	TIGER TACTILE PRINT (PRN)
			LINE CHART_IT.PRN	TIGER_TACTILE_PRN	TIGER TACTILE PRINT (PRN)
			STACKED BAR CHART_IT.PRN	TIGER_TACTILE_PRN	TIGER TACTILE PRINT (PRN)
		TIGER TACTILE_SP (PRN)	BAR CHART_SP.PRN	TIGER_TACTILE_PRN	TIGER TACTILE PRINT (PRN)
			EARTH MAGNETIC FIELD_SP.PRN	TIGER_TACTILE_PRN	TIGER TACTILE PRINT (PRN)
			FLOW CHART_SP.PRN	TIGER_TACTILE_PRN	TIGER TACTILE PRINT (PRN)
			LEGEND OF MAP OF ALEXANDER EMPIRE_SP PRINT TO BRAILLE.DOCX	TIGER_TACTILE_PRN	TIGER TACTILE PRINT (PRN)
			LINE CHART_SP.PRN	TIGER_TACTILE_PRN	TIGER TACTILE PRINT (PRN)
			STACKED BAR CHART_SP.PRN	TIGER_TACTILE_PRN	TIGER TACTILE PRINT (PRN)
VERBAL DESCRIPTIONS			VERBAL DESCRIPTIONS(1)_ENGLISH.DOCX	VERBAL_DESCRIPTION_PICTURE	VERBAL DESCRIPTION (PICTURES AND CHARTS)
			VERBAL DESCRIPTIONS(1)_GREEK.DOCX	VERBAL_DESCRIPTION_PICTURE	VERBAL DESCRIPTION

[RES6] Implementation of an online repository of accessible educational materials

CATEGORY (1ST LEVEL)	CATEGORY (2ND LEVEL)	CATEGORY (3RD LEVEL)	RESOURCE	REPOSITORY CODE	REPOSITORY DESCRIPTION
					(PICTURES AND CHARTS)
			VERBAL DESCRIPTIONS(1)_ITALIAN.DOCX	VERBAL_DESCRIPTION_PICTURE	VERBAL DESCRIPTION (PICTURES AND CHARTS)
			VERBAL DESCRIPTIONS(1)_SPANISH.DOCX	VERBAL_DESCRIPTION_PICTURE	VERBAL DESCRIPTION (PICTURES AND CHARTS)

Table 4. Accessible presentations available in the HEDforALL Repository (n=4).

CATEGORY (1ST LEVEL)	RESOURCE	REPOSITORY CODE	REPOSITORY DESCRIPTION
ACCESSIBLE PRESENTATIONS	ACCESSIBLE PRESENTATION(1)_ENGLISH.PPTX	ACCESSIBLE_PRESENTATION	ACCESSIBLE PRESENTATION
	ACCESSIBLE PRESENTATION(1)_GREEK.PPTX	ACCESSIBLE_PRESENTATION	ACCESSIBLE PRESENTATION
	ACCESSIBLE PRESENTATION(1)_ITALIAN.PPTX	ACCESSIBLE_PRESENTATION	ACCESSIBLE PRESENTATION
	ACCESSIBLE PRESENTATION(1)_SPANISH.PPTX	ACCESSIBLE_PRESENTATION	ACCESSIBLE PRESENTATION

Table 5. Accessible videos available in the HEDforALL Repository (n=15).

CATEGORY (1ST LEVEL)	CATEGORY (2ND LEVEL)	RESOURCE	REPOSITORY CODE	REPOSITORY DESCRIPTION
ACCESSIBLE VIDEOS	VIDEO HEARING IMPAIRMENT VIDEO AND SUBTITLES	VIDEO HEARING IMPAIRMENT SUBTITLES(1)_ENGLISH.MP4	ACCESSIBLE_SUBTITLED_VIDEO	ACCESSIBLE VIDEO (SUBTITLED)
		VIDEO HEARING IMPAIRMENT SUBTITLES(1)_GREEK.MP4	ACCESSIBLE_SUBTITLED_VIDEO	ACCESSIBLE VIDEO (SUBTITLED)
		VIDEO HEARING IMPAIRMENT SUBTITLES(1)_ITALIAN.MP4	ACCESSIBLE_SUBTITLED_VIDEO	ACCESSIBLE VIDEO (SUBTITLED)
		VIDEO HEARING IMPAIRMENT SUBTITLES(1)_SPANISH.MP4	ACCESSIBLE_SUBTITLED_VIDEO	ACCESSIBLE VIDEO (SUBTITLED)
	VIDEO HEARING IMPAIRMENT VIDEO AND SUBTITLES	VIDEO HEARING IMPAIRMENT SUBTITLES(1)_ENGLISH.SRT	ACCESSIBLE_SUBTITLED_VIDEO	ACCESSIBLE VIDEO (SUBTITLED)
		VIDEO HEARING IMPAIRMENT SUBTITLES(1)_GREEK.SRT	ACCESSIBLE_SUBTITLED_VIDEO	ACCESSIBLE VIDEO (SUBTITLED)
		VIDEO HEARING IMPAIRMENT SUBTITLES(1)_ITALIAN.SRT	ACCESSIBLE_SUBTITLED_VIDEO	ACCESSIBLE VIDEO (SUBTITLED)
		VIDEO HEARING IMPAIRMENT SUBTITLES(1)_SPANISH.SRT	ACCESSIBLE_SUBTITLED_VIDEO	ACCESSIBLE VIDEO (SUBTITLED)
	VIDEO HEARING IMPAIRMENT SIGN LANGUAGE	VIDEO HEARING IMPAIRMENT SIGN LANGUAGE(1)_GREEK.MP4	ACCESSIBLE_VIDEO_SIGN_LANGUAGE	ACCESSIBLE VIDEO (SIGN LANGUAGE)
		VIDEO HEARING IMPAIRMENT SIGN LANGUAGE(1)_ITALIAN.MP4	ACCESSIBLE_VIDEO_SIGN_LANGUAGE	ACCESSIBLE VIDEO (SIGN LANGUAGE)
		VIDEO HEARING IMPAIRMENT SIGN LANGUAGE(1)_SPANISH.MP4	ACCESSIBLE_VIDEO_SIGN_LANGUAGE	ACCESSIBLE VIDEO (SIGN LANGUAGE)
	VISUAL IMPAIRMENT	VIDEO DESCRIPTIVE TRANSCRIPT(1)_ENGLISH.DOCX	ACCESSIBLE_VIDEO_TRANSCRIPT	ACCESSIBLE VIDEO (TRANSCRIPT)
		VIDEO VISUAL IMPAIRMENT DESCRIPTIVE TRANSCRIPT(1)_GREEK.DOCX	ACCESSIBLE_VIDEO_TRANSCRIPT	ACCESSIBLE VIDEO (TRANSCRIPT)
		VIDEO VISUAL IMPAIRMENT DESCRIPTIVE TRANSCRIPT(1)_ITALIAN.DOCX	ACCESSIBLE_VIDEO_TRANSCRIPT	ACCESSIBLE VIDEO (TRANSCRIPT)
		VIDEO VISUAL IMPAIRMENT DESCRIPTIVE TRANSCRIPT(1)_SPANISH.DOCX	ACCESSIBLE_VIDEO_TRANSCRIPT	ACCESSIBLE VIDEO (TRANSCRIPT)

TASK R6.6: MAINTENANCE AND IMPROVEMENT OF THE REPOSITORY

Task R6.6 focused on the ongoing maintenance and final improvement of the repository to ensure that it remains functional, secure, and user-friendly. This task run concurrently with earlier stages, ensuring that the repository continues to meet the evolving needs of users. During this phase, any bugs or technical issues that arise was addressed, and the system was regularly updated to maintain its performance. The repository was be optimized for scalability to accommodate additional educational content as the project grows.