IO2 - A prototype of a digital tool to connect and network opportunities

HiLives

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TECHNICAL INFORMATION

TITLE

HiLives: Including and Connecting in Higher Education: networking opportunities for independent lives

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INTRODUCTION

Making higher education systems inclusive and connected to society requires providing the right conditions for the success of students with different types of needs (European Commission, 2019). In this sense, attention to students with disabilities is seen as a quality standard within the European Higher Education Area (Reyes et al., 2017). This challenge requires a paradigm shift in the higher education context, adding a sense of responsibility and adaptability to institutions and their human resources.

Turning higher education institutions (HEI) accessible for all students, including students with intellectual and developmental disabilities (IDD), is a challenge of modern times. As Barabas, (2020) states, applying "inclusion" in a real context and in a practical way, specifically the social and digital inclusion of students with IDD, is a real challenge.

In several countries, a diversity of inclusive educational programmes for people with IDD have been developed in universities (Martins et al., 2022). However, there is still a significant lack of training responses for young people with IDD, preparing them to be integrated into the labour market according to their abilities (Bougie, 2002; Reyes et al., 2017).

Several studies provide evidence that digital media can play a crucial role in promoting more inclusive social and learning experiences, particularly when considering the challenge of widening participation that HEI currently faces (Almeida et al., 2019; Bougie, 2002; O'Brolcháin & Gordijn, 2019). Equally important is the need to develop digital solutions that support these students, promoting inclusion and connection between academia and the labour world (Tymoshchuk et al., 2022). These digital tools can enable connection and networking, bridging gaps and mismatches between the expectations, skills, and needs of young adults with IDD, and both the HE offers and the employment opportunities (Chalegre & Almeida, 2020).

In response to the need to promote inclusive higher education and incorporate new technologies into teaching and learning practices, a collaborative European partnership has established the project HiLives: Including and Connecting in Higher Education: networking opportunities for independent lives. This partnership includes four Higher Education Institutions (HEIs): University of Aveiro, Portugal; University of Ghent, Belgium; University of Salamanca, Spain; and University of Iceland, Iceland). The other four partners are Portuguese Associations that work directly with young adults with IDD and their families (ASSOL, Pais-em-Rede, FORMEM and AvisPT21).

The HiLives project has three main goals. First, it aims to promote the inclusion of students with IDD in higher education institutions. The second aim is to improve the transition to an active and

independent life, exploring the role of digital media in this process. The third objective is to develop a prototype of a digital tool to connect and network opportunities, tackling gaps and mismatches between the expectations, skills and needs of young adults with IDD, and both the HE offers and the employment opportunities.

It is important to note that the project occurred in the context of the Covid-19 pandemic. As in all aspects of life, the project team had to adjust to the Covid-19 pandemic, especially in how researchers conducted end-user testing and the prototype delivery date.

INTELLECTUAL OUTPUT 2 (IO2) - A PROTOTYPE OF A DIGITAL TOOL TO CONNECT AND NETWORK OPPORTUNITIES

This report integrates the intellectual output 2 (IO2) achievements, which aims to create the prototype of a digital tool to facilitate connections and networking opportunities, bridging gaps and mismatches between the expectations, skills, and needs of young adults with IDD, and both Higher Education provision and employment opportunities.

Although this project focuses on the need for inclusion of people with IDD, it also intends to include other stakeholders, namely: higher education institutions, associations, and also companies. Promoting the participation of these three stakeholders is fundamental when using a Person-Centered Approach, and when aiming at developing a prototype of an accessible digital solution.

Therefore, the HiLives platform aims to:

- Ensure mutual matching between disabled people and vacancies published by employers, taking into account not only technical skills but also, and with the same degree of importance, behavioural skills;
- Provide recommendations for technical and behavioural learning pathways, so people can achieve the requirements of the vacancies through professional and/or academic qualifications;
- Encourage interaction between applicants, company employees and the external audience, so that the placement of people with disabilities is carried out in an accessible and inclusive way.

The IO2 development work started in the first quarter of 2020, with the organisation, a study of user needs, and a literature review to establish the state of the art and to benchmark other digital tools. This was followed by work aimed at analysing needs in consultation with stakeholders (students, families, associations, HEIs, and employers).

The next step was the design and specification of the HiLives platform, which included Use Cases and User Stories, Functional and Technical Requirements, a Technical Feasibility study, Content and Information Architecture, and Content Translation for each partner's native language.

Based on this specification, the concept and Mock-ups of the platform were developed, including Graphic Identity and Interface Design, Proof of Concept, and Mock-ups production and validation. These procedures allowed the prototyping of the Plataforma HiLives.

In the next step, acceptance, accessibility, and usability tests of the Prototype and validation of the Prototype were carried out. In September 2022, the project team carried out the online publication of the Prototype of a digital tool.

It is hoped that this digital tool will allow young/adults with IDD interested in HEI, by registering their preferences in profiles, to find a match with opportunities to study at a specific university. It will also allow universities to register and present inclusion/curricular opportunities.

The tool will also allow finding employment opportunities and support the ongoing decision-making processes, monitoring progress on both HEI and Employment dimensions.

This intellectual production counted with the involvement of all project partners and benefited from the knowledge acquired during the activities developed within the project. It is also closely related to the other intellectual products generated in HiLives: a Framework for developing an inclusive curriculum in Higher Education (IO1) and a Transnational / European good practice guide for Higher Education Institutions, Secondary Schools and Employers, aiming to help young adults with IDD to access Higher Education and to start an independent life (IO3).

METHOD

The challenge for this IO2 was to find out what characteristics a digital solution should have to promote the "mutual matching" between disabled people's skills and labour market opportunities.

Being a specific platform for people with IDD, it was necessary to adopt methods and procedures using a Person-Centered approach (Woo et al., 2018). Methods were adopted that favoured the direct participation of the target audience and all partners involved in the project: interviews, usability tests and questionnaires. This approach allows the platform to be designed according to the target audience's needs. This way, the Person-Centered approach allows errors to be identified early in the project, making it simpler to adapt and correct them.

The research team developed this study based on User Centered Design (UCD), a methodology that focuses on the conception for and involvement of users in designing digital technologies (Monk, 2000; Norman & Nielsen, 2006).

According to Heinilä et al. (2005), the purpose of UCD is to "involve end-users in the development process, understanding the needs of users early in the design and development process, providing guidance for designing a product that will meet user needs" (p.6).

The research described in this report has been carried out through a mixed methods approach, which integrates quantitative and qualitative techniques. These methods allow the investigation of multifaceted phenomena in innovative ways, reducing the weaknesses linked to mono methods, improving the validity and reliability of the results, and enriching the understanding of the studied phenomena (Sankaran & Cameron, 2015).

The HiLives platform prototype was developed following the W3C international accessibility guidelines, which require that all websites, tools, and technologies are developed so that they can be accessed by anyone, regardless of whether they have a disability or not. Thus, these people can "perceive, understand, navigate and interact with the web" (W3C, 2021a, para 4) and contribute to the web's advancement.

More recently, specifically in April 2021, the W3C published a note related to accessibility for users with IDD. Thus, this W3C (2021b) highlights that the main problems affecting people with IDD are design, context, page structure, language, and usability. This W3C has defined standards that should be followed to avoid a barrier between the web platform and the user with IDD.

Therefore, so that the digital platforms can meet the needs of people with DID, the W3C (2021b) has identified the following main topics: (i) helping users understand interfaces and how to use

them; (ii) helping users find what they need; (iii) using explicit content (text, images, and media); (iv) helping users avoid errors; (v) helping users concentrate; (vi) ensuring processes are not memory dependent; (vii) providing help and support; (viii) supporting adaptation and personalisation; and (ix) testing with real users (W3C, 2021b).

As it can be seen in Figure 1, the study presented was developed in the following complementary stages:

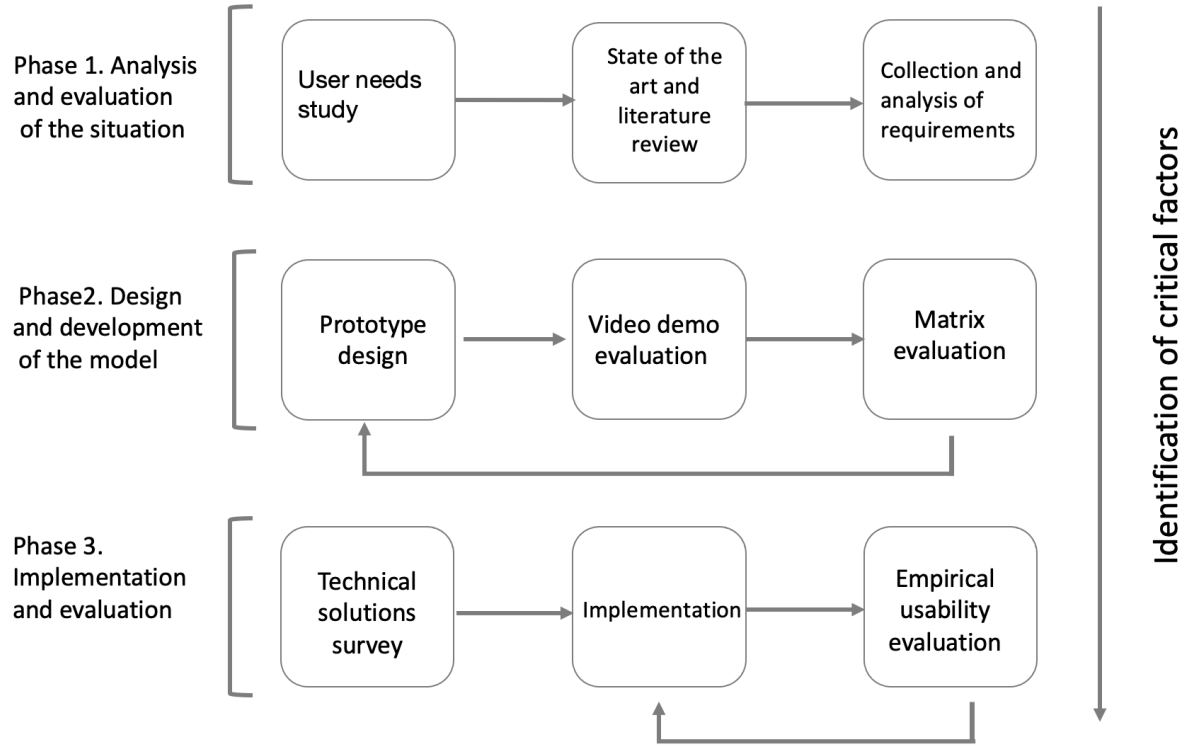


Figure 1 Research Steps

Phase 1. Analysis and evaluation of the situation integrated the following procedures:

- User needs study through the completion of an asynchronous online survey, semi-structured interviews with people with disabilities, associations, and companies as well as observation - the creation of a Logbook;
- State of the art and literature review through the benchmarking and analysis of existing platforms, under the perspective of accessibility, usability, participative culture and functionalities;
- Collection and analysis of requirements - analysis of the requirements elicited for the development of the platform.

Phase 2. Design and development of the model - This phase served to start the hi-fi prototype development based on what had already been collected during the first phase. In addition, two data collection moments were carried out: an evaluation by video demo and an evaluation by matrix.

Phase 3. Implementation and evaluation - In this phase, the objectives were to implement the final product at the back-end and front-end levels. As such, surveying the technologies/technical solutions was essential to understanding which programming language would best suit the intended functionalities.

Next, the project team conducted the usability evaluation, where end users interacted with the developed product. This evaluation had as objectives: i) Identification of interaction difficulties that could be detrimental to the user experience; ii) Identification of improvements that the development team could make; iii) Understanding whether or not the platform was accessible for people with IDD; iv) Identification of good accessibility practices for developing accessible web platforms for people with IDD.

Table 1 Data collection instruments applied

Phase 1	Benchmarking and analysis of existing platforms	Evaluation of accessibility through two free platforms: Access Monitor2 and Wave3	1.02-8.03. 2021	12 platforms	Qualitative data
	Survey by questionnaire	Collection of requirements	2.02-8.03.2021	12 partners	Qualitative data
	Survey by questionnaire	Explore the patterns of use and difficulties in using digital technologies experienced by people with IDD	15.04 - 30.07. 2021	78 people with IDD	Quantitative data

Phase 2	Video demo evaluation	SUS usability scale	7.05 - 14.07. 2021	48 participants (15 partners; 13 HEs and 11 business representatives).	Qualitative and quantitative data
	Matrix evaluation	Two matrices or two evaluation grids	24.11-10.12.2021	29 participants (21 were partners and 8 were people with IDD)	Qualitative and quantitative data
Phase 3	Accessibility and Usability Evaluation	SUS usability scale	7.06-28.09.2022	20 students with IDD	Qualitative and quantitative data

This research was developed in articulation with:

- a thesis of the Doctorate Programme in Information and Communication on Digital Platforms (ICPD) entitled "Digital Solution Proposal for the Promotion of Employability of People with Disabilities" developed by the student Virginia Chalegre;
- b) a master's thesis in Multimedia Communication entitled "Digital Accessibility in Recommendation Platforms for the inclusion of People with Intellectual and Developmental Disabilities: critical factors and good practices for the development of an accessible Web Platform" developed by Ana Filipa Santos Ferreira.

KEY FINDINGS

The data collected during the study allowed the development and evaluation of the prototype of a digital platform whose main objective is to connect and network opportunities, tackling gaps and mismatches between the expectations, skills and needs of young adults with IDD and both the HE offers and the employment opportunities. This report presents the analysis of the main findings of this study by research phases to facilitate understanding of the results.

4.1 Phase 1. Analysis and evaluation of the situation

The first phase of the research aimed to understand the problem and carry out an initial collection of requirements based on a literature review and a state-of-the-art survey.

4.1.1 Benchmarking

Initially, a state of the art survey was carried out through the benchmarking of 12 existing platforms: three Platforms for the dissemination of vacancies in the labour market (InfoJobs; Zaask; SEMEAR); two Platforms for the promotion of learning paths (Coursera; Trailhead); 2 Platforms for publicising learning paths and vacancies in the labour market (IEFP online; Cidade das Profissões); three Recommendation platforms based on user characteristics (Tinder; Linkedin; Valor T); two Platforms designed and developed specifically for People with IDD: Pais Em Rede; CareLogic). The project team identified these platforms with the support of all partners by applying the Questionnaire survey to collect requirements and the state-of-the-art/benchmarking (Annex I).

After carrying out the Benchmarking, it was possible to conclude some functional requirements for the HiLives Platform (Annex II). Thus, the functionalities proposed were:

- Creation of vacancies by companies;
- Creation of courses by the HEIs;
- Recommendation of learning paths and vacancies in the labour market based on the characteristics of IDD;
- Viewing user profiles, whereby IDD can only view those of Universities and Companies;
- Possibility of registering and logging on to the platform, foreseeing three types of users that can register (People with IDD, HEIs and companies);
- Possibility of sharing experiences with other users, which can be done through text, video, audio or photography;

- Availability of the Platform in several languages - Flemish, English, Icelandic, Portuguese and Spanish.

4.1.2 Survey of usage patterns and difficulties in using digital technologies

In parallel, the project team applied an online questionnaire to explore patterns of use and difficulties in using digital technologies experienced by people with IDD. Seventy-eight people with IDD completed this questionnaire.

This study demonstrates that most people with IDD who participated in this study already use digital technologies frequently. The mobile phone is the most used equipment to access the Internet and use different applications (Table 2).

Table 2 Frequency of use of mobile phone, computer, and tablet

Technological equipment	Never	Rarely	1-2 days a week	3-5 days a week	Every day
Cell phone/smartphone	1	5	1	5	66
Tablet	45	6	6	3	18
Computer	11	12	15	8	32

Among the activities they carry out with the support of digital technologies, participants highlighted Internet researching, watching videos, listening to music, using social media, and playing games. Only a few respondents use digital technologies to study or to use educational programs (Tymoshchuk et al., 2022).

Concerning the technologies/apps they feel comfortable with, they refer to social media, the e-mail, video conferencing, and word processing. However, most respondents also mentioned that they feel "not comfortable at all" using various tools: spreadsheets, cloud storage services, video editing programs, image drawing/editing programs, and presentations (Table 3).

Table 3 Difficulty/Easiness to use different technologies and applications

Digital technologies	Nothing at ease	Uncomfortable	Make yourself comfortable	Very comfortable

Social networks (Facebook, Instagram, WhatsApp, TikTok)	8	14	23	33
Blogs/websites	32	13	19	14
email	25	15	21	17
Text creation program (e.g., word)	25	18	22	13
Image/photo drawing/editing program (e.g., Paint)	47	13	13	5
Video editing program (Movie Maker)	48	13	15	2
Video conference program (Zoom, Google Meet, Teams)	28	14	21	15
Cloud storage services (OneDrive, Google Drive, Dropbox)	51	12	11	4
Production of presentations/slides (e.g., PowerPoint, Prezi)	43	17	12	6
Spreadsheet (ex.: excel)	59	11	4	4

We also wanted to analise the factors that facilitate or are a barrier to the process of learning and using digital technologies. As essential facilitators in developing their digital skills, participants highlighted the support of the school, family, friends, and associations they attend. Barriers to this process include difficulties in reading, lack of training courses in digital technologies adapted to their conditions, lack of support in using these technologies, and, in some cases, lack of access to the Internet. This study also collected information on the technologies/applications that participants with IDD would like to learn more about, specifically how to use them: video editing, video conferencing, oral presentation, graphic editing, the e-mail, and word processing (Table 4).

Table 4 Digital technologies/applications that respondents would like to learn to use

Digital technologies/applications	Number of participants
Use cloud services (Google Drive, Dropbox)	23
Use email applications (Gmail, Hotmail)	28
Use graphic editing applications (Paint; Photoshop)	29
Use presentation applications (PowerPoint, Prezi)	29
Use social networks (Facebook, TikTok)	17
Use spreadsheet (Excel)	17
Use video conferencing applications (Zoom, Google Meet, Teams)	37
Use video editing applications (Movie Maker)	40
Use word processing applications (Word)	25
Use website/blog	21

This study demonstrates the need to implement new approaches to promote the digital inclusion of people with IDD, ensuring that they have access to digital technologies and the possibility of learning to use them flexibly and respecting their characteristics and abilities. Moreover, the results of this study highlight the importance of developing support networks that involve school, family, and community that can offer a range of initiatives to promote the digital and social inclusion of individuals with IDD. Although the sample in this study was relatively small, the results raised essential questions regarding the digital skills of people with IDD and the barriers they face in using technologies. This understanding is vital for making decisions and developing projects to reduce their info-exclusion and to ensure adequate public services, education, and employment access.

4.1.3. Collection of requirements

In this step, the researchers carried out requirements gathering from partners. This questionnaire was completed by 12 people, with at least one partner per country completing the survey (Annex I).

Listing requirements is a critical step when creating digital projects since it allows early management of the project priorities, as mentioned by Mendes et al., (2015). In this study, the requirements emerged from the target audience's needs demonstrated in the data collection methods and data collected in state of the art. The accomplishment of these tasks allowed us to elaborate a list of requirements for the HilLives platform (Table 5).

Table 5 Functional requirements suggested by the partners

N	List of requirements	Descriptions
1. List of requirements of persons with IDD		
R1.1	Person Register	Information about personal, academic, and professional experience.
R1.2	Profile Management	To edit /complement the information about courses, new work experiences and all the information available on the register.
R1.3	History Upload	History Upload: The platform indicates that the person can record a video, talking about their interests, experiences, and expectations.
R1.4	Links with HEs	The result of HEs course matching, according to the areas of interest, country, and region.
R1.5	Links with Companies	The result of matching the person profile with job vacancies requirements. The considered parameters are areas of interest, country, region, favourite working environments, academic qualifications and working hours.
R1.6	Recommendation of learning paths	The platform shows recommendations of courses, when the matching between persons and job vacancies is not 100%. This requirement is one of main features of this platform, because it indicates to the persons which paths they can follow, so that they can improve their qualifications and correspond to the needs of the companies, based on their profiles.
R1.7	View Courses/Vacancies	The users can access vacancies published by Companies or courses available at HEs, even if they are not the result of the platform matching.
R1.8	Notification of connections	When there is a new connection with a job vacancy or course, the person receives a notification.
2. List of requirements of Higher Education Institutions		
R2.1	HEI Register	Basic information about HEI.
R2.2	Complete the profile	To fill the lack of information about the HEI's profile.
R2.3	Register the course(s)	To register the course(s) details for IDD people.
R2.4	Manage course(s)	It's possible to update/delete the published course(s).
R2.5	View the Connections	It's possible to see all connections created automatically for this platform, according to the parameters filled by people with IDD.

R2.6	View the HiLives stories	Page to see the videos that demonstrate the academic and professional experiences of other HiLives users, as well as the environment of companies or universities
3. List of requirements of Companies		
R3.1	Company Register	Basic information about the company.
R3.2	Job Vacancy Register	Job vacancy creation with information and requirements.
R3.3	Manage Vacancies	It's possible to update/delete the published vacancies.
R3.4	Profile Management	It's possible to see and edit the data about the company.
R3.5	See My Candidates	All links to candidates for job vacancies, where they meet all the requirements and capabilities needed to apply and the candidates for vacancies where only two or three skills are missing.
R3.6	View the HiLives stories	Page to see the videos that demonstrate the academic and professional experiences of other HiLives users, as well as the environment of companies or universities.
4. List of general requirements		
R4.1	Tutorial	When logging in for the first time, the users have access to a short video explaining how to use the application.
R4.2	Contact	If the user has a Doubt/Suggestion, he/she can send a message via contact form.
R4.3	Accessibility Link	The accessibility link is available on the page footer and describes the accessibility of the platform and how it is organised with the links and page structure.
R4.4	Accessibility Icon	There is an accessibility icon available at the bottom of the pages, with different features.

4.2 Phase 2. Design and development of the model

The second phase started by constructing the hi-fi prototype based on the inputs collected during the first phase.

4.2.1 Prototype design

The prototype of the HiLives platform mas developed from the beginning in a digital format, using Adobe XD and later Figma software, which allowed designing a proposal as close as possible to the real solution. The platform features three main profiles: Person, University and Company, as shown in Figure 2.

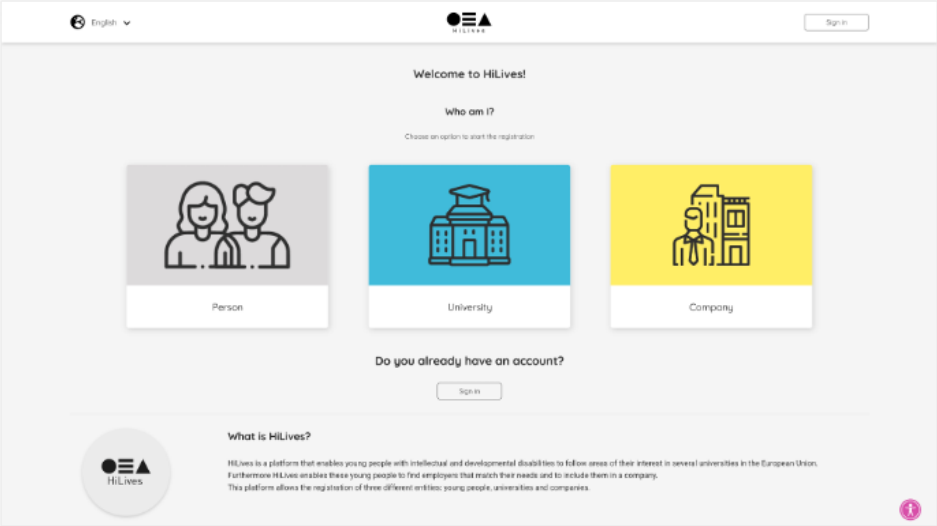


Figure 2 First version of the hi-fi prototype

Initially, users are on the homepage, with the option to register on the platform or to log in. Once logged in, in the case of People with IDD, users have access to the following:

- Links to courses and vacancies, where more detailed Information on both offers can be accessed;
- Stories, where users can post their stories;
- Profile, where users can edit their profile or add courses (Figure 3).

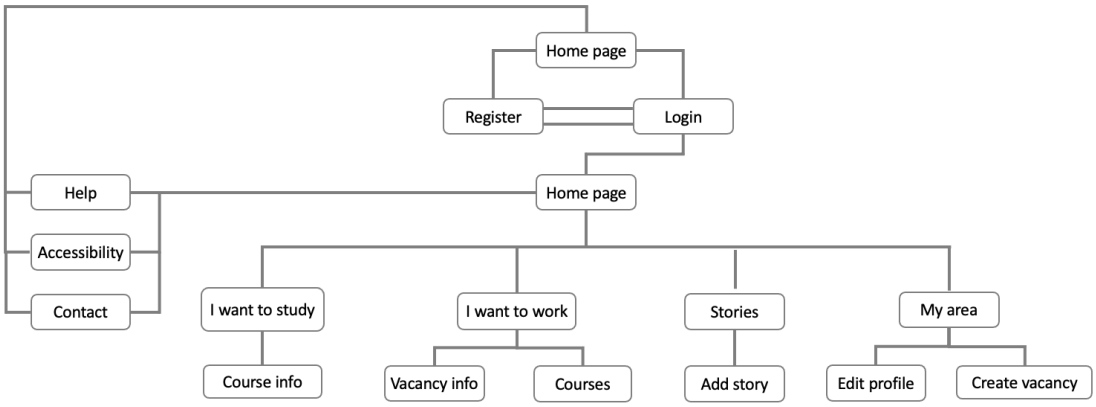


Figure 3 Structure of the prototype navigation - Person with IDD

Once logged in, HEIs have access to the following:

- their links with PwD, viewing their profiles;
- the courses they have published, with the opportunity to add a new course or view/edit the information published;
- and all the vacancies published by companies, with the opportunity to view more information about them.

The remaining pages are like those of IDD users, as shown in Figure 4.

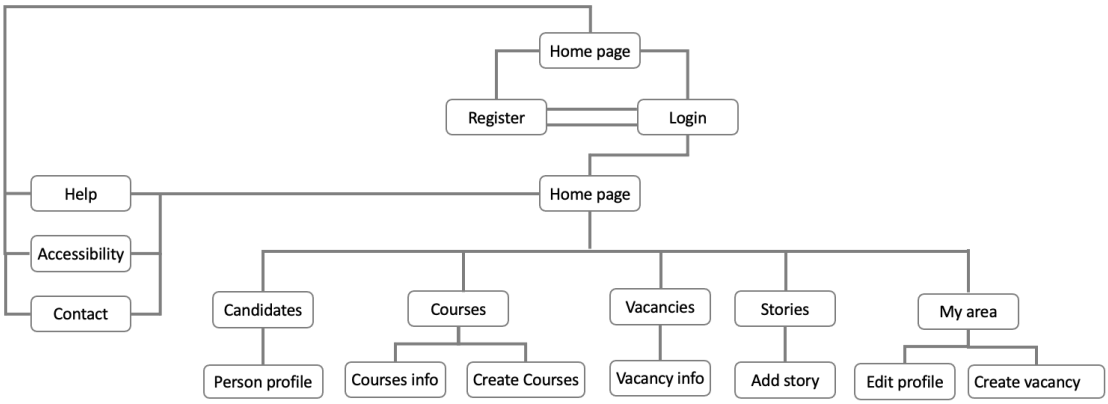


Figure 4 Structure of the prototype navigation - HEI

Once logged in, companies can access their connections with people with IDD and consult their educational and professional background. Moreover, they can see their vacancies published, add new vacancies, or view their information. They also have access to HiLives stories and can share

their publications (Figure 5). In their personal area, they can edit their information or add new vacancies.

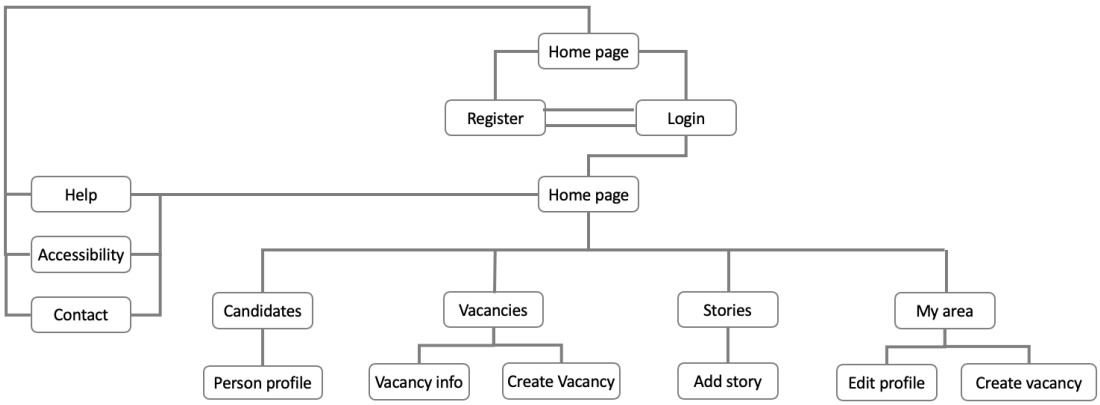


Figure 5 Structure of the prototype navigation - Companies

All the screens of the platform have the navigation bar and the footer in common. When no session starts, the navigation bar (Figure 6) shows only three elements: the menu to select the language, the logo, and the login button.

Figure 6 Navigation bar not logged in

In the navigation bar (Figure 7), four elements are displayed when the user is logged in: the side menu, the logo, the notifications, and the user menu. In addition, a secondary navigation bar displays the same options as the open side menu.

Figure 7 Navigation bar with Login

Following this, the researchers conducted two data collection moments with the partners' support: a video demonstration evaluation; and a matrix evaluation. The objectives of these

evaluations were to identify the following: i) the improvements to be made; ii) the interaction problems detrimental to the user experience, and iii) new requirements to be introduced.

Then, with the partners' support, the researchers carried out two moments of data collection: an evaluation of the prototype through the video demonstration; and an evaluation of the prototype using a matrix.

4.2.2 Evaluation by a demonstration video

For this evaluation, a demonstration video of the prototype produced in Adobe XD was made, as due to the pandemic, direct monitoring of the participants would not be possible (Annex III).

Next, the project team developed the Evaluation Protocols for People with IDD (Annex IV), Companies and Higher Education Institutions (Annex V) and questionnaires to apply to the participants after the video demonstration (Annex VI and Annex VII).

From this last video-based questionnaire, it became possible to deepen the involvement of the end-users in each of the different countries. To work with partners, an XLS file was created and divided into five different sheets: one with the requirements of people with IDD, one with those of HEIs, one for Companies, one with general requirements and a sheet that allowed collecting new suggestions that were not present yet. Additionally, to harmonise data collection among all project partners, three protocols were created, each corresponding to a questionnaire for each end-user. These protocols address questions regarding the complexity and consistency of the visualised prototype, the functionalities thought out, and pertinent suggestions to include in the prototype. Regarding protocols, it is understood that these are necessary when conducting the questionnaires and similarly obtaining data.

This evaluation occurred at two different times, the first between May 7th and 27th, 2021, and the second between June 21st and July 14th, 2021. The researchers obtained data from 48 participants, out of which 15 were partners, 9 were People with IDD, 13 were HEIs and 11 were companies. Therefore, the video demonstrated and explained all the functionalities of the platform (Annex III). In addition, a questionnaire survey was prepared to be answered at the end of the test (Annex IV and Annex V). This survey adopted some of the SUS (System Usability Scale) questions.

This evaluation allowed the researchers to identify the necessary improvements, so that the prototype would better meet the users' expectations. In Table 6 it is possible to observe the points identified by the respondents.

Table 6 Improvements on the HiLives platform

Improvements	
1.	More images should be used on the platform.
2.	More colours should be used so that it is not a grey platform.
3.	The platform has a very formal look. It would be interesting if this was changed for people with IDD, although it can be kept for HEIs and companies.
4.	The font size should be increased.
5.	There should be an audio system, so that blind people can use the platform.
6.	More accessible language, should be used i.e. one that can be understood by IDD.
7.	A digital guide explaining the main features and how they are expected to be used should be added.
8.	More explicit icons should be used.
9.	In addition to receiving notifications on the platform, it would be interesting to receive them by email.
10.	Instead of having a duplicate menu, it should be unified and appear only once.
11.	Line spacing in longer texts should be increased.

After analysing the improvements pointed out by the respondents, the researchers proceeded with the correction of the prototype. All spacing and font size suggestions were considered and corrected.

The researchers also chose to remove the side menu and keep the idea of two navigation bars (Figure 8).

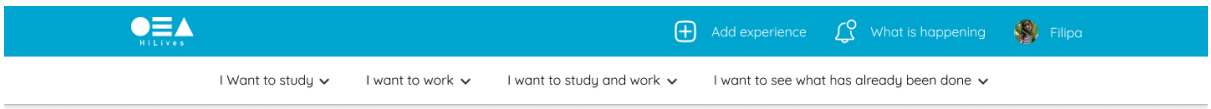


Figure 8 New version of the navigation bar after evaluation by video demo

These two bars would follow the user's scroll, and the user would always have a view of the main pages of the prototype. Additionally, it was decided to remove the overlapping tabs with cards in the profile as well as in the course and vacancies information pages.

At this moment, it was also necessary to transition the prototype from Adobe XD to Figma due to the limitation of creating links that Adobe XD presented.

4.2.3 Results of the matrix evaluation

Next, the project team performed a matrix evaluation after users directly explored the prototype (Annex IX). This evaluation occurred between November 24th and December 10th, 2021 and included 29 participants, out of which 21 were partners and eight were People with IDD.

The results of this evaluation are presented in Figure 9, which exemplifies how the evaluations of the following functionalities were assigned: Menu view, Register, View courses, View job vacancies, Set as favourites, and Video Upload.

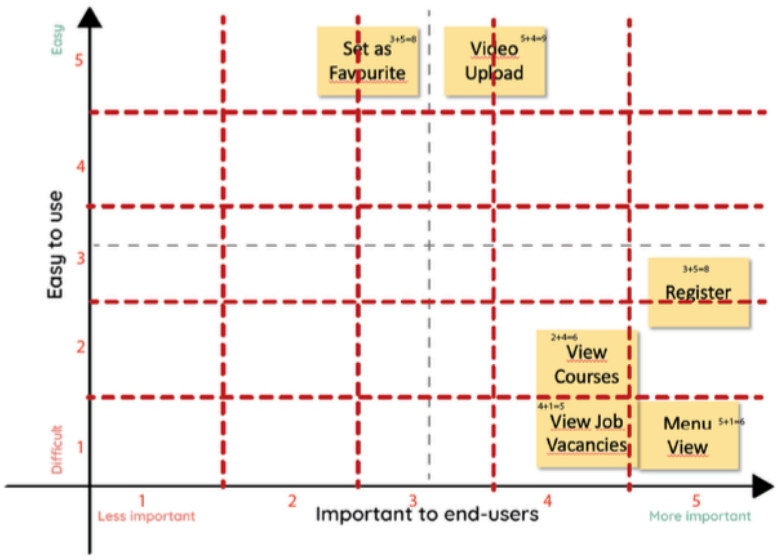


Figure 9 Example of how the evaluation was assigned to each functionality in the matrix

The researchers collected some further suggestions for changes to the prototype from these evaluations to make it as simple as possible. Table 7 presents the points identified by the respondents.

Table 7 Improvements for the HiLives platform identified during the matrix evaluation

Suggested improvements	
1.	The register of People with DID is a little complex to be filled in autonomously.
2.	It would be interesting to have a mediator between the user and the platform to fill the more complex fields.
3.	The navigation should be simplified.
4.	The available information should be simplified.
5.	Besides being able to post a video, users should be able to share their experiences in other formats, such as audio, images or just text.
6.	The favourites feature does not seem to be relevant on the platform and may not be understood by everyone.
7.	The translation option should be available more often throughout the interaction with the platform.
8.	It would be interesting if the platform presented more images.
9.	Users are not sure where they are while they navigate in the platform, so this information should be added.
10.	There could be a way to upload videos from Youtube.

4.3 Phase 3. Implementation and evaluation

After evaluating the matrix, the project team realised that the prototype needed a significant overhaul, including some functionalities.

4.3.1 Technical solution survey

Before redesigning the prototype, the researchers performed a colour contrast test using the Color.review software. In this sense, when analysing the colours (blue, yellow and pink) used, it was realised that these did not pass the minimum contrast requirements.

This way, the researchers needed to rethink the colour palette to ensure the recommended contrast. To do this, the researchers used the original shades and adjusted the Color.review palette until the required contrast was achieved (Figure 10).

Figure 10 HiLives colour palette that passes the contrast tests

The researchers made the following main changes, considering the respondents' suggestions (Figure 11):

- changing the navigation bar allows accessing the platform features from any page;
- all dropdowns and page splits have been eliminated to reduce the number of taps/clicks;
- the notifications were eliminated as it was considered not to be a relevant feature;
- the cards showing user connections have also been simplified, so that they could stand out better from the HEI or company cards.

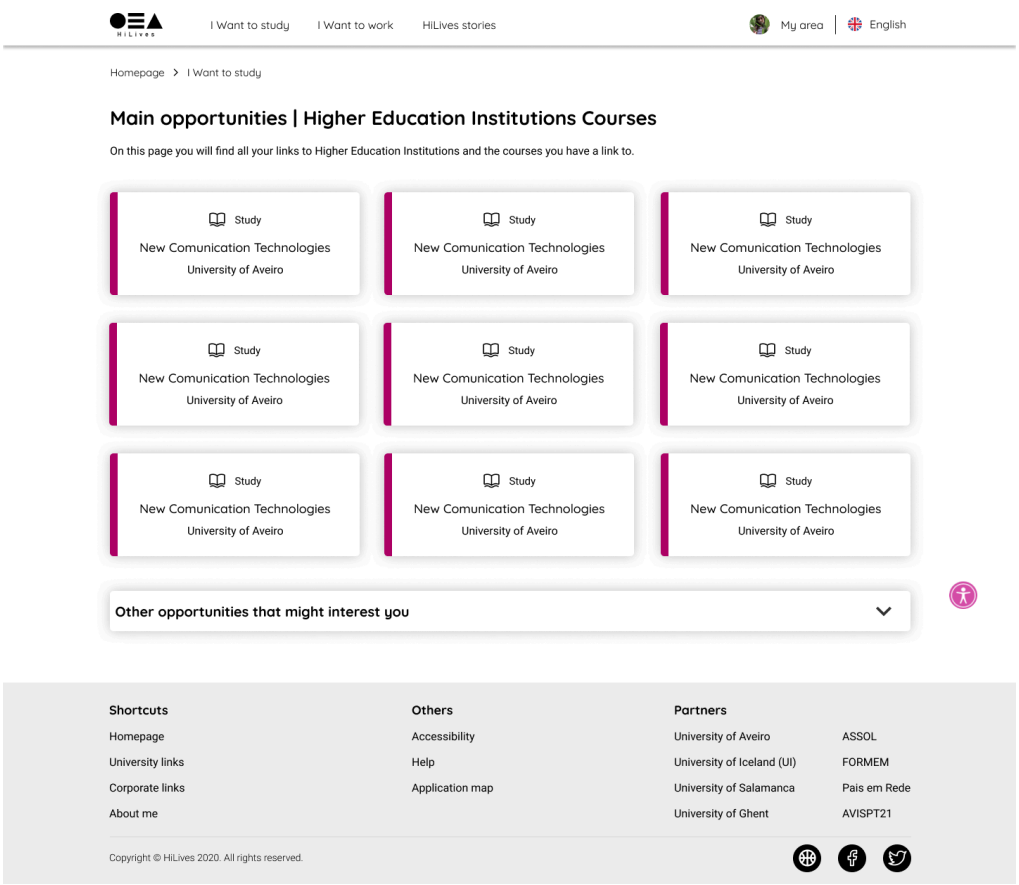


Figure 11 Latest version of the Hilives platform

The project team also decided to take advantage of the main colours of the platform and represent the contents related to the study in pink shades and the ones related to the labour market in blue. Besides that, the researchers decided to use blue as the main colour of the platform, using it whenever it is necessary to highlight some information.

In addition, the researchers created a fourth agent in the platform, the Tutor, to simplify the registration and consider the partners' improvements. The Tutor will be responsible for mediating the access of the Person with IDD to the platform. That is, when registering, the Person with IDD fills in only the most straightforward fields, such as name, e-mail and mobile phone number. At the end of the registration, they receive a message on the platform, mentioning that a responsible person will contact them before accessing it. In due time, the Tutor will contact them and fill in the remaining mandatory but complex fields so that they gain access to HiLives.

4.3.2 Implementation

Next, the project team implemented the functional prototype using HTML, CSS and Bootstrap for the integral development of the front end. The researchers used PHP and SQL programming languages to develop the back end. JavaScript was also used, also considering the Ajax and the jQuery function library. Additionally, the team resorted to the UserWay plugin, considering that this research theme focused on digital accessibility. This way, the team added several accessibility functionalities to the platform, such as increasing contrast and text size.

After designing the HiLives architecture, the researchers built the platform database using MySQL Workbench software. The platform database displayed all the tables and established all the connections (Figure 12).

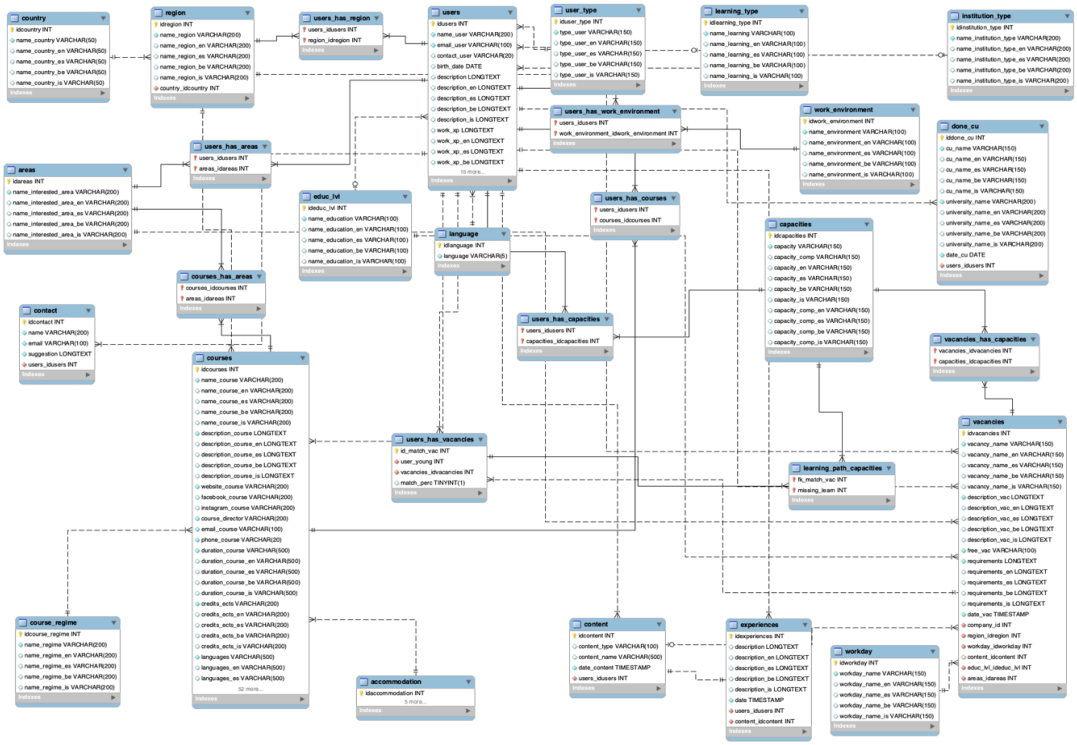


Figure 12 HiLives platform database

Furthermore, the project team translated all the pages and contents of the platform into five languages: Spanish, Flemish, English, Icelandic, and Portuguese. The project partners have provided translations of the contents (Annex X).

The functional prototype is accessible through the link: http://apphilives.web.ua.pt, where different user types can be seen (Table 8).

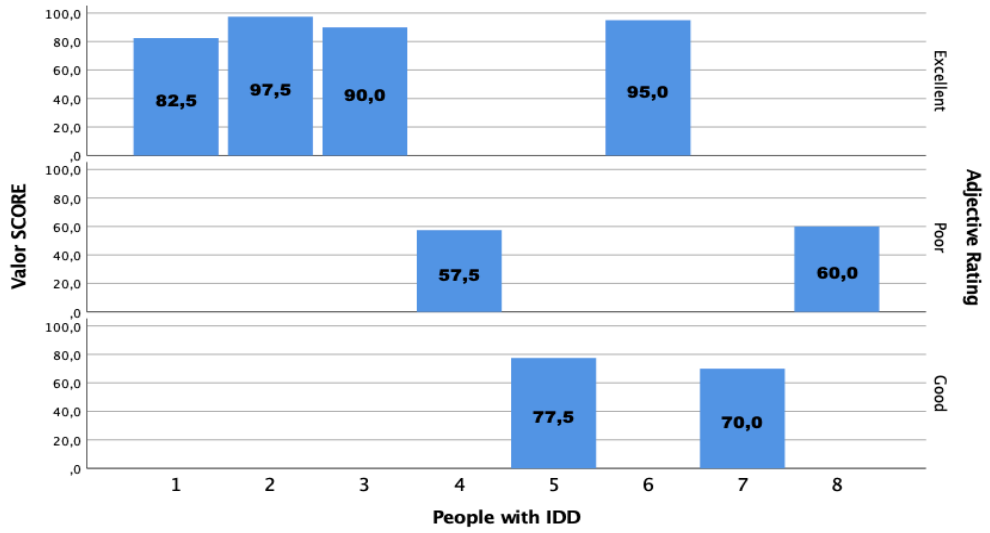
Table 8 Different user types

User model "Person"	
E-mail	pessoa@pessoa.com
Password	pessoa
User model "Higher Education Institution	
E-mail	ies@ies.com
Password	ies
User model "Company"	
E-mail	empresa@empresa.com
Password	empresa
User model "Tutor"	
E-mail	tutor@tutor.com
Password	tutor
User model "Administrator"	
E-mail	admin@admin.com
Password	admin

4.3.3 Accessibility and usability assessment

The project team conducted a usability and accessibility assessment to identify problems in the design of the user interface. These tests took place between June 7th and September 28th, 2022, and were attended by 20 People with IDD (Belgium, Iceland, Spain, and Portugal).

The evaluation instrument was the System Usability Scale (SUS), a widely used instrument for identifying system usability issues (Martins et al., 2015). In addition to the ten questions of the SUS scale, the researchers added some open questions related to suggestions for improving the platform. The main results concerning the application of SUS are shown in Graphic 1.



Graphic 1 Example of how the evaluation was assigned to each functionality in the matrix

The SUS results show that, in terms of usability characteristics, the prototype is at a good level, according to the participants' opinion (78,75 points). According to Sauro (2011), the System Usability Score average is 68 points. In this sense, if the score is lower than this value, the product probably faces usability problems, since it is below average (Barbosa, 2019; Sauro, 2011). Therefore, a score between 70 and 80 in SUS corresponds to good usability (Barbosa, 2019), reflected, in the case of the Hilives prototype, on the global result of 78,75 scores.

Additionally, during these tests, students with IDD reported some improvements that should be implemented (Table 9).

Table 9 Improvements to be implemented according to the empirical usability evaluation

Suggested improvements	
1.	In addition to the existing options, the navigation bar should have the option "Home page" written on it, so that better understanding of how to return to that page is promoted.
2.	The tabs should have a highlighted colour instead of using black when they are active. This way, it will be more noticeable which one is active.
3.	The buttons with the "?" should appear in more places in the platform to give hints to the users.
4.	The button to add a course and/or Course Unit in the profile should appear more at the top of the page.
5.	Cards on the links page should have a button with text like "see more information" to show that more information can be seen through them.
6.	It would be interesting if it were possible to select more than one country to study or work in.

Therefore, the usability and accessibility tests allowed us to verify and correct the functionalities that had some errors in the prototype design, making the platform more accessible to people with IDD. In addition, it was also possible to understand the importance of the proposed functionalities for people with IDD and other stakeholders.

CONCLUSION

There is still much work ahead to raise awareness in Higher Education Institutions and Companies for the inclusion of people with IDD. In this context, designing a digital platform that allows a match between People with IDD, Higher Education, and companies is an emerging challenge.

The HiLives platform intends to contribute to this path and shows that these people have a lot to offer at the academic and business levels. The study's findings highlight the benefits of using a person-centred approach when developing research and the importance of involving people with IDD and different stakeholders.

This study also proved the involvement of the people with IDD and stakeholders is crucial for the future solution´s success. It is essential to include them in all stages of the process. It is also important to give them full access to digital platforms: many of the solutions analysed are not prepared for people with disabilities and do not comply with the Web Content Accessibility Guidelines (WCAG) from the W3C. The need for developing a platform that is as inclusive as possible has become more and more of a priority over time.

This report presents the design process, the prototyping and evaluation of the HiLives platform that aims to promote the inclusion of people with IDD in Higher Education Institutions and in the world of work.

In the first phase, entitled situation analysis and assessment, the project team conducted the requirements survey based on state of the art and a moment of data collection from partners. In the second phase, the researchers started the construction of the hi-fi prototype. In this phase, the project team also performed two moments of data collection, one through a demo video and the other through a matrix. The last phase, called implementation and evaluation, aims to develop the functional prototype. For this, the researchers implemented the prototype and evaluated it with potential end users (people with IDD and companies as well as higher education institutions).

Carrying out the accessibility and usability tests allowed the adjustment of the requirements and the validation of the platform design. The main results of these tests were the following:

- The need to ensure cleaner and easier-to-use design solutions on the interface for the registration of people with IDD, reducing the number of fields they needed to fill in;
- Users should have easy access to the main pages of the platform, avoiding the use of dropdown menus;

- The platform should contain more images and icons to make it more appealing to people with IDD;
- The need to simplify some of the terms used so that people with IDD could understand them better;
- When it comes to publishing stories of the experience of people with IDD, this should be possible through different formats such as text, images and audio, besides videos.

The study findings highlight the benefits of using a person-centered approach when developing research and the importance of involving people with IDD and different stakeholders.

The project team promoted the various communication and dissemination activities carried out throughout the HiLives Project, which was seen as fundamental for disseminating the project to the broader academia, the business world, and the community. The most important actions include:

- Almeida, A.M., Sousa, P., Machado, M., & Chalegre, V. (2019). HiLives: a digital tool to connect and network opportunities for independent lives in Higher Education". In *51st EUCEN Conference University Lifelong Learning to Live a Better Life - Continuing Education for Sustainable Quality of Life in Europe*, 2019.
- Chalegre V.C., Almeida A.M. (2020). Avaliação de Aplicações para a Qualificação e Empregabilidade de Pessoas com Deficiência. *Journal of Digital Media & Interaction 3* (9), 122-132
- Almeida A.M., Ferreira, A.F. & Chalegre V.C. (2022). Involving end-users in the design of a digital platform for Including People with Intellectual and Developmental Disabilities in Higher Education and Employment: preliminary findings. In the 10th *International Conference on Software Development and Technologies for Enhancing Accessibility and Fighting Info-exclusion (DSAI22).* (In press)
- Tymoshchuk, O., Martins, I. C., Cartuxo, C.R., Albuquerque, E. & Almeida, A.M. (2022). Digital technologies as a promotor of well-being and inclusion of people with intellectual and developmental disabilities: what is the current situation? In the 10th *International Conference on Software Development and Technologies for Enhancing Accessibility and Fighting Info-exclusion (DSAI22).* (In press).
- Martins, I. C., Tymoshchuk, O., Albuquerque, E., Santos, P., & Van Hove, G. (2022). Parents' Voices: Inclusion of Students with Intellectual and Developmental Disabilities in Higher

Education. *In Conference on Smart Learning Ecosystems and Regional Development* (pp. 157-175). Springer, Singapore.

Production of a master's thesis and a doctoral dissertation:

- Ana Filipa Santos Ferreira, (2022). Acessibilidade Digital em Plataformas de Recomendação para a inclusão de Pessoas com Défice Intelectual e Desenvolvimental: fatores críticos e boas práticas para o desenvolvimento de uma Plataforma Web acessível. University of Aveiro.
- Virgínia Carvalho Chalegre (in progress). Proposta de Solução Digital para a Promoção da Empregabilidade de Pessoas com Deficiência. University of Aveiro and University of Porto.

Although the current output of this study is still a prototype, HiLives can be seen as a platform capable of functioning in a real context, meeting the needs of People with IDD, HEI and Companies. As such, this platform can undoubtedly contribute to positively modifying how inclusion is seen in academic and professional contexts. One of the reasons why the Hilives platform is so promising for this audience is because it recommends learning paths, as it can indicate to people which paths, they can follow to improve their qualifications and match the needs of companies.

The HiLives team believes that the intrinsic conceptual idea of the project can make an essential contribution to the future of digital platforms showing the potential of digital media to improve meetings between people with IDD, HE and companies.

GOOD PRACTICES FOR DIGITAL ACCESSIBILITY FOR PEOPLE WITH IDD

The study carried out allowed us to prepare a proposal of recommendations and good practices for the development of accessible digital solutions for IDD. The researchers carried out this collection through the note published by W3C, as well as through the data that was obtained during the evaluations. Thus, for digital solutions to be accessible for DID, it is recommended that:

Texts should be in simple, easy-to-read language.

Priority should be given to using small blocks of text. Where it is essential to present several pieces of information, it is recommended that these are divided into several blocks of text and highlight the main information.

Priority should be given to using images and icons to represent certain blocks of text. However, it is important to avoid appearing alone wherever possible.

The use of dropdown menus should be avoided; in other words, all information should appear without the need to click further to see what is on that menu.

A video should be created that exemplifies the use of the main functionalities of the digital solution, which can be viewed whenever necessary. In this way, the people with IDD can have an overview of the organisation of the platform and use it with less difficulty.

Users should be helped as for understanding the components and functionalities and how to use them. In other words, according to W3C (2021b), it is essential to use symbols, terms or standards that are already familiar to users, so that they do not have to learn new ones.

It should be ensured that platform operations do not need to be remembered. According to the W3C (2021b), memory barriers prevent users from using the platform.

Breadcrumbs should be used to remind users of the path they have taken.

Headings and descriptive texts should be used to identify the content users are viewing.

Users should be able to seek help and support. In other words, it should be made easy to get human help or, if there is a problem, to send feedback, as shown in the note published by the W3C (2021b).

There should be an accessibility widget so users can make basic settings and improve the platform.

Do not block adaptation and personalisation, as people with IDD may use extensions as assistive technology, as can be read in W3C (2021b). Thus, it is essential to support personalisation wherever possible as it is a way to support users.

The platform's content can be searched through a search bar, where topics should be suggested based on what the user writes, as suggested by W3C (2021b).

The navigation through the platform should be clear and well-structured.

The pages should present little information at a time (W3C, 2021b). This way, it is avoided that users are overloaded with information and have a better experience.

The use of mathematical concepts should be avoided. However, if they are necessary, W3C (2021b) recommends that there is a simplified textual option describing them.

The interface assists users in filling in forms by providing hints (W3C, 2021b)

The interface assists users in the event of an accidental touch. This can be achieved by allowing users to go back with a simple tap/click or from alerts in case that action deletes something from the platform (W3C, 2021b).

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ANNEXES

Annex 1 Questionnaire survey to collect requirements and state of the art/benchmarking

HiLives O2: Benchmarking and Suggestions for the prototype features

This form aims to comply with two tasks of Hilives Output 2:

- *State of the Art and Benchmarking of other digital tools*
- *Target Needs and Requirements Analysis*

I. Description of the Higher Education Institution

1) Name of the Higher Education Institution _____

2) Is your country divided by regions, states or other? (We need this information to understand if geographical criteria can be used to match opportunities). If so, which ones are they?

_____

II. Benchmarking of digital solutions

Do you know, in your country, any digital platform (or similar solutions) to connect and network opportunities between the expectations, skills and needs of people with IDD and both the Higher Education offer and the employment opportunities? Could you please, type the name and website (URL) of those tools? (If any are private platforms, please give us an access login).

_____

III. Suggestions for the prototype features

Please help us to define better the prototype features, according to your experience.

The general idea of this prototype is to connect People with IDD <-> HEs <->Companies.

Suggest features for each one of the main profiles:

1) Person with IDD profile_____
2) HEI profile (courses…)_____
3) Companies profile (job vacancies…)_____
4) What other features do you think the prototype should have (e.g., features common to all the profiles)? _____

Thank you very much! Your answers are very important for the development of this prototype.

Annex 2 Benchmarking of the platforms analysed

		Infojobs	Zaask	SEMEAR	Valor T	Coursera	Trailhead	IEFP online	Cidade das profissões	Tinder	Linkedin	Pais Em Rede	Carelogic	HiLives
Platform														
Aplication	Android	✓	✓	✗	✗	✓	✓	✗	✗	✓	✓	✗	✓	✗
	IOS	✓	✓	✗	✗	✓	✓	✗	✗	✓	✓	✗	✓	✗
Website		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Functionalities														
Correspondence between users		✓	✓	✗	!	✗	✗	✗	✗	✓	✗	✗	✗	✗
Creation of vacancies		✓	✓	✗	?	✗	✗	✓	✗	✗	✓	✗	✗	✓
Creation of courses		✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✓

Recommendation of learning paths	⚠	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✓
Recommendation of vacancies according to profile	✓	✓	✗	⚠	✗	✗	✗	✗	✗	✓	✗	✗	✓
System of notification system	✓	✓	✗	✗	✓	✓	✗	✗	✓	✓	✗	?	✗
Profile visualization	✓	✓	✗	✗	✗	✓	✗	✗	✓	✓	✗	?	✓
Publishing of experiences	✗	✗	✗	✗	⚠	✓	✗	✗	✗	✓	✗	✗	✓
Register/Login	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✗	?	✓
Translation options	✗	✓	✗	✗	✓	✓	✗	✗	✓	✓	✗	?	✓

Annex 3 Video transcript

Adapted video text (to narrate the video demo)

Hello, my name is Filipa, and I am a young girl with Intellectual and Developmental Disabilities (IDD). Today I am going to sign up on the HiLives website as I am looking for an opportunity to study in Higher Education and also to work.

As soon as I enter the HiLives website, I find a page where there are three types of registration; when I look at the page, I find more information about the website: its description and the aspects in which it can help me.

I start my registration by clicking on the card with the description "Person" and go to another page, which has various subjects.

When I finish writing the information about myself, I go to the login page, which is the entry to the site.

Before I start showing you the site, let me tell you that the links that will appear, both with the courses of the universities and with the vacancies of the companies, are made automatically. That is, there is a mechanism that reads the information that I wrote on the site during the registration, for example, the region that interests me and my preferred areas to study or work, etc; that mechanism makes a connection with courses and vacancies in companies that interest me the most.

So, if there is already a course or vacancy in a company that interests me a lot, when I start the session, it appears automatically.

There are two types of links between me and vacancies in companies. Some connections show that I already know a lot of what it takes to work in that vacancy. Other connections show me that I still need to learn a few more things.

On the HiLives website, I can search for opportunities to study and to work. After logging in, I go to a new page, which shows the last 4 links between me and university programmes, and also the

last 6 links between me and vacancies in companies. All of these have shortcuts that show more links and even more information about the course and the vacancy in the company.

Also on this page, there is a list of links that gives me access to a menu that is on the side and shows me the main pages of the site. I can also see messages that warn me about new links to vacancies in companies and to university programmes.

I can also see the personal menu, which lets me enter my profile, shows me my favourites, the settings, a help page, and also gives me the possibility to leave the site.

Below the list, I have a second menu, which follows me around the site, and presents the same options as the side menu.

As I said earlier, I am looking for an opportunity to study at university, so I will look at the links I have so far, and whether they are of interest to me.

By going to the page containing my university links, I can also see more information about the courses.

When I click on a course, I can immediately get an idea of what it's about.

Besides being able to see my links to courses, I can also see all the universities registered on the site and search for a course in them, if they interest me.

I want to look for a course at a university. But, if I change my mind and prefer to work, I can also see (on this site) vacancies in companies, and find out which ones I have connections with. It also lets me know if I already know a lot of what it takes to work in that vacancy, or if I still need to learn some things. So, in my connections, I can find out more about what the company is looking for and the job I'm applying for.

When I see information about a job vacancy that is interesting for me, and what I still need to learn in order to work there, there is also some information about what I can do if I am still interested.

When I go to the page with all the vacancies in companies, I can see other jobs that might interest me and that, by editing my profile, might appear in my links.

I can also see my links to courses and vacancies in companies on the same page. And get more information about them. I can also see, at the same time, all the courses and vacancies available

on the site. If I get interested in a link between me and a course or a vacancy in a company, I can save it in my favourites to look at later, if I want to.

When I log into my profile, I can: edit my personal information, see the courses I've already done, see my areas of interest (which I can also change if I want to). I can see what I already know and am able to do for studying and working, and also what working environments I prefer. If I scroll down a bit further, I can see if I've posted any video experiences and also post a new video. These experiences have to do with what I have experienced before, both in the work environment and in Higher Education or other schools.

Let me also show you that, in my profile, only the last 3 courses I have done appear, but here I can also see all the others I have already finished, and even add a new one. We can also enter these pages through the two types of menus on the site.

As well as being able to see what I have done, I can see what other people with IDD have done and how their experiences are going.

These real-life cases can help me make up my mind. These experiences have their own page and are all on video. The videos can tell me about experiences on a course or a job.

There is also an accessibility tool, which we can use to change something on the website to make it more accessible for everyone.

When we open the website, we can change the colours, underline the links, make the text bigger, and also the spacing between each letter and between each line, so that everything is easier to see and read. We can also make the letters easier to read, make the cursor bigger, and make any tool on the site accessible.

Finally, it is important to say that every page is accompanied by a footer that has some shortcuts, useful links, the HiLives project partners, and access to their social networks.

For all this to be possible, it is mandatory that Universities and Companies also register on the website. After their registration, they must insert all the information they have about their courses and job vacancies.

And that's all! As you have seen, this site can only work if everyone contributes, so I hope you use it like I do, following your goals and dreams!

Annex 4 HiLives Video Demo of Digital Prototype (IO2) Evaluation Protocol – People with IDD

Evaluation of the video demo for the digital prototype developed within HiLives Project (IO2), people with IDD (Intellectual and Developmental Disabilities).

Considering the need to validate the prototype according to the perception of its users with IDD, the following methodology is proposed:

- See the adapted text in the attachment and translate it into your native language so that people with IDD can understand the prototype without any problem.
- Choose five people with IDD to apply this methodology and recruit them. Please note that this evaluation must be face-to-face and it is necessary to introduce the project when recruiting.
- Create informed consent in accordance with the country's regulations.
- Create teams of at least two people, in which:
    - one of them will narrate the video (using and, at the end, will ask the questionnaire questions to the person with IDD;
    - the other person will be responsible for taking notes regarding the posture or what the person with IDD is saying and will also be responsible for filling in the questionnaire based on the answers given by the person with IDD.
- On the day of the evaluation the following steps must be followed:
    - Start the evaluation by introducing what the project is about (attached);
    - Give people the informed consent form and ask them to sign it to start the evaluation;
    - The video demo should be played without sound and one of the persons evaluating should read the text already adapted to the mother language;
    - After showing the video (accompanied by your narration) you should check if the person with IDD has any doubts about any term or feature and if it is necessary to explain it in another way. You can play the video again if necessary;
    - Finally, the survey questions present in the survey are posed; these should be spoken in the mother language.

This survey should proceed as follows:

- The person answers the questions orally and one of the interviewers fills in the survey;
- You must pay attention to whether the person understands all the terms that are being used;
- All questions must be answered, so one should push the person, setting an example if there is not so much cooperation.

Introduction for participants

"HiLives - Including and Connecting in Higher Education: networking opportunities for independent lives" aims to develop a prototype of a digital tool to connect and network opportunities, tackling gaps and mismatches between the expectations, skills and needs of young adults with IDD and both the Higher Education offer and the employment opportunities. Proposta de Solução Digital para a Promoção da Empregabilidade de Pessoas com Deficiência

With the data collected with this questionnaire, we want to continuously improve the development of the prototype. Your opinion is very important to improve this application.

In accordance with the General Regulation on Data Protection (RGPD) , the information collected is confidential and will be treated and kept anonymously, being destroyed at the end of the project. The results will only be disclosed in a scientific context, without ever revealing/disclosing their identity.

Annex 5 HiLives Video Demo of Digital Prototype (IO2) Evaluation Protocol – Companies and Higher Education Institutions

Evaluation of the video demo for the digital prototype developed within HiLives Project (IO2), according to the perception of Companies and Higher Education Institutions.

Considering the need to validate the prototype according to the perception of its users, the following methodology is proposed:

- Choose five Companies and five Higher Education Institutions to apply this methodology and recruit them. Please note that when recruiting it is important to introduce the project to the stakeholders and explain the evaluation flow.
- Create teams of at least two people, in which:
    - one of them will ask the questionnaire questions to the stakeholders;
    - the other person will be responsible for answering the questionnaire based on the answers given by the person with IDD.
- For this evaluation we suggest the following steps:
    - Ask them to watch the video asynchronously and set a day to complete the evaluation through a questionnaire. You should also send to the stakeholders the link to the video and respective access (in attachment);
    - On the day you go to answer the questionnaire you must start the evaluation by introducing what the project is about (attached);
    - Before starting the questionnaire, the person should be asked if they want to review the video. If the answer is affirmative, time should be given for This;
    - Read the informed consent present in the questionnaire and the person consents verbally. For this to be valid, it is important to record this part of the person consenting.
    - Finally, the survey questions present in the survey are posed; these should be spoken in the mother language. This survey should proceed as follows:
    - The person answers the questions orally and one of the interviewers fills in the survey;
    - You must pay attention to whether the person understands all the terms that are being used;

- All questions must be answered, so one should push the person, setting an example if there is not so much cooperation.

It should be taken into consideration that:

- These stakeholders do not need to be accompanied when viewing the video, which means that it can be watched in English and asynchronously.
- The evaluation does not need to be face-to-face, but can occur through the modality that suits you best, for example, through a video call by Zoom or a phone call.
- In order to facilitate the obtaining of consents, these stakeholders only give oral consent and it is noted in the survey;
- If you consider that another type of consent should be implemented, you should draft one according to the country's standards;
- The protocol to be followed with Companies and Higher Education Institutions is the same, however each one has its own survey.

Introduction for participants

One of the aims of the project "HiLives - Including and Connecting in Higher Education: networking opportunities for independent lives" is to develop a prototype of a website for sharing interests and finding linkages between opportunities to study and to work, accessible to people with IDD, in higher education and in the labour market.

Thus, this project includes the "development and validation of a prototype of an application to establish connections between the interests, needs and expectations of people with IDD, and opportunities to study in higher education and/or work in companies or agencies".

With the information we will ask you throughout this questionnaire, we want to continuously improve the development of the prototype. Your opinion is very important to improve this application.

In accordance with the General Regulation on Data Protection (RGPD) 2016/679, the information collected is confidential and will be treated and kept anonymously, being destroyed at the end of the project. The results will only be disclosed in a scientific context, without ever revealing/disclosing their identity.

Link to the video demo

Video link: [video link]

Access key: [access key]

Note: The video should not be disseminated with others outside the project, as what is present can still undergo major changes.

Note 2: If the website is in a language other than your own enter the access key so you can then change the language in the top bar (as can be seen by the following images).

Annex 6 Questionnaire applied to partners after the video demonstration evaluation (partners)

HiLives Demo Evaluation

This brief questionnaire aims to collect data to integrate the process and continuous improvement of the IO2 prototype development. Your opinion is extremely important to improve this digital solution.

I. Usability Questions

1) Use the scale from 1 to 5, where 1 corresponds to 'totally disagree' and 5 corresponds to 'totally agree' to rate the following items:

1.1) There is a coherent navigation layout on the different pages of the prototype.

1.2) I found the system unnecessarily complex.

1.3) I found the various functions in this system were well integrated.

1.4) I thought there was too much inconsistency in this system.

1.5) I think the information displayed is adjusted to the users of this platform.

II. Content, Accessibility and General Concepts

2) Below are some open questions about the content, accessibility and general concepts of the prototype.

2.1) What do you think about the idea developed here? _____

2.2) Do you think this prototype has an Easy-to-Read language? _____

2.3) If you could change anything about the displayed information, what would it be? _____

2.4) Would you change anything to be more user friendly for people with IDD? _____

2.5) Do you have any suggestions for improving the accessibility of the pages? If so, which ones?

_____

2.6) Would you change anything about the scope of this platform? _____

Thank you very much! Your answers are very important for the development of this prototype.

Annex 7 Questionnaire for video evaluation demonstration for people with IDD

Prototype demo evaluation for persons with IDD

I. General Information

1) Country (Choose one of the following answers):

a. Belgium

b. Spain

c. Iceland

d. Portugal

II. Usability and Features

2) Below are some items about the features of the prototype. Use the scale from 1 to 5, where 1 corresponds to totally disagree and 5 corresponds to totally agree, to rate each item.

2.1) I would like to use this site often.

2.2) This site is very complicated.

2.3) I need help from a technician to use this site.

2.4) It was easy to understand the messages on this site, and what they showed.

2.5) Almost everyone will learn how to use this site.

III. Content and General concepts

3) Would you like to change anything about the website to make it:

3.1) The most enjoyable - if so, what? _____

3.2) The most user-friendly - if yes, what? _____

3.3) The most useful for everyone - if yes, what? _____

IV. Personal Opinion

4) If you could change anything about the site, what would it be? Images, text, colors, page background colors, links, other things.. _____

5) Do you have any other ideas on how to improve the site? _____

Thank you very much! Your answers are very important for the development of this prototype.

Annex 8 Questionnaire for video evaluation demonstration for Companies

Prototype demo evaluation for Companies

The European Project HiLives - Including and Connecting in Higher Education: networking opportunities for independent lives is a Erasmus+ project with 8 partners (universities and associations that working with young adults with and their families from four countries: Spain, Iceland and Portugal, Belgium). It aims to deepen knowledge and share practices in the inclusion of students with IDD in HE, and in their transition to an active and independent life, exploring the role digital media can play this process. The main result will be the development of strategies and tools to support the personal, academic and socio-professional development of young adults with IDD within the HE and employment context. This brief questionnaire aims to collect data to integrate the process and continuous improvement of this prototype development. Your opinion as a representative of a company is extremely important to improve this digital solution. Thank you very much for your collaboration.

I. General Information

Please indicate some information about your Company:

1) Country (Choose one of the following answers):

a. Belgium

b. Spain

c. Iceland

d. Portugal

2) Number of employees: _____

3) Type of activity (e.g. catering; printing industry ...): _____

II. Usability and Features

2) Below are some items about the features of the prototype. Use the scale from 1 to 5, where 1 corresponds to totally disagree and 5 corresponds to totally agree, to rate each item.

2.1) There is a coherent navigation layout on the different pages of the prototype.

2.2) I found the system unnecessarily complex.

2.3) I found the various functions in this system were well integrated.

2.4) I thought there was too much inconsistency in this system.

2.5) I think the information displayed is adjusted to the company users of this platform.

III. Content and General concepts

Below are some items about the content and general concepts of the prototype.

3) Have you had any experience in hiring people with IDD?

a. Never

b. I have already hired one / few people with disabilities

c. I've hired many people with disabilities.

4) Use the scale from 1 to 5, where 1 corresponds to totally disagree and 5 corresponds to totally agree, to rate each item.

4.1) I think that the developed idea is relevant.

4.2) I believe this platform will not help the process of including people with IDD in the job market.

4.3) From my experience, I think most employers will be interested in joining this platform

5) If you could change anything about the displayed information, what would it be? _____

6) Would like to leave us any other comment or suggestion? _____

Thank you very much! Your answers are very important for the development of this prototype.

Annex 9 Questionnaire for the matrix evaluation of partners

Below are some items about the features of the prototype. Use the scale from 1 to 5, where 1 corresponds to totally disagree and 5 corresponds to totally agree, to rate each item.

1) The HiLives Platform is easy to use.

2) I feel comfortable to insert my data on the website.

3) I feel confident to finish my tasks on the HiLives Platform.

4) I will likely return to the platform in the future.

5) I find the platform to be attractive.

6) The platform has a clean and simple presentation.

7) I would recommend this platform to a friend or colleague.

8) Since the algorithm will consider the country division for the recommendations, please indicate how your country is divided and what the divisions are. For example, if it is divided into regions, districts, autonomous regions, etc. In the case of Portugal, we have opted for the Division into districts, as it is the one which divides the country into different areas, and which is not too extensive for young people as another division would be.

9) Do you have any other suggestions you would like to add? (Regarding to any specificities of your country).

This spreadsheet contains some requirements of the digital platform, corresponding to HiLives IO2.
Below are some instructions for consulting and filling out this file:

1. The tabs are separated by user profile

2. Gray cells are for consultation only. We ask each partner to answer the questions, filling only the blank cells of the tabs:
- Person
- HE
- Company
- General

3. On the last tab there are some suggestions already received and compiled in the last survey. Please notice that these suggestions have not yet been included in this version of the Demo.

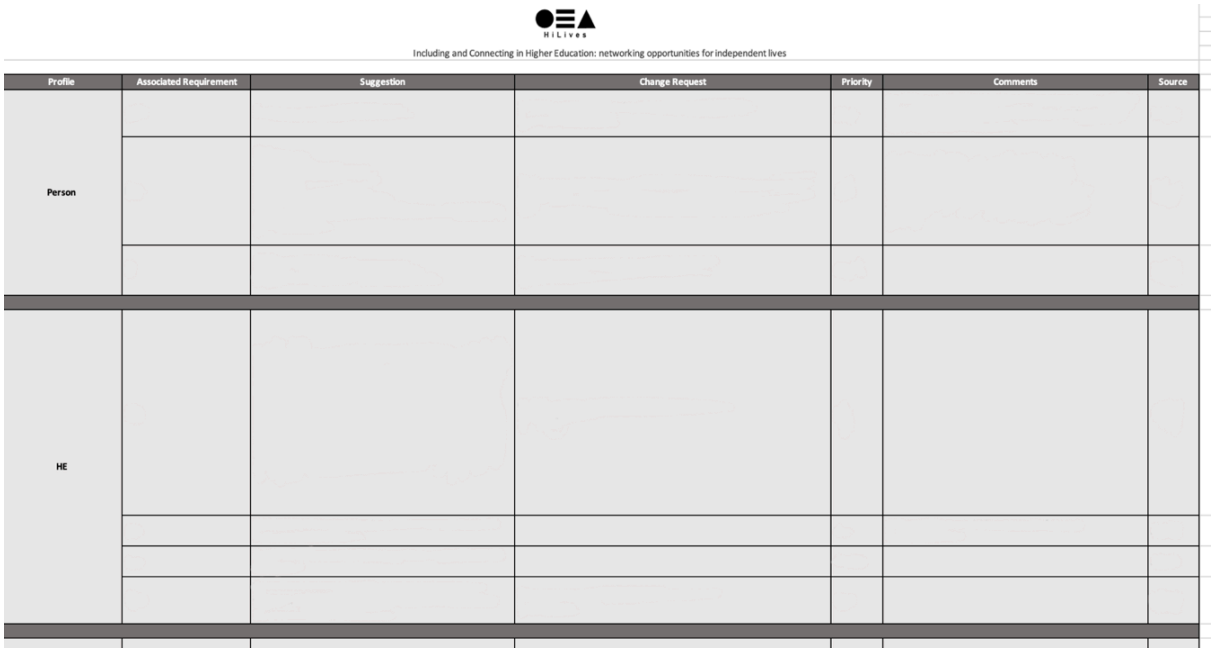
Figure 13 Organization of the requirements Excel


HiLives

Including and Connecting in Higher Education: networking opportunities for independent lives

Requirement/ Feature	Description	Data Entry	Aditional Information	Done	Do you consider this feature useful for the target audience?	Do you have additional comments?

Figure 14 Organisation of the tabs with the requirements for IDD, HEIs, companies and general requirements


Including and Connecting in Higher Education: networking opportunities for independent lives

Profile	Associated Requirement	Suggestion	Change Request	Priority	Comments	Source
Person						
HE						

Figure 15 Organization of the tab with the requirements suggested by the partners

Annex 10 The main pages of the developed prototype

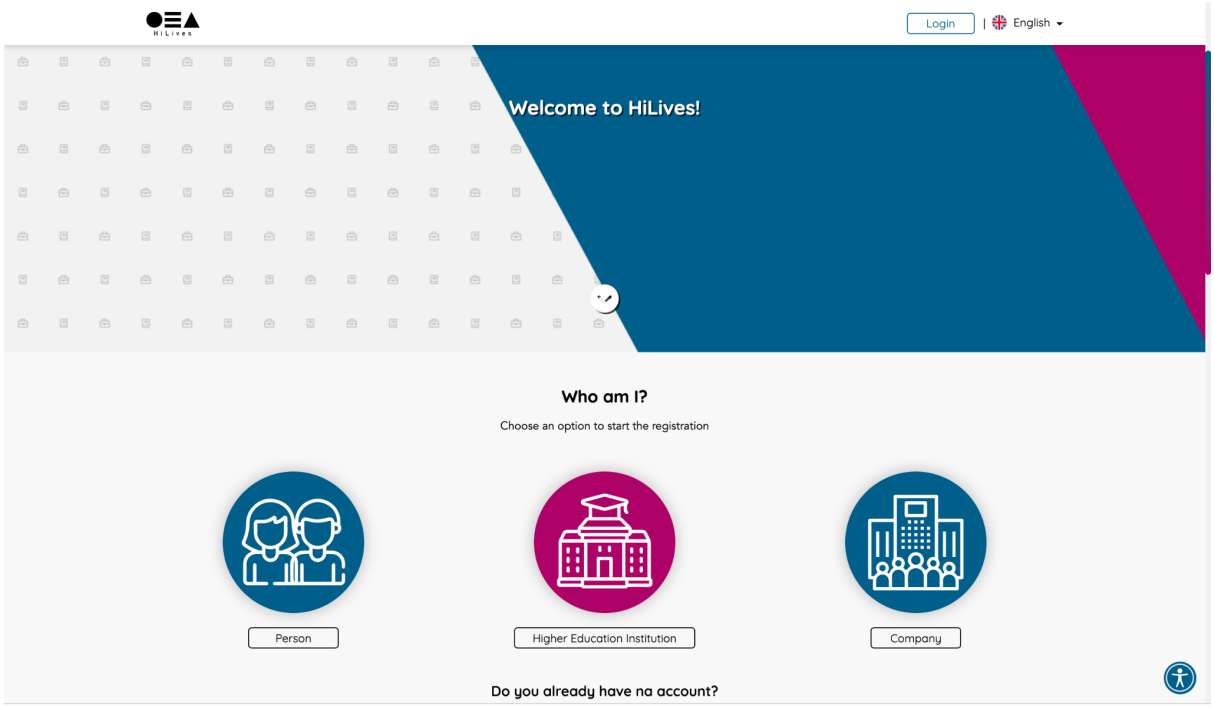


Figure 16 Home Page

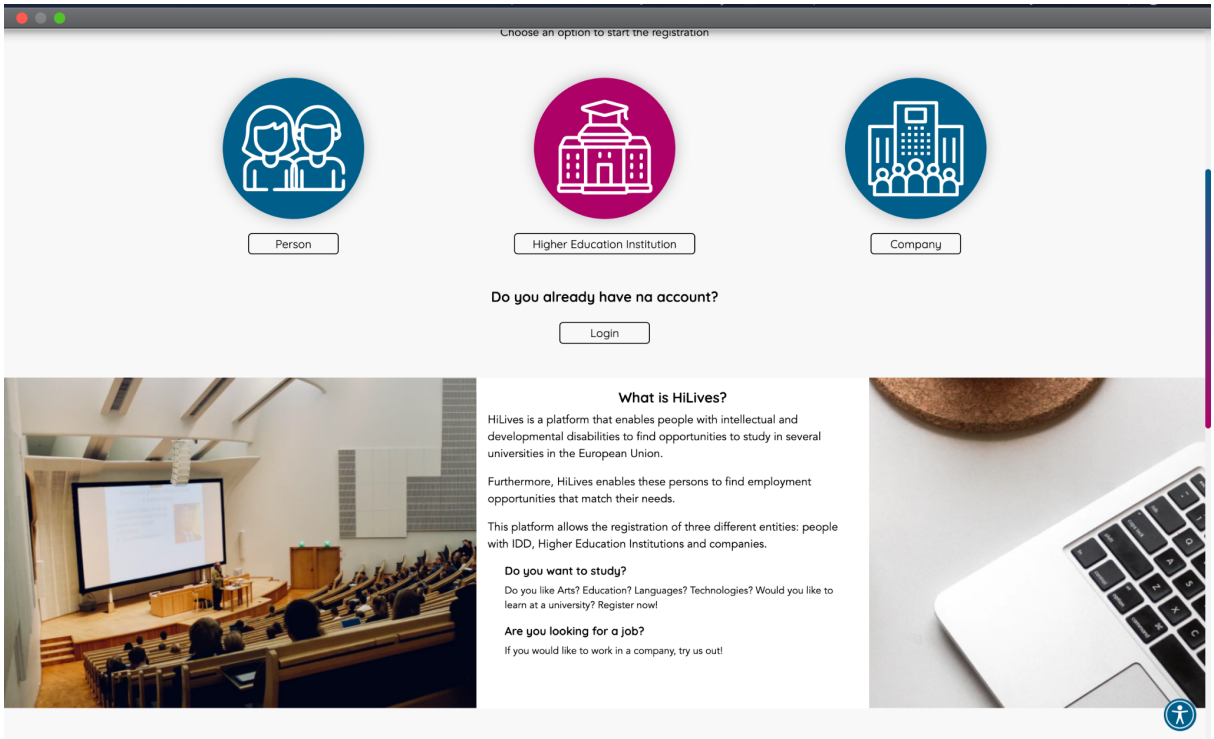


Figure 17 Information about the Hilives Project

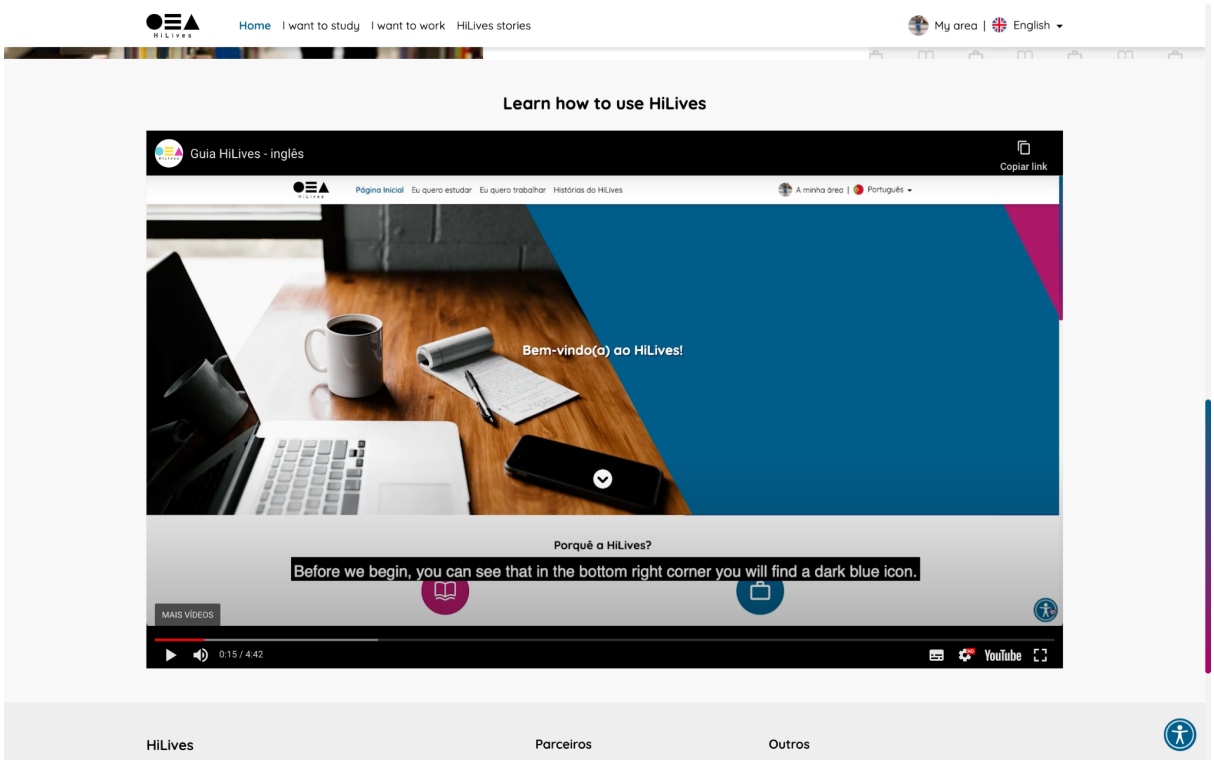


Figure 18 Explanatory video on the Platform

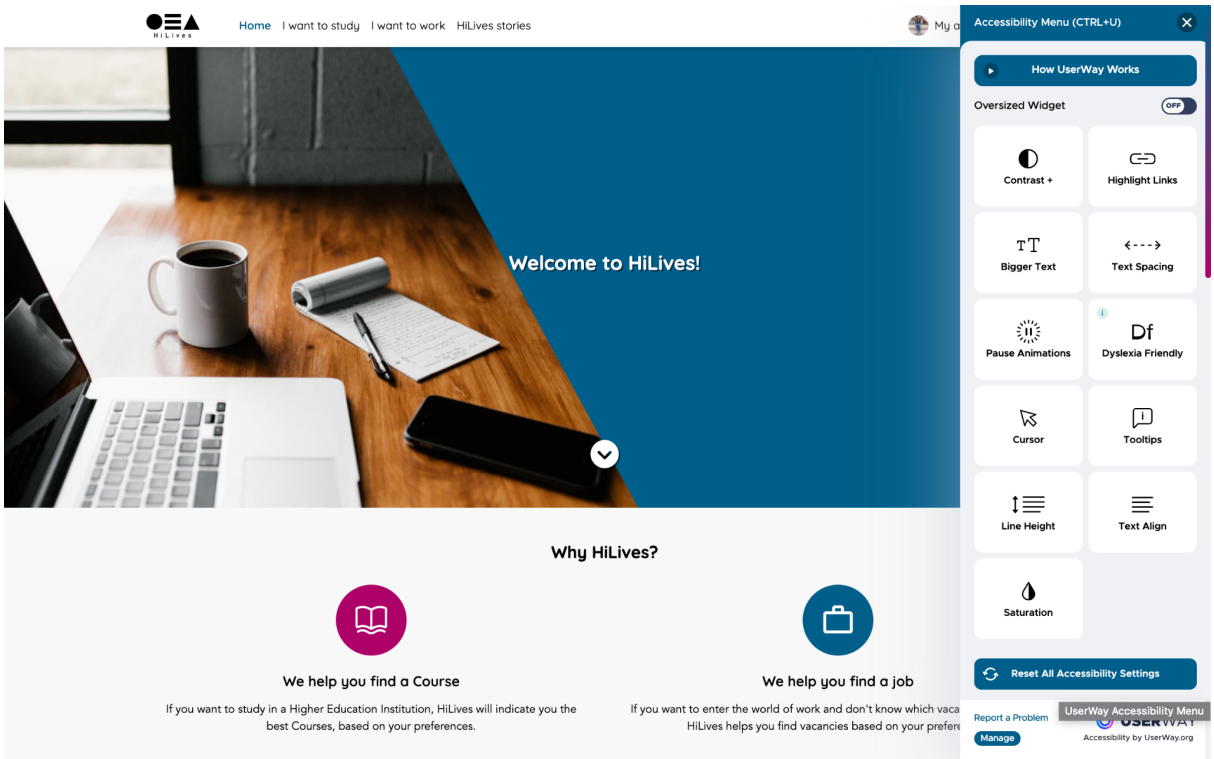


Figure 19 Accessibility Menu

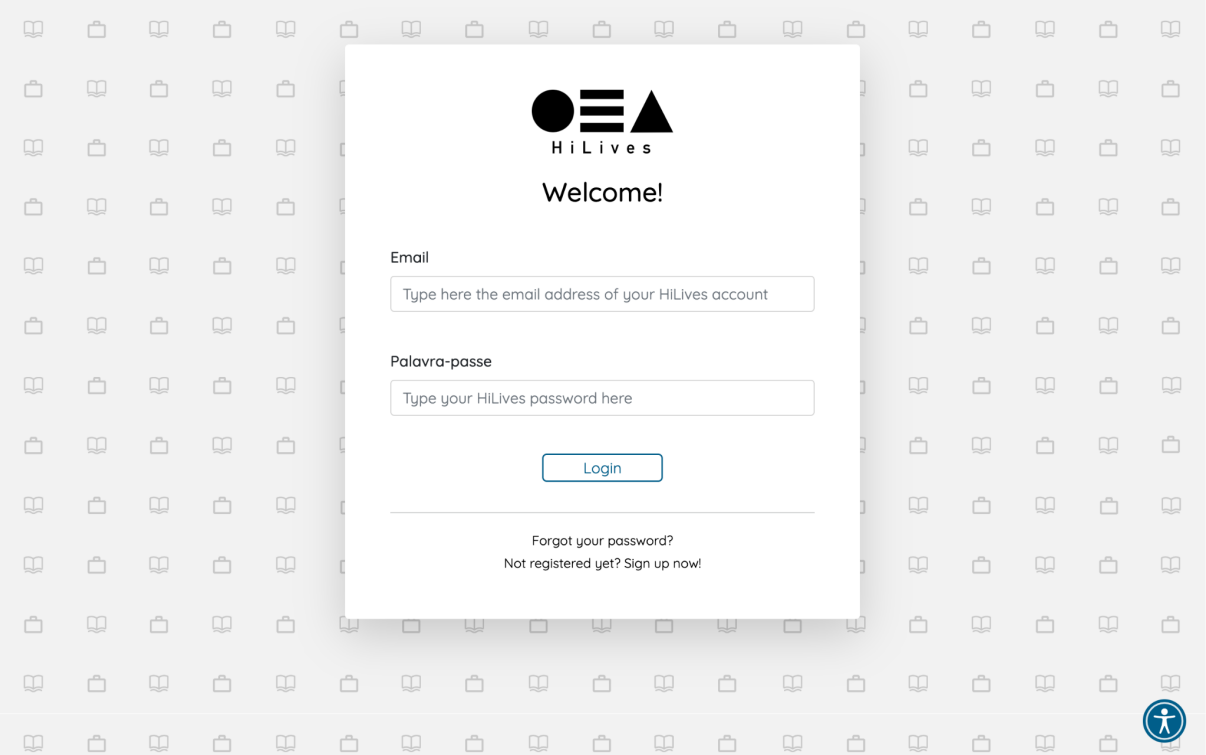


Figure 20 Login Screen

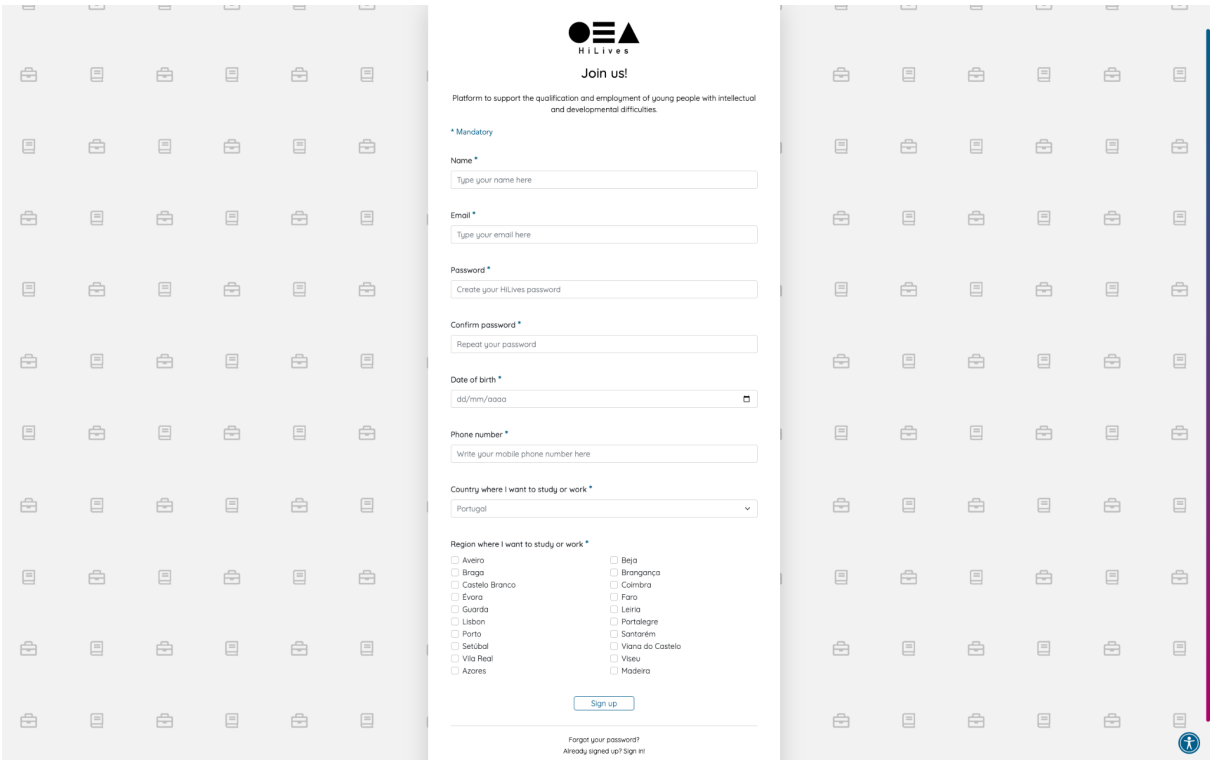


Figure 21 Page - Registration of the Person

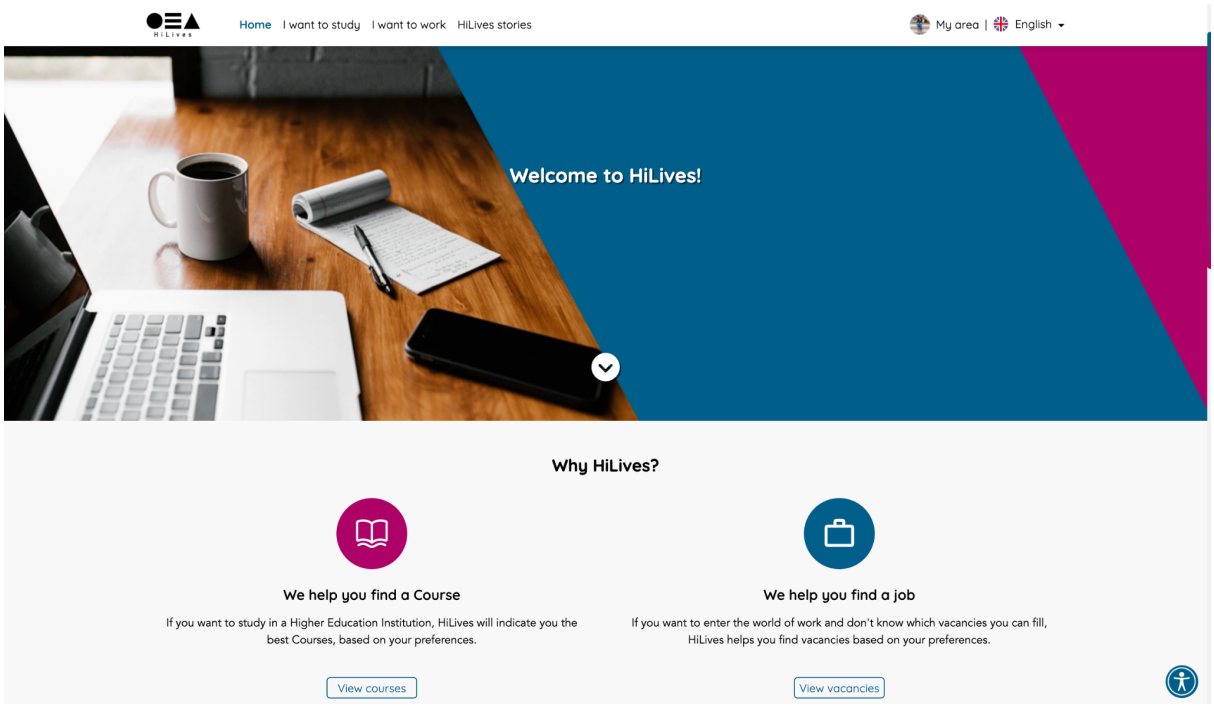


Figure 22 Homepage - Person with IDD

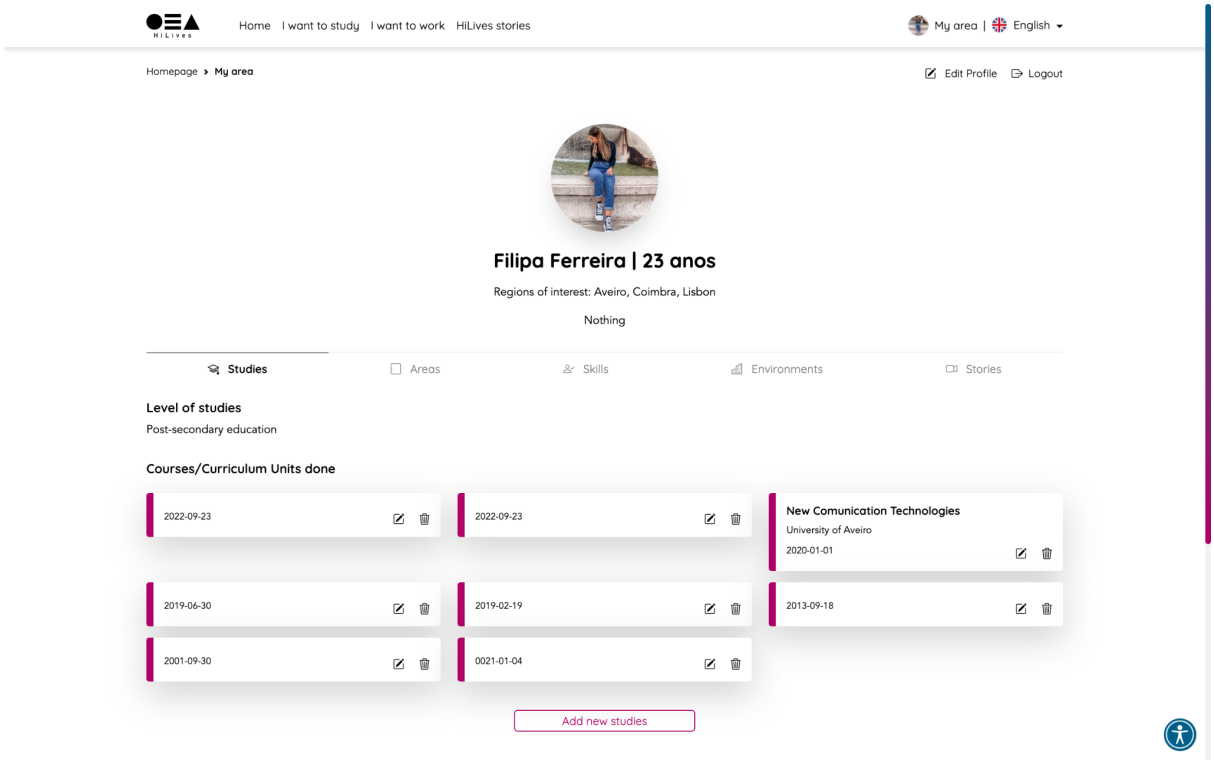


Figure 23 User Area- Courses/Curriculum

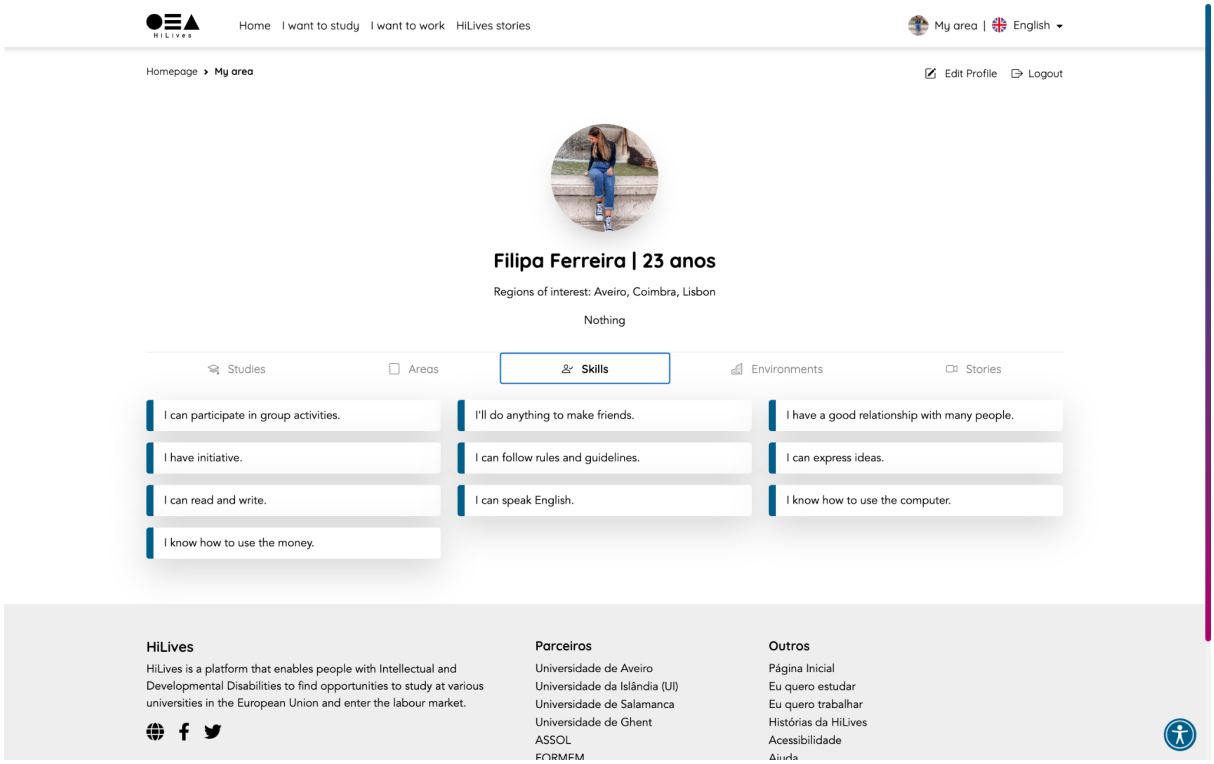


Figure 24 User Area- Skills

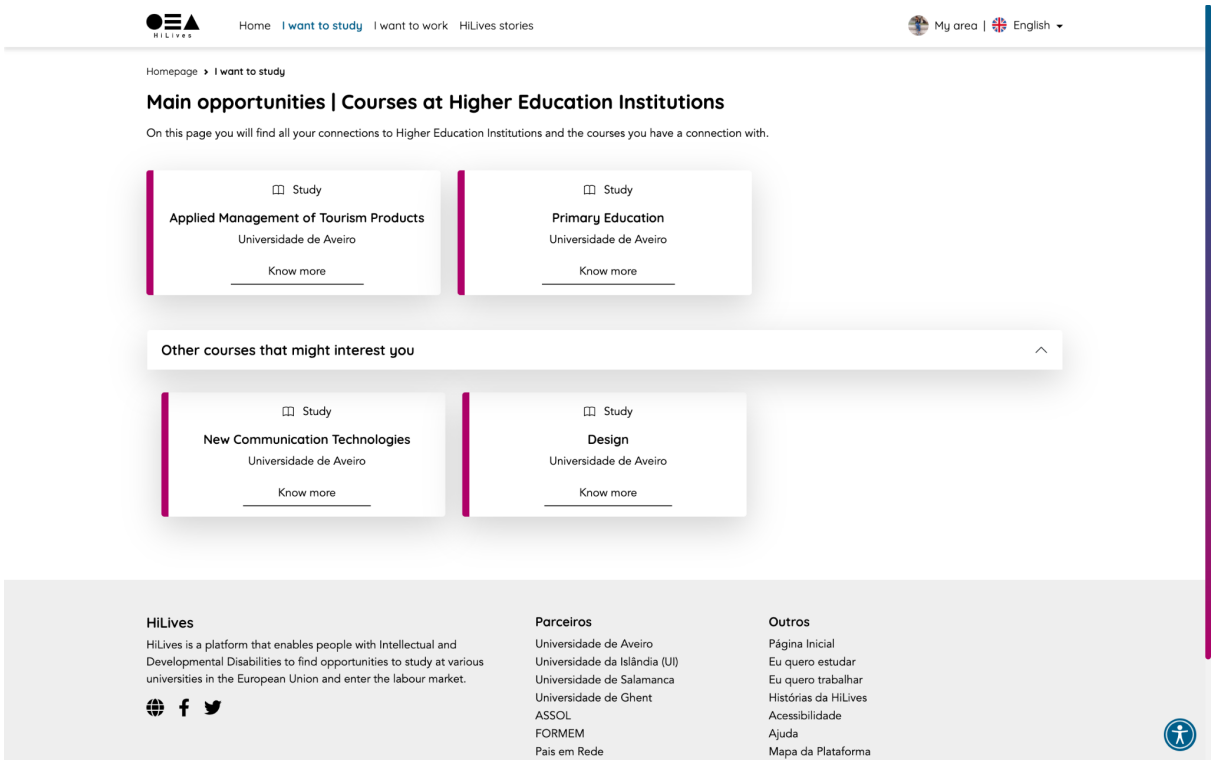


Figure 25 Page - I Want to study

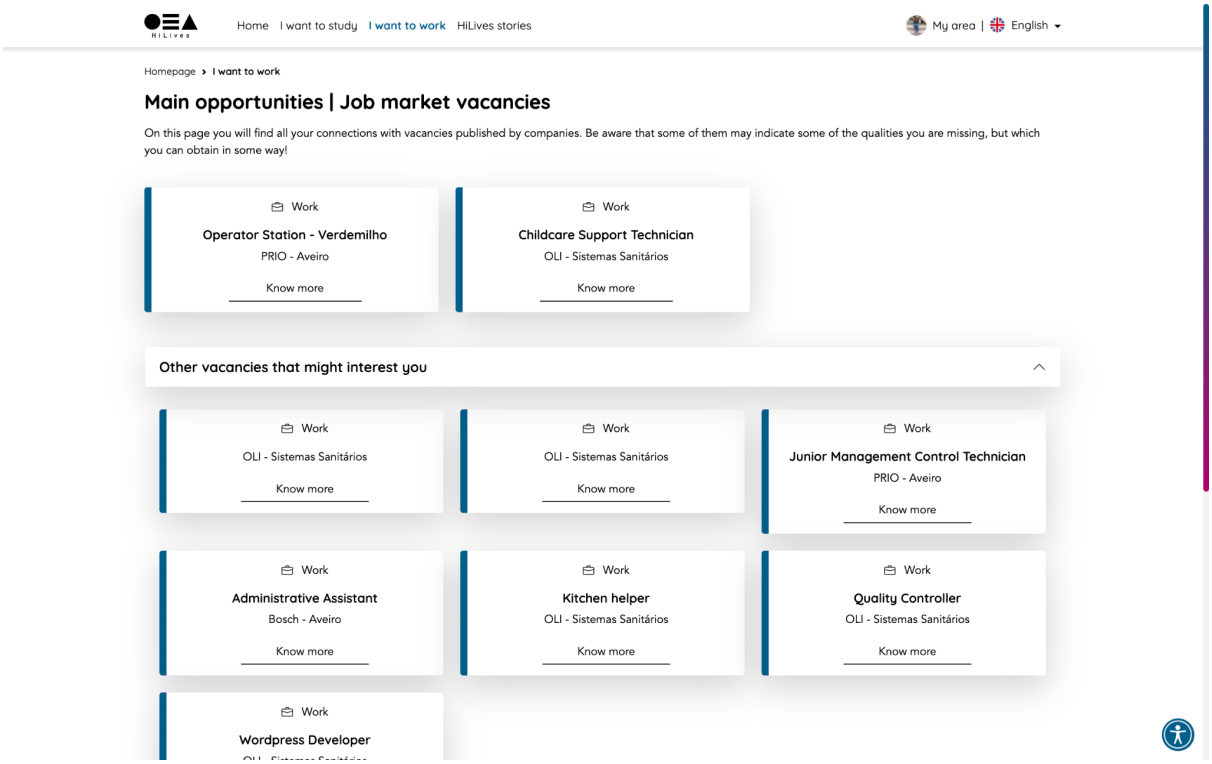


Figure 26 Page - I Want to work

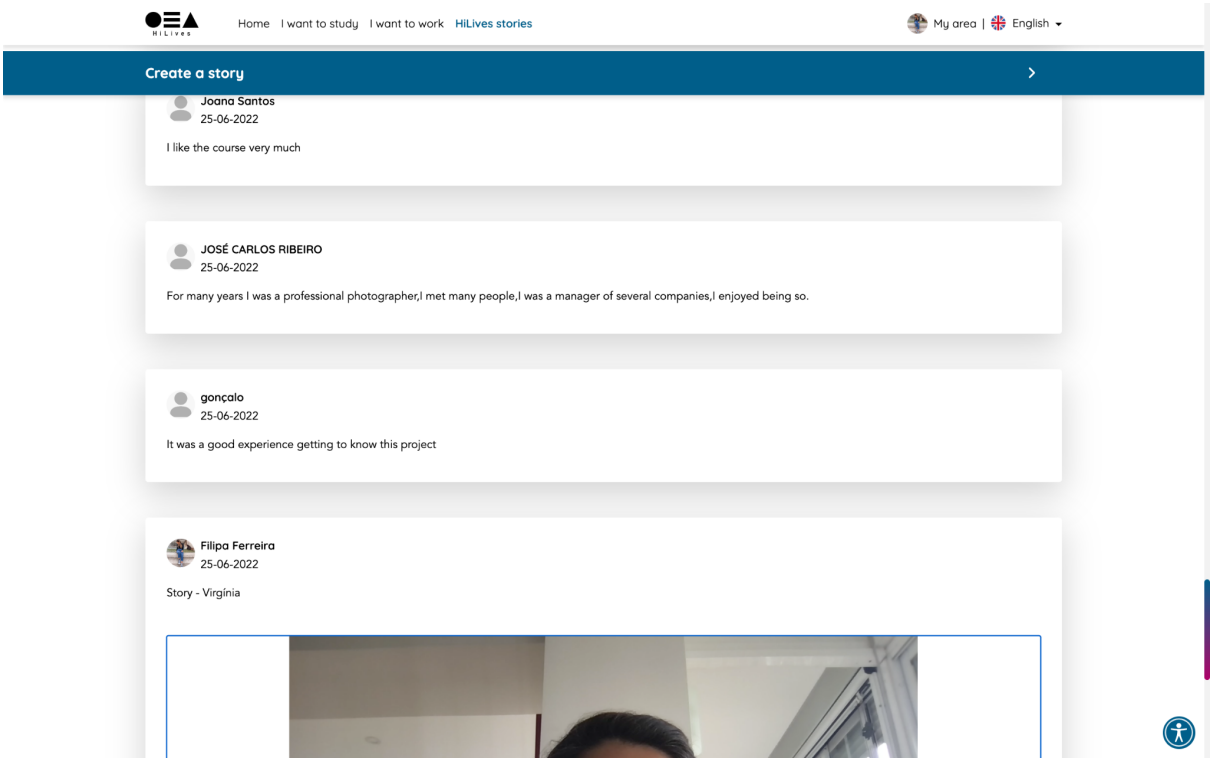


Figure 27 Page - Hilives stories

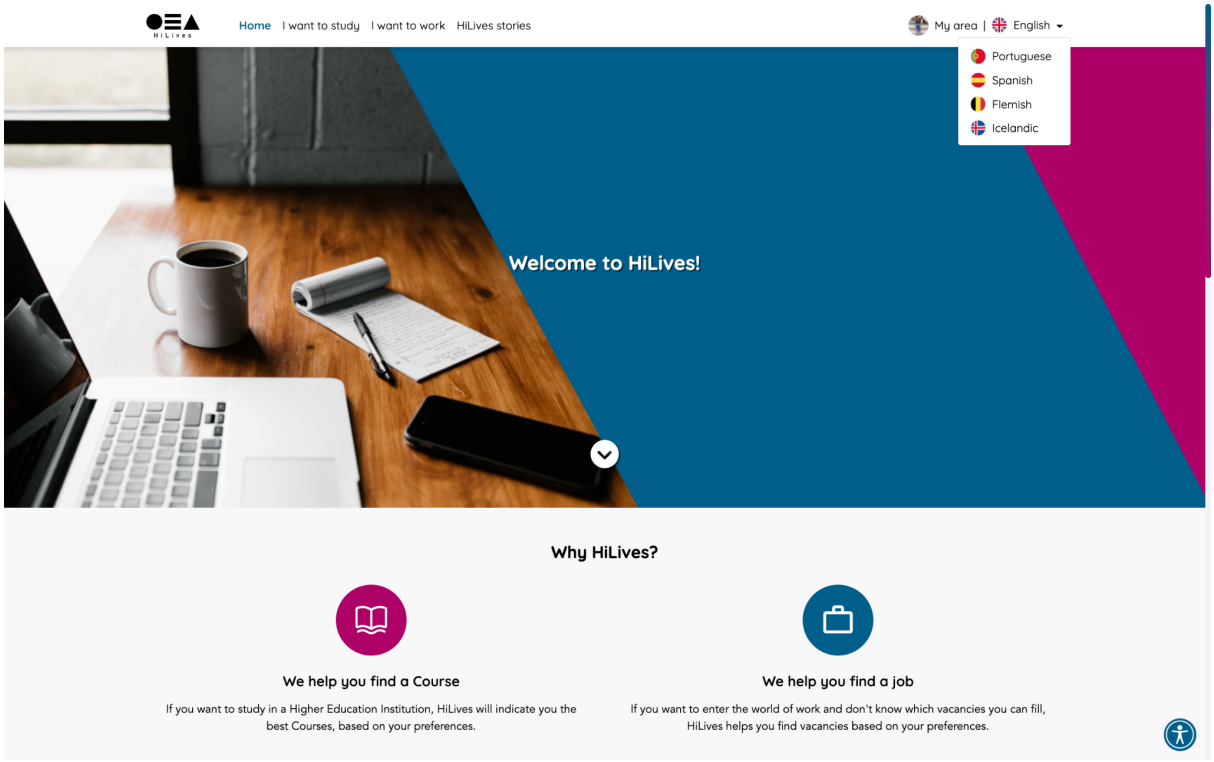


Figure 28 Language selection

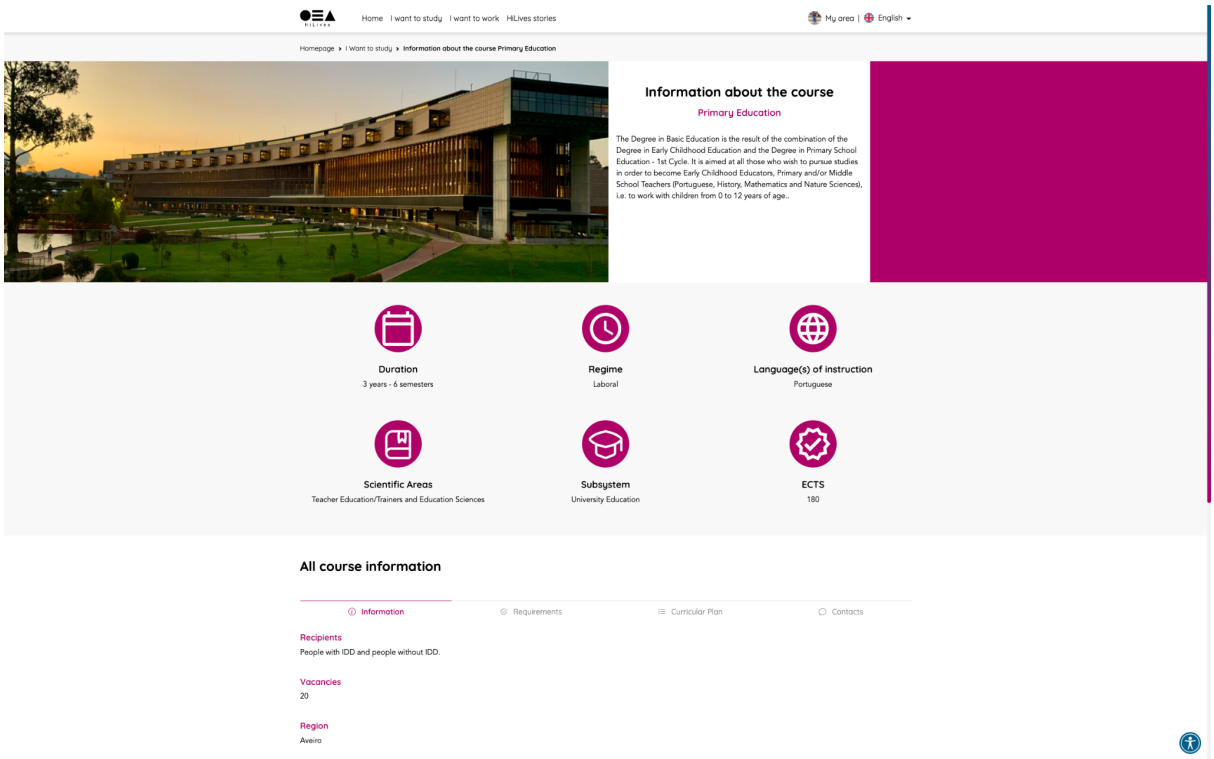


Figure 29 General Information about the selected course

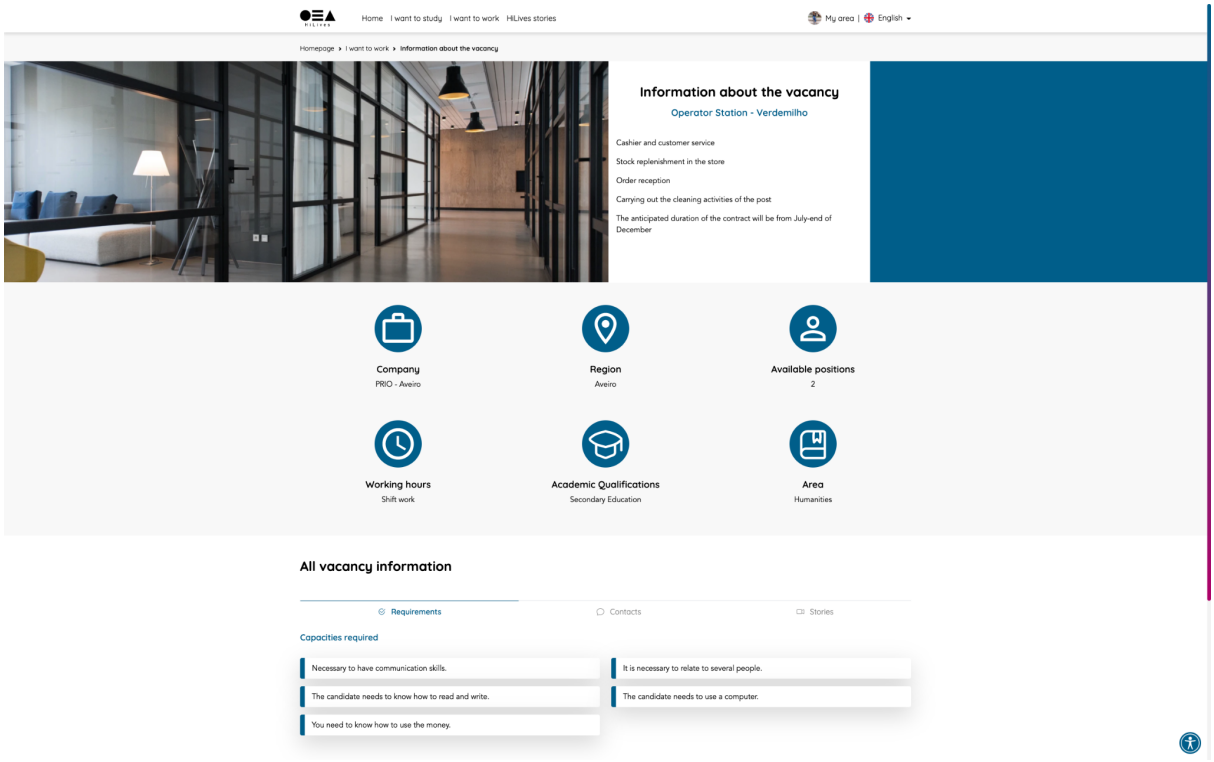


Figure 30 General Information about the Selected Vacancy

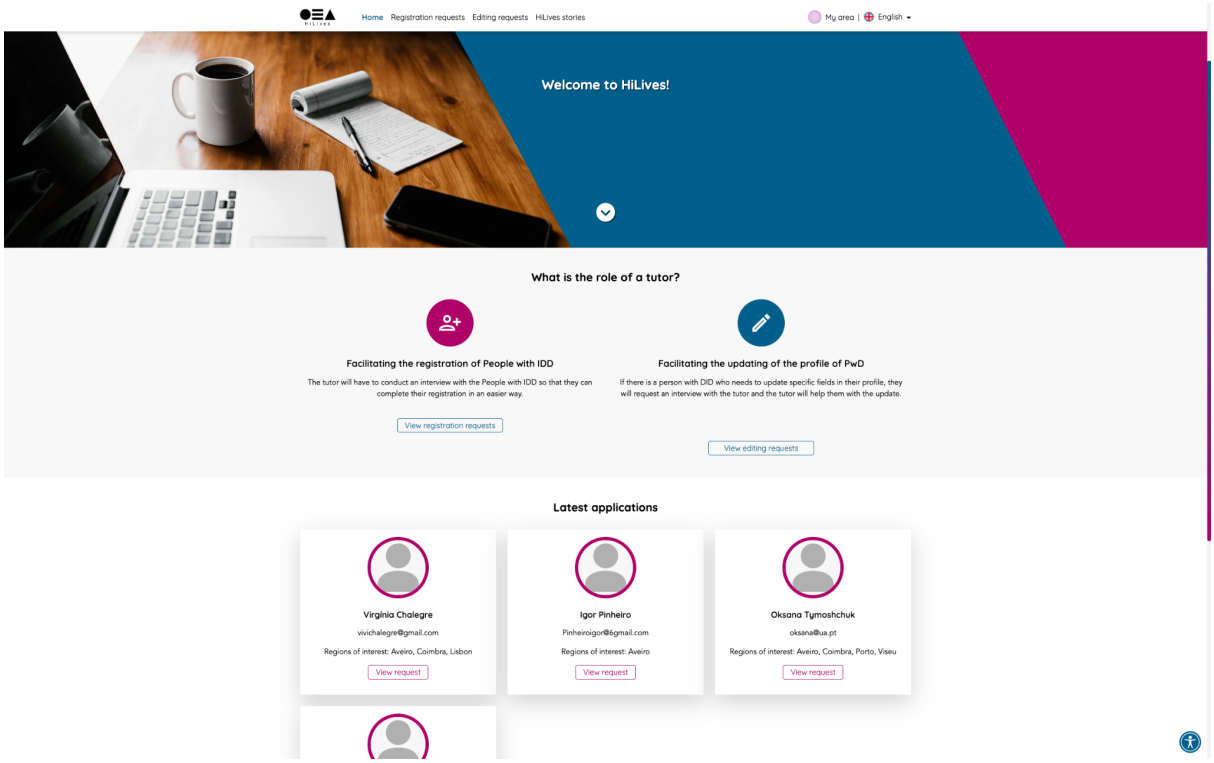


Figure 31 Homepage - Tutor

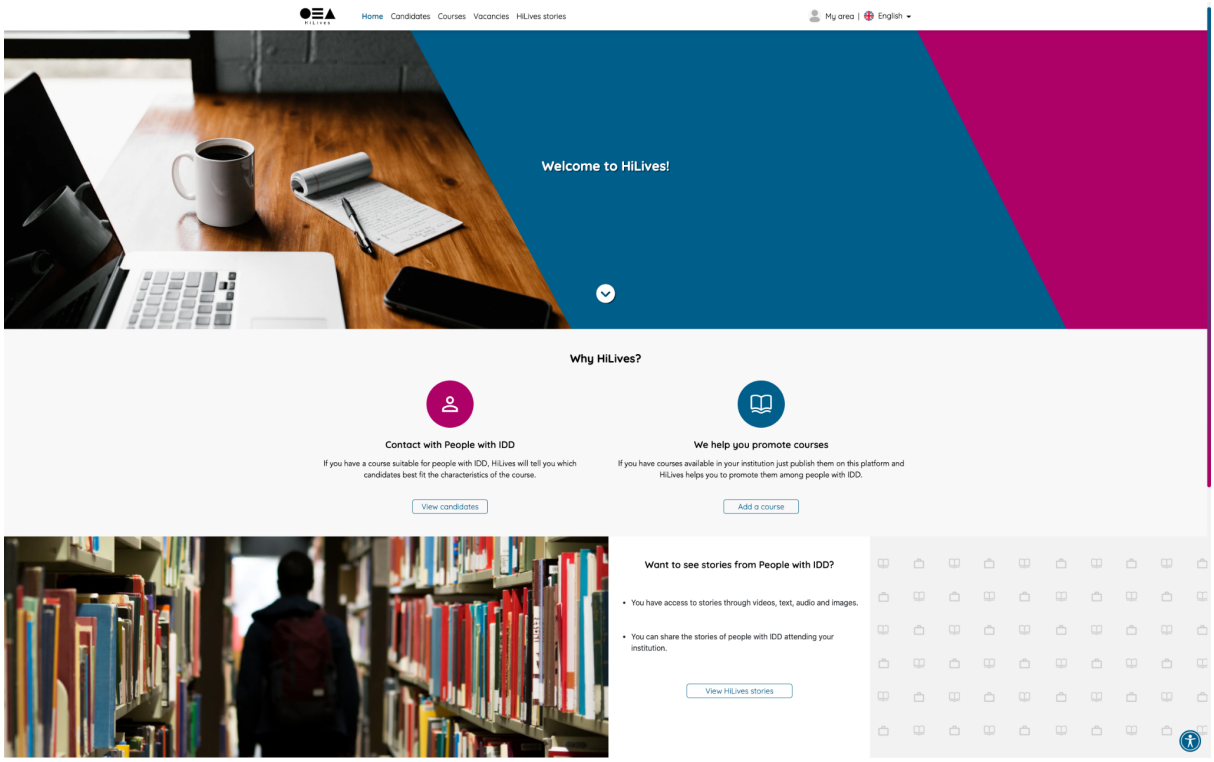


Figure 32 Homepage - Higher Education Institutions

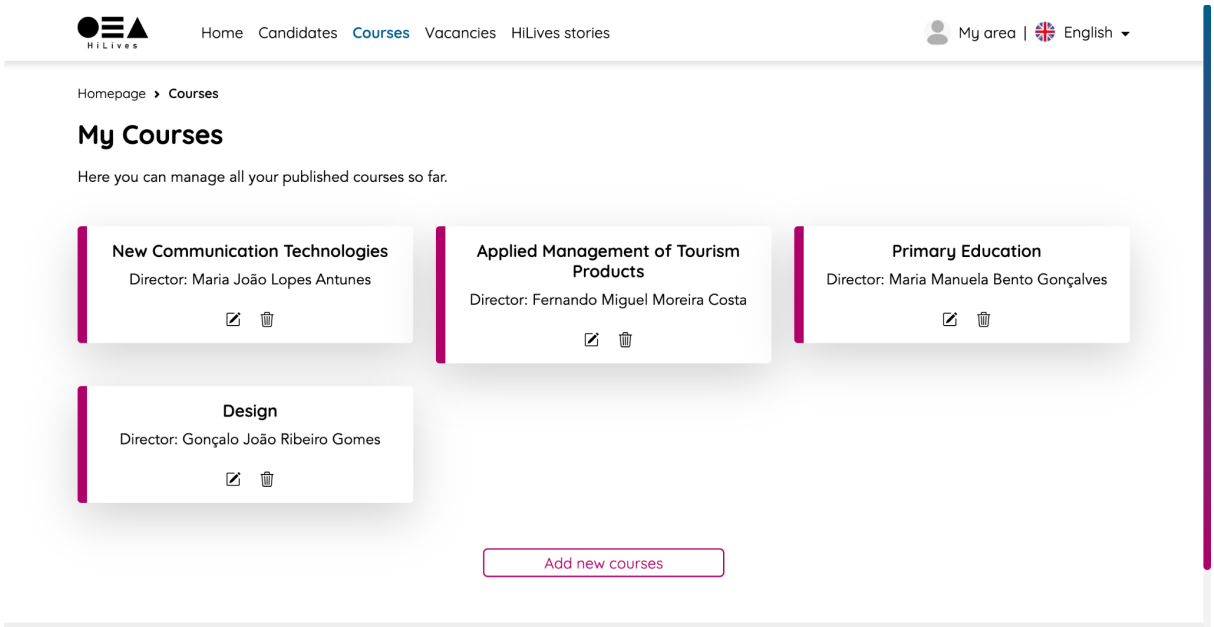


Figure 33 Page - Courses

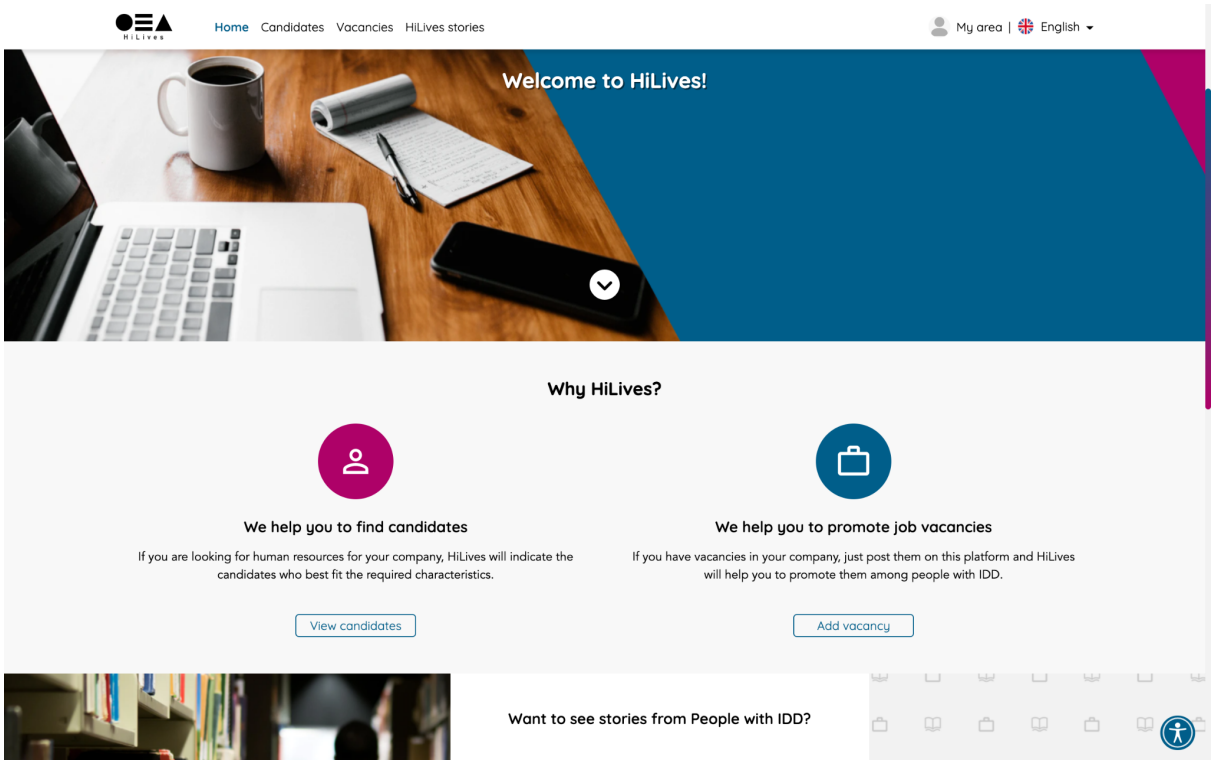


Figure 34 Homepage - Company

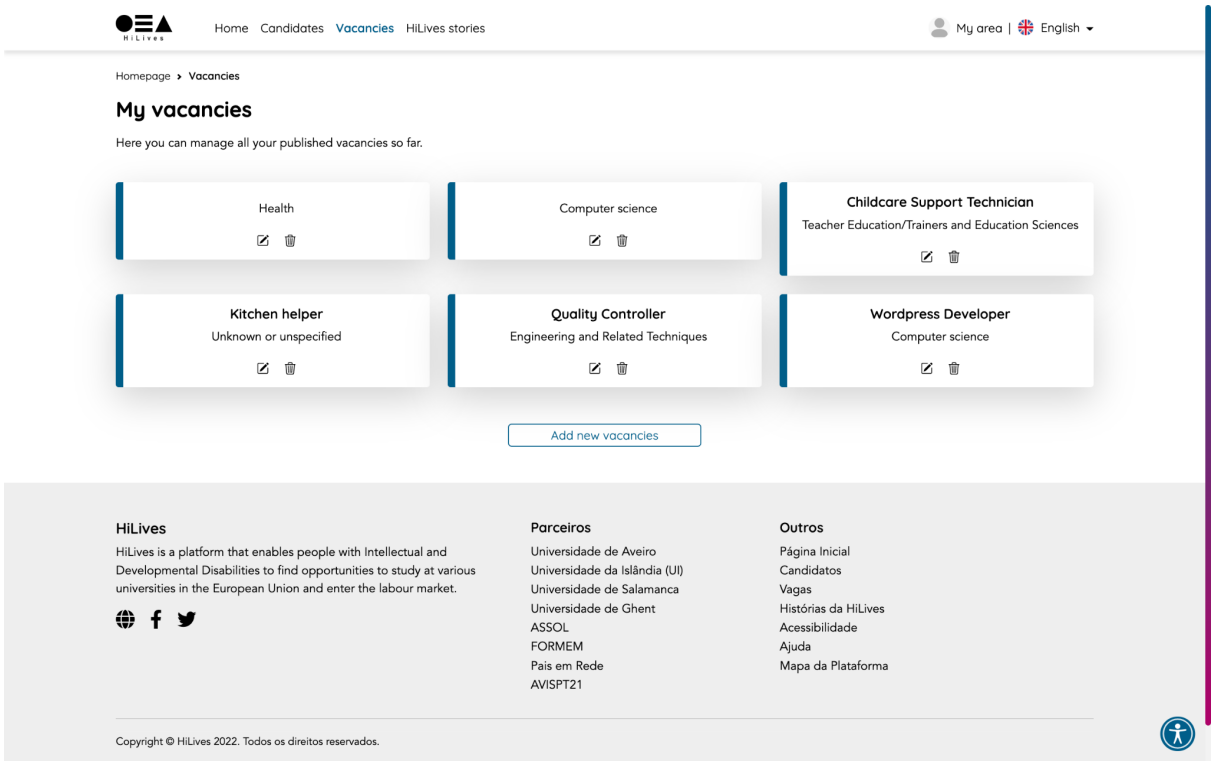


Figure 35 Page - My vacancies