

## Competency-based education advances in Higher Education in Health

**Pau Martínez-Bueso, Olga Velasco-Roldán, Iosune Salinas-Bueno, Inmaculada Riquelme-Agulló, Elisa Bosch-Donate**

Departament Infermeria i Fisioteràpia, Universitat Balearic Islands, Spain.

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### **Abstract**

*INTRODUCTION. The incorporation of digital technology to rehabilitation settings requires competency-based education advances in Higher Education in Health or in life-long training. AIM. This work aimed at developing knowledge in digital rehabilitation, exploring competences in Digital Rehabilitation in higher education teachers, students, and professionals, and creating pedagogical tools for them. A consortium of higher education teachers from 5 European countries (DIRENE consortium) designed and piloted a project in higher education studies from health and social care. METHODS. This was a multicentre study that was performed through mixed methodology. RESULTS. Digital competences in students, teachers, and professionals were found. Digital content was created: a handbook and a module on digital rehabilitation study. CONCLUSION. Assessing Competency-based education advances in Higher Education in Health is an essential need for the design and development of educational methods and for enhancing the use of digital technologies in the rehabilitation practice.*

**Keywords:** *Digital rehabilitation; competences; higher education; teachers; students; internationalization.*

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## **1. Introduction**

Global need for rehabilitation is increasing due to population aging and increases in chronic health conditions, among other causes (WHO, 2022). The World Health Organization estimates that by 2050 over 2 billion people globally will need one or more assistive device at some point in their lives (WHO, 2021). Therefore, the need for cost-effective services and solutions for rehabilitation is evident. Digital transformation provides many opportunities, however many rehabilitation service providers and healthcare professionals in Europe and elsewhere, struggle using the new digital opportunities (Brunner et al, 2018). The rehabilitation sector was strongly hit by the COVID-19 pandemic (Heiskanen et al, 2021). Part of the challenges faced by the rehabilitation sector include the lack of technical knowledge, capacities, and didactical competencies in the application of digital rehabilitation (Longhini et al, 2022; Mikkonen et al, 2018). One of the main identified challenges in the adaption of new digital opportunities, was the access to relevant and evidence-based knowledge of which solutions to use to include digital rehabilitation into the scope of services provided (Davies et al, 2022; Redecker et al, 2017). Another identified challenge was the general competence and capability of rehabilitation workforce to design use cases, with the users, for the existing digital solutions and for the different emerging technologies (Jarva et al, 2022; Seeman et al, 2023).

Transnational cooperation in higher education offers an opportunity to create innovative teaching and learning experiences, developing competences on scale to ensure access to diverse digital knowledge in rehabilitation (Nezaha et al, 2020). That is the reason why we created and finished the project, “Competences for the new era of user-driven digital rehabilitation” (DIRENE): it addressed the emerging challenges brought by Covid-19 and the need for the development of digital rehabilitation (DR) through higher education, according to competence and practice to build the resilience of future rehabilitation systems.

## **2. Aims of the work**

The overall objective of this project was to contribute towards the resilience of rehabilitation systems through the development of DR competences of teachers, students and working life professionals. The specific objectives of the project included: 1) developing knowledge in DR for teachers, students, and professionals for competence development in DR and, 2) increasing learning opportunities in DR through theory and evidence-based practice.

These objectives were achieved through active global cooperation and international networking between universities from Finland, Spain, Austria, Germany, and Greece.

Different stakeholders were widely invited to contribute to the development work, including partners outside Europe, who offered new expertise and reverse learning opportunities.

### **3. Methods**

This was a multicenter European study that was applied across different DR disciplines. To proportionate a multilevel perspective, a previous scoping review was done, and two different studies were performed.

Firstly, a quantitative study was done to create a pilot questionnaire on competences for DR. After the feedback, the questionnaire was refined and improved in writing and comprehension. Definitive questionnaire was utterly completed by rehabilitation educators, students, and professionals of the 5 countries.

Secondly, a qualitative, explorative, transversal research design was conducted. This methodology was specifically used to have a basic descriptive qualitative approach about learning needs related to DR, and barriers and facilitators to DR education. To do so, different focus groups were conducted from different roles (healthcare professionals, health sciences teachers and students)

### **4. Results**

These objectives were achieved through developed Discussion papers, Framework, open pedagogical Handbook and a study Module with open on-line learning materials for the use of identified target groups in Europe and beyond.

The applied and empirical findings of interest to higher education professionals, students, and professionals for competence development in digital rehabilitation were:

- a. From the scoping review:
  - Information collected on digital technologies for rehabilitation: data are in press
- b. From the analysis through mixed methodology:
  - Digital competence and training needs analysed through mixed methodology: quantitative and qualitative research (see table 1 and 2)
  - Sources of information developed: Open pedagogical Handbook for teachers, trainers and the working life addressing the creation of on-line/virtual learning material on DR based on mobile technologies, considering the variety of learners needs in global contexts, considering clients, students and the current and future working life professionals (“Handbook Mobile Education & Training of Digital Rehabilitation Competencies”)
  - An e-learning module on DR study module (10 ECTS cr) and open mobile learning course (2 ECTS cr) on DR developed and implemented that is accessible across the target groups and countries (“Introducción a la RHB Digital Rehabilitation”)

**Table 1. Digital Rehabilitation competence levels (mean and standard deviation) in educators, students and rehabilitation professionals. \*p<0.05.**

Competence domain	Educators	Students	Rehabilitation professionals
<i>Information and data literacy</i>	<b>3.71</b> <b>(0.76)</b>	<b>3.43</b> <b>(0.75)*</b>	3,59 (0.82)
<i>Communication and collaboration</i>	3.46 (0.81)	3.33 (0.76)	3,35 (0.82)
<i>Digital content creation</i>	3.13 (0.80)	2.94 (0.82)	2.96 (0.97)
<i>Safety</i>	3.09 (1.14)	3.16 (0.92)	3.12 (1.03)
<i>Problem solving</i>	2.90 (0.91)	2.96 (0.81)	2.92 (0.95)
<i>Specific competences for rehabilitation</i>	3.22 (1.11)	3.01 (0.98)	3.24 (0.99)

**Table 2. Learning needs on DR identified by the participants in the focus groups.**

Learning needs	Knowledge/skills required	
Digital competencies	eHealth literacy	Searching and selecting reliable sources of information about health issues.
	Communication skills	Specific communication skills when using technology-driven communication in rehabilitation.
	Technical skills	Ability to use digital technologies in rehabilitation.
Ethics and regulation	Confidentiality	
	Responsibilities	
	Legal framework for application of digital technologies in rehabilitation	Knowledge about the policies for the use of DR (data protection, coverage/ reimbursement of costs for the healthcare professional and for the user)
Specific DR knowledge/skills	Areas/fields of application of DR	Knowing the field of applications of DR and recognizing the value for the user. This includes being able to identify the benefits and barriers of DR based on the needs of the user.

Findings and conclusions will be published in a format of discussion papers and distributed widely through the networks of program partners and target groups. The findings are also summarized into the following tables.

Results will be widely disseminated through websites, social media, multiplier events and through new open learning opportunities. Directly, the project engages around 300 rehabilitation experts in Europe. Indirectly, through dissemination and data collection activities, it is expected that over thousand people will be contributing to final outcomes.

#### **4. Conclusions**

We have produced various intangible and tangible results leading to the achievement of the objectives. The transfer and impact of the project results influence higher education in rehabilitation fields. As the demand and need for rehabilitation continues to increase during a time of uncertainty, client-centered and cost-effective solutions are needed without compromising clients rights and rehabilitation processes, while ensuring the access to skills development for students, professionals and educators.

The participant higher education teachers and experts (in rehabilitation) will improve and update their professional and pedagogical competencies. They will acquire new knowledge and skills related to the digitalization of rehabilitation and especially in mobile solutions in rehabilitation. Students (bachelor and master students as target groups and end users) will develop their digital and professionals' competencies, learn about the various opportunities in rehabilitation and on the applicability of competences according to various client groups and needs. Health professionals (as target groups and end users) will gain new knowledge on the possibilities of digitalization in their everyday work. They will improve their digital and professional competences and the ability to apply and implement new technologies to the rehabilitation processes based on person-centred needs, specially with the digital content created in this project (the handbook and the e-learning course on digital rehabilitation).

Partners in the project (EU and Africa) will enhance the quality and excellence of the education. They also will be able to provide highly competitive education and to develop rehabilitation curricula through digitalization utilizing the international network.

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