WP2 - STATE-OF-THE-ART ANALYSIS AND RESTLESS PEDAGOGICAL FRAMEWORK

From the Best Practices to the Framework Development

Prepared by University of Beira Interior

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RESTLESS

GrantXpert

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EXECUTIVE SUMMARY

The project RESTLESS - empoweRing univErsity Students Through heaLth EntrepreneurShip trainings, aims to train and empower university students and graduates specialising in Medicine, Life Sciences, Engineering, Business, and ICT studies with entrepreneurial, digital, and green skills, and to promote the integration of entrepreneurship education these fields of knowledge, fostering a culture of innovation in healthcare for societal benefit. Five partners constitute the consortium led by the Uniwersytet Slaski (Poland), GrantXpert Consulting (Cyprus), The Factory P.C. (Greece), Klinikum der Universitaet Zu Koeln (Germany) and Universidade da Beira Interior (Portugal), five Working Packages (WP) will be implemented: WP1 Project Management, WP2 State-of-the-art analysis and RESTLESS Pedagogical Framework, WP3 Development of the RESTLESS Training Programme, WP4 Health Entrepreneurship Bootcamps and WP5 Dissemination, Sustainability & Exploitation.

The WP2 is focused on developing a comprehensive training model based on the target audience's insights, opinions, and needs. The goal is to create a specialised, standalone training program tailored to students and graduates in the areas mentioned. This program will equip them with the essential skills needed for the evolving health industry and empower them to either start their own business or pursue a career aligned with their ambitions and abilities. WP2 will serve as the foundation for the learning resources by conducting a detailed needs assessment, identifying training gaps in existing programs, and analysing current healthcare market trends and challenges.

This document outlines the educational framework for the training program, summarizing the key activities carried out in WP2, including gathering best practices through desk research, identifying market trends and challenges through expert focus groups, and assessing students' and graduates' training needs via university surveys.

From the best practices collected (cases of innovative startups or business ideas, incubators or accelerators, entrepreneurship programmes and courses), it was possible to see that there is growing concern and interest in fostering entrepreneurship in the healthcare tech industry. The inputs of the focus group were of great relevance. Some training topics for the RESTLESS course were suggested: funding and financial management, business planning, market analysis, regulatory landscape in healthcare, digital health technologies, ethics, leadership and team management, design thinking, project management and soft skills (resilience, effective communication and leadership). The questionnaire results indicated the need to improve all general skills and competencies (information analysis, managing and planning, sales and financing, working with people, achievement, innovativeness, autonomy, and self-confidence) and digital skills. From the pedagogical methods, the respondents would better prefer engaging in real-world projects, having more funding opportunities and mentorship, attending the course in the face-to-face modality and having a certificate or ECTS.

Based on the findings, the recommendations for a training program tailored to entrepreneurs in the healthcare sector are presented, including a pedagogical framework and its proposed content, focusing on modules related to soft skills (leadership, communication, creativity, etc.),

business opportunities and funding, pitching, business model, digital technologies, finances, and marketing.

RESUMO EXECUTIVO (PT)

O projeto RESTLESS - empoweRing univErsity Students Through health EntrepreneurShip trainings, visa formar e capacitar estudantes universitários e licenciados especializados em Medicina, Ciências da Vida, Engenharia, Gestão e TIC com competências empreendedoras, digitais e verdes, e promover a integração da educação para o empreendedorismo nestas áreas do conhecimento, promovendo uma cultura de inovação nos cuidados de saúde para benefício da sociedade. Cinco parceiros constituem o consórcio liderado pela Uniwersytet Slaski (Polónia), GrantXpert Consulting, Lda (Chipre), The Factory P.C. (Grécia), Klinikum der Universitaet Zu Koeln (Alemanha) e Universidade da Beira Interior (Portugal). Serão implementados cinco *Work Package* (WP): WP1 Gestão do Projeto, WP2 Análise do Estado da Arte e Quadro Pedagógico RESTLESS, WP3 Desenvolvimento do Programa de Formação RESTLESS, WP4 *Bootcamps* de Empreendedorismo na Saúde e WP5 Disseminação, Sustentabilidade & Exploração.

O WP2 está focado no desenvolvimento de um modelo de formação abrangente baseado nos sinais, opiniões e necessidades do público-alvo. O objetivo é criar um programa de formação especializado e autónomo, adaptado a estudantes e licenciados nas áreas já referidas. Este programa irá dotá-los das competências essenciais necessárias para o setor da saúde em evolução e capacitá-los para iniciar o seu próprio negócio, ou seguir uma carreira alinhada com as suas ambições e capacidades. O WP2 servirá de base para os recursos de aprendizagem, realizando uma avaliação detalhada das necessidades, identificando as lacunas de formação nos programas existentes e analisando as tendências e desafios atuais do mercado da saúde.

Este documento descreve a estrutura educativa para o programa de formação, resumindo as principais atividades realizadas no WP2, incluindo a recolha de melhores práticas através de pesquisa documental, a identificação de tendências e desafios de mercado através de grupos focais de especialistas e a avaliação das necessidades de formação de estudantes e graduados através de investigação universitária.

A partir das melhores práticas recolhidas (casos de *startups* ou ideias de negócio inovadoras, incubadoras ou aceleradores de negócio, programas e cursos de empreendedorismo), foi possível constatar que existe uma preocupação e interesse crescente em fomentar o empreendedorismo na indústria tecnológica da saúde. As contribuições do grupo de foco foram de grande relevância. Foram sugeridos alguns temas de formação para o curso RESTLESS: financiamento e gestão financeira, planeamento de negócios, análise de mercado, regulamentação em saúde, tecnologias digitais em saúde, ética, liderança e gestão de equipas, *design thinking*, gestão de projetos e competências transversais (resiliência, comunicação eficaz e liderança). Os resultados do questionário apontaram para a necessidade de melhorar todas as aptidões e competências gerais apresentadas (análise de informação, gestão e planeamento, vendas e financiamento, trabalho com pessoas, realização, inovação, autonomia e autoconfiança), bem como competências digitais. Dos métodos pedagógicos, os inquiridos referiram preferir envolver-se em projetos do mundo real,

ter mais oportunidades de financiamento e mentoria, frequentar o curso na modalidade presencial e obter um certificado ou créditos ECTS.

Com base nas conclusões, são apresentadas as recomendações para um programa de formação adaptado a empreendedores do setor da saúde, incluindo um enquadramento pedagógico e o conteúdo proposto, com foco em módulos relacionados com competências interpessoais (liderança, comunicação, criatividade, etc.), oportunidades de negócio e financiamento, *pitching*, modelo de negócio, tecnologias digitais, finanças e marketing.

STRESZCZENIE (PL)

Projekt RESTLESS - empowerRing univErsity Students Through heaLth EntrepreneurShip trainings ma na celu szkolenie i wzmocnienie pozycji studentów i absolwentów uniwersytetów specjalizujących się w medycynie, naukach przyrodniczych, inżynierii, biznesie i studiach ICT w zakresie umiejętności przedsiębiorczych, cyfrowych i ekologicznych oraz promowanie integracji edukacji w zakresie przedsiębiorczości w tych dziedzinach wiedzy, promowanie kultury innowacji w opiece zdrowotnej z korzyścią dla społeczeństwa. Pięciu partnerów tworzy konsorcjum pod przewodnictwem Uniwersytetu Śląskiego (Polska), GrantXpert Consulting, Lda (Cypr), The Factory P.C. (Grecja), Klinikum der Universitaet Zu Koeln (Niemcy) i Universidade da Beira Interior (Portugalia), pięć pakietów roboczych (WP) zostanie wdrożonych: WP1 Zarządzanie Projektem, WP2 Analiza aktualnego stanu wiedzy i Ramy Pedagogiczne RESTLESS, WP3 Opracowanie Programu Szkoleniowego RESTLESS, WP4 Bootcampy Przedsiębiorczości Zdrowotnej oraz WP5 Rozpowszechnianie, Trwałość i Wykorzystanie.

WP2 koncentruje się na opracowaniu kompleksowego modelu szkoleniowego opartego na spostrzeżeniach, opiniach i potrzebach grupy docelowej. Celem jest stworzenie specjalistycznego, samodzielnego programu szkoleniowego dostosowanego do potrzeb studentów i absolwentów w wymienionych obszarach. Program ten wyposaży ich w niezbędne umiejętności potrzebne w rozwijającej się branży medycznej i umożliwi im rozpoczęcie własnej działalności gospodarczej lub kontynuowanie kariery zgodnej z ich ambicjami i umiejętnościami. WP2 posłuży jako podstawa dla zasobów edukacyjnych poprzez przeprowadzenie szczegółowej oceny potrzeb, identyfikację luk szkoleniowych w istniejących programach oraz analizę aktualnych trendów i wyzwań na rynku opieki zdrowotnej.

Niniejszy dokument nakreśla ramy edukacyjne programu szkoleniowego, podsumowując kluczowe działania przeprowadzone w ramach WP2, w tym gromadzenie najlepszych praktyk poprzez badania źródeł wtórnych, identyfikację trendów rynkowych i wyzwań poprzez eksperckie grupy fokusowe oraz ocenę potrzeb szkoleniowych studentów i absolwentów za pomocą ankiet uniwersyteckich.

Na podstawie zebranych najlepszych praktyk (przypadki innowacyjnych startupów lub pomysłów biznesowych, inkubatory lub akceleratory, programy i kursy przedsiębiorczości) można było zauważyć, że rośnie zainteresowanie wspieraniem przedsiębiorczości w branży technologii medycznych. Wkład grupy fokusowej był bardzo istotny. Zasugerowano kilka tematów szkoleniowych dla kursu RESTLESS: finansowanie i zarządzanie finansami, planowanie biznesowe, analiza rynku, krajobraz regulacyjny w opiece zdrowotnej, cyfrowe technologie medyczne, etyka, przywództwo i zarządzanie zespołem, myślenie projektowe, zarządzanie projektami i umiejętności miękkie (odporność, skuteczna komunikacja i przywództwo). Wyniki kwestionariusza wskazały na potrzebę poprawy wszystkich ogólnych umiejętności i kompetencji (analiza informacji, zarządzanie i planowanie, sprzedaż i finansowanie, praca z ludźmi, osiągnięcia, innowacyjność, autonomia i pewność siebie) oraz umiejętności cyfrowych. Jeśli chodzi o metody pedagogiczne, respondenci woleliby

angażować się w rzeczywiste projekty, mieć więcej możliwości finansowania i mentoringu, uczestniczyć w kursie w trybie bezpośrednim oraz posiadać certyfikat lub ECTS.

W oparciu o wyniki badań przedstawiono zalecenia dotyczące programu szkoleniowego dostosowanego do potrzeb przedsiębiorców z sektora opieki zdrowotnej, w tym ramy pedagogiczne i proponowane treści, koncentrujące się na modułach związanych z umiejętnościami miękkimi (przywództwo, komunikacja, kreatywność itp.), możliwościami biznesowymi i finansowaniem, pitchingiem, modelem biznesowym, technologiami cyfrowymi, finansami i marketingiem.

ZUSAMMENFASSUNG (DE)

Das Projekt RESTLESS – Stärkung von Universitätsstudenten durch Schulungen zum Thema „Health EntrepreneurShip“ – zielt darauf ab, Universitätsstudenten und -absolventen, die sich auf Medizin, Biowissenschaften, Ingenieurwesen, Wirtschaft und IKT spezialisiert haben, unternehmerische, digitale und grüne Fähigkeiten zu vermitteln und die Integration von unternehmerischer Bildung in diese Wissensbereiche zu fördern, um eine Innovationskultur im Gesundheitswesen zum Nutzen der Gesellschaft zu fördern. Das Konsortium besteht aus fünf Partnern unter der Leitung der Uniwersytet Slaski (Polen), GrantXpert Consulting, Lda (Zypern), The Factory P.C. (Griechenland), Klinikum der Universität zu Köln (Deutschland) und Universidade da Beira Interior (Portugal). Es werden fünf Arbeitspakete (WP) umgesetzt: WP1 Projektmanagement, WP2 Analyse des aktuellen Stands der Technik und RESTLESS-Pädagogischer Rahmen, WP3 Entwicklung des RESTLESS-Schulungsprogramms, WP4 Bootcamps für Gesundheitsunternehmertum und WP5 Verbreitung, Nachhaltigkeit und Nutzung.

Das WP2 konzentriert sich auf die Entwicklung eines umfassenden Schulungsmodells, das auf den Erkenntnissen, Meinungen und Bedürfnissen der Zielgruppe basiert. Ziel ist es, ein spezialisiertes, eigenständiges Schulungsprogramm zu erstellen, das auf Studierende und Absolventen in den genannten Bereichen zugeschnitten ist. Dieses Programm wird sie mit den grundlegenden Fähigkeiten ausstatten, die für die sich entwickelnde Gesundheitsbranche erforderlich sind, und sie befähigen, entweder ein eigenes Unternehmen zu gründen oder eine Karriere zu verfolgen, die ihren Ambitionen und Fähigkeiten entspricht. Das Arbeitspaket 2 dient als Grundlage für die Lernressourcen, indem es eine detaillierte Bedarfsanalyse durchführt, Ausbildungslücken in bestehenden Programmen identifiziert und aktuelle Trends und Herausforderungen auf dem Gesundheitsmarkt analysiert.

Dieses Dokument skizziert den Bildungsrahmen für das Ausbildungsprogramm und fasst die wichtigsten Aktivitäten des Arbeitspakets 2 zusammen, darunter das Sammeln bewährter Verfahren durch Sekundärforschung, das Identifizieren von Markttrends und Herausforderungen durch Experten-Fokusgruppen und die Bewertung des Ausbildungsbedarfs von Studierenden und Absolventen durch Umfragen an Universitäten.

Anhand der gesammelten best prectices (Fälle von innovativen Start-ups oder Geschäftsideen, Inkubatoren oder Acceleratoren, Programmen und Kursen für Unternehmertum) konnte festgestellt werden, dass das Interesse an der Förderung des Unternehmertums in der Branche der Gesundheitstechnologie wächst. Die Beiträge der Fokusgruppe waren von großer Bedeutung. Es wurden einige Schulungsthemen für den RESTLESS-Kurs vorgeschlagen: Finanzierung und Finanzmanagement, Geschäftsplanung, Marktanalyse, regulatorische Landschaft im Gesundheitswesen, digitale Gesundheitstechnologien, Ethik, Führung und Teammanagement, Design Thinking, Projektmanagement und Soft Skills (Resilienz, effektive Kommunikation und Führung). Die Ergebnisse des Fragebogens zeigten, dass alle allgemeinen Fähigkeiten und Kompetenzen (Informationsanalyse, Management und Planung, Vertrieb und Finanzierung, Arbeit mit

Menschen, Leistung, Innovationsfähigkeit, Autonomie und Selbstvertrauen) sowie digitale Fähigkeiten verbessert werden müssen. Was die pädagogischen Methoden betrifft, würden die Befragten es vorziehen, sich an realen Projekten zu beteiligen, mehr Finanzierungsmöglichkeiten und Mentoring zu erhalten, den Kurs in Präsenzform zu besuchen und ein Zertifikat oder ECTS zu erhalten.

Auf der Grundlage der Ergebnisse werden Empfehlungen für ein Schulungsprogramm vorgelegt, das auf Unternehmer im Gesundheitswesen zugeschnitten ist, einschließlich eines pädagogischen Rahmens und der vorgeschlagenen Inhalte, wobei der Schwerpunkt auf Modulen liegt, die sich auf Soft Skills (Führung, Kommunikation, Kreativität usw.), Geschäftsmöglichkeiten und Finanzierung, Pitching, Geschäftsmodell, digitale Technologien, Finanzen und Marketing beziehen.

ΠΕΡΙΛΗΨΗ (GR)

Το έργο RESTLESS - empoweRing univErsity Students Through heaLth EntrepreneurShip trainings, έχει ως στόχο να εκπαιδεύσει και να ενδυναμώσει φοιτητές και αποφοίτους πανεπιστημίων που ειδικεύονται στην Ιατρική, τις Βιοεπιστήμες, τη Μηχανική, τις Επιχειρήσεις και τις ΤΠΕ με επιχειρηματικές, ψηφιακές και πράσινες δεξιότητες και να προωθήσει την ενσωμάτωση της επιχειρηματικής εκπαίδευσης σε αυτούς τους τομείς γνώσης, καλλιεργώντας μια κουλτούρα καινοτομίας στην υγειονομική περίθαλψη προς όφελος της κοινωνίας. Πέντε εταίροι αποτελούν την κοινοπραξία με επικεφαλής το Uniwersytet Slaski (Πολωνία), ενώ συμμετέχουν οι GrantXpert Consulting (Κύπρος), The Factory P.C. (Ελλάδα), Klinikum der Universitaet Zu Koeln (Γερμανία) και Universidade da Beira Interior (Πορτογαλία). Θα υλοποιηθούν πέντε πακέτα εργασίας (WP –Work Packages/ Πακέτα Εργασίας): WP1 Διαχείριση του έργου, WP2 Ανάλυση της κατάστασης προόδου και παιδαγωγικό πλαίσιο RESTLESS, WP3 Ανάπτυξη του εκπαιδευτικού προγράμματος RESTLESS, WP4 Bootcamps επιχειρηματικότητας στον τομέα της υγείας και WP5 Διάδοση, βιωσιμότητα και αξιοποίηση.

Το WP2 επικεντρώνεται στην ανάπτυξη ενός ολοκληρωμένου μοντέλου κατάρτισης με βάση τις γνώσεις, τις απόψεις και τις ανάγκες του κοινού-στόχου. Στόχος είναι η δημιουργία ενός εξειδικευμένου, αυτόνομου προγράμματος κατάρτισης προσαρμοσμένου σε φοιτητές και αποφοίτους στους τομείς που αναφέρθηκαν. Το πρόγραμμα αυτό θα τους εξοπλίσει με τις βασικές δεξιότητες που απαιτούνται για τον εξελισσόμενο κλάδο της υγείας και θα τους δώσει τη δυνατότητα είτε να ξεκινήσουν τη δική τους επιχείρηση είτε να ακολουθήσουν μια καριέρα που να ευθυγραμμίζεται με τις φιλοδοξίες και τις ικανότητές τους. Το WP2 θα αποτελέσει τη βάση για τους μαθησιακούς πόρους, πραγματοποιώντας λεπτομερή αξιολόγηση των αναγκών, εντοπίζοντας τα κενά κατάρτισης στα υφιστάμενα προγράμματα και αναλύοντας τις τρέχουσες τάσεις και προκλήσεις της αγοράς υγειονομικής περίθαλψης.

Το παρόν έγγραφο περιγράφει το εκπαιδευτικό πλαίσιο για το πρόγραμμα κατάρτισης, συνοψίζοντας τις βασικές δραστηριότητες που διεξήχθησαν στο WP2, συμπεριλαμβανομένης της συλλογής βέλτιστων πρακτικών μέσω έρευνας πεδίου, του προσδιορισμού των τάσεων και των προκλήσεων της αγοράς μέσω ομάδων εστίασης εμπειρογνωμόνων και της αξιολόγησης των εκπαιδευτικών αναγκών των φοιτητών και των αποφοίτων μέσω πανεπιστημιακών ερευνών.

Από τις βέλτιστες πρακτικές που συλλέχθηκαν (περιπτώσεις καινοτόμων νεοφυών επιχειρήσεων ή επιχειρηματικών ιδεών, επιταχυντές, προγράμματα και μαθήματα επιχειρηματικότητας), διαπιστώθηκε ότι υπάρχει αυξανόμενη ανησυχία και ενδιαφέρον για την προώθηση της επιχειρηματικότητας στον κλάδο της τεχνολογίας της υγείας. Οι εισηγήσεις της ομάδας εστίασης ήταν πολύ σημαντικές. Προτάθηκαν ορισμένα θέματα κατάρτισης για το μάθημα RESTLESS: χρηματοδότηση και οικονομική διαχείριση, επιχειρηματικός σχεδιασμός, ανάλυση αγοράς, ρυθμιστικό τοπίο στην υγειονομική περίθαλψη, ψηφιακές τεχνολογίες υγείας, ηθική, ηγεσία και διαχείριση ομάδων, σχεδιαστική σκέψη, διαχείριση έργων και κοινωνικές δεξιότητες (ανθεκτικότητα, αποτελεσματική επικοινωνία και ηγεσία). Τα αποτελέσματα του ερωτηματολογίου έδειξαν την ανάγκη βελτίωσης όλων των γενικών δεξιοτήτων και ικανοτήτων (ανάλυση πληροφοριών, διαχείριση και σχεδιασμός, πωλήσεις και

χρηματοδότηση, εργασία με ανθρώπους, επίτευξη στόχων, καινοτομία, αυτονομία και αυτοπεποίθηση) και των ψηφιακών δεξιοτήτων. Από τις παιδαγωγικές μεθόδους, οι ερωτηθέντες θα προτιμούσαν περισσότερο την ενασχόληση με πραγματικά έργα, την ύπαρξη περισσότερων ευκαιριών χρηματοδότησης και καθοδήγησης, την παρακολούθηση του μαθήματος με τον δια ζώσης τρόπο και την ύπαρξη πιστοποιητικού ή ECTS.

Με βάση τα ευρήματα, παρουσιάζονται οι συστάσεις για ένα πρόγραμμα κατάρτισης προσαρμοσμένο σε επιχειρηματίες στον τομέα της υγείας, συμπεριλαμβανομένου ενός παιδαγωγικού πλαισίου και του προτεινόμενου περιεχομένου του, με έμφαση σε ενότητες που αφορούν τις κοινωνικές δεξιότητες (ηγεσία, επικοινωνία, δημιουργικότητα κ.λπ.), τις επιχειρηματικές ευκαιρίες και τη χρηματοδότηση, το επιχειρηματικό μοντέλο, τις ψηφιακές τεχνολογίες, τα οικονομικά και το μάρκετινγκ.

1. Introduction

Work Package 2 (WP2) aims to design a holistic training model based on the target group's views, perceptions, attitudes, and training needs to create a standalone and customised training course for students and graduates in Medicine, Life Sciences, Engineering, business and ICT-related disciplines that will equip them with the skills demanded by the health industry of the future and empower them to start their own business or pursue a career that fits their aspirations and skillsets. Essentially, WP2 will provide the backbone for the learning resources by entailing an in-depth needs analysis to map the training needs of the target group, existing gaps in similar training programmes, and the trends and challenges of the healthcare market.

This document presents a pedagogical framework for the training programme, which will summarise the activities developed in WP2, namely: Collection of best practices via desk research (section 2), Mapping the market's trends and challenges via focus groups with industry experts (section 3), and Mapping students and graduates' training needs via surveys conducted by universities (section 4).

According to the main findings of the developed activities, recommendations for a training program for entrepreneurs in the healthcare industry are proposed in section 5, comprising a pedagogical framework and its content. Lastly, the main conclusions are displayed in section 6.

2. Best Practices

All national teams collected case studies of the best practices from analysing a specific situation referring to real life. The performed desk research resulted in a compilation of 10 best practices of innovative healthcare companies or training, incubator or accelerator programmes supporting entrepreneurs in the healthcare industry.

The GrantXpert Consulting Ltd team (Cyprus) included healthcare companies to illustrate exemplary characteristics of successful businesses in this industry. Such factors include a focus on user-centric design, involvement in industry-academia projects and development of technologies to improve healthcare management.

The University Hospital Cologne team (Germany) selected two start-up companies highlighting the development of technologies to facilitate access to up-to-date medical research results and other technologies, allowing incremental learning while guaranteeing high data protection standards.

The IED team (Greece) presented a venture of an entrepreneurship development institute and an innovation management consulting firm, pointing out the providence of physical infrastructures that encourage knowledge sharing and collaborative networks, “play and learn” activities, organisation of community Hackathons, and providence of accelerator programmes with top international experts support in business ideas development.

The team from the University of Beira Interior (Portugal) presented the case of an advanced training programme related to entrepreneurship in the health sector and an incubator located in the Faculty of Health Sciences. The case studies selection emphasised the organisation of events based on a multidisciplinary approach to generate new business ideas and share knowledge, providence of training with a co-creative approach, dissemination of innovation contests and participation in events with students from university and local schools to strengthen their entrepreneurial skills.

The team from the University of Silesia in Katowice (Poland) selected an educative approach that allows students from different courses to choose classes in other fields of study, focusing on topics related to modern challenges. Under this approach, students from various courses could enrol in an entrepreneurship module. Allowing multidisciplinary learning in classes is pointed out as a good practice. This team also presented the case of the ‘Hook for Health’ event, a design and training contest that affords contact between academia and experienced mentors from the medical, technology and business sectors and provides financial prizes and awards for the best projects.

The main best practices for each case presented by the different partners are explained in more detail in Annex I.

3. Insights from the Focus Group

All partners performed field research involving 2 hour-long focus groups with around 5 participants comprising 1 partner representative, 2 entrepreneurs from the healthcare industry, 1 university lecturer in Business Administration/Entrepreneurship and 1 career advisor to facilitate mapping of the healthcare market's trends and challenges.

The participants were invited to discuss (1) the current trends in the healthcare market in their country, (2) the challenges this sector is facing and how to overcome them, (3) the specific skills currently in demand in the health market, (4) the importance of training to business creation in the scope of the health market and how to introduce it in the courses related to health, (5) relevant topics/modules to include in the course/training programme to be developed in the scope of the RESTLESS project.

The GrantXpert Consulting Ltd team (Cyprus) indicated enhanced residential care services, personalized medicine and remote patient monitoring as current trends. The identified challenges include barriers to navigating intricate regulatory frameworks, funding constraints, cultural resistance to innovation, and the need for specialised skills. Among the current skills in demand in the health market, interviewees identified strong communication skills, resilience, leadership abilities, regulatory acumen, and proficiency in digital health technologies, data analytics, and clinical research methodologies. Regarding the importance of training in business creation, the report from GrantXpert Consulting Ltd highlighted that training can facilitate regulatory compliance, promote a supportive ecosystem that encourages experimentation and innovation, and create networking opportunities. The following topics were considered relevant for a training programme: funding and financial management, business planning and strategy development, regulatory landscape in healthcare, clinical trial management, digital health technologies, and soft skills.

The University Hospital Cologne team (Germany) referred to the current digital transformation trends, namely the delay in the adoption and uptake of digital technologies, data protection, and the development of apps. The main identified challenge includes a lack of literacy and entrepreneurship skills. Under this topic, some insights were provided to cope with this challenge, such as investing in education to enhance transdisciplinary collaboration skills, teaching how to make decisions under uncertainty, and applying a design thinking approach. Among the current skills in demand in the health market are coming up with unexpected questions to expand one's understanding of business opportunities and the ability to focus on users' needs. Regarding the importance of training in business creation, it was highlighted that it is important to provide practical experiences through participation in projects, encouraging more confidence in students as they develop their practical skills. The following topics to include in a training programme were suggested: financial literacy, ethics of business, and design thinking. It was also recommended that successful and non-successful case studies of entrepreneurship be analysed and the fomentation of a discussion-based style.

According to Focus Group results reported by the JOIST Innovation Park team (Greece), current trends in the healthcare sector involve the interest in blockchain and artificial intelligence, despite the gap between this interest and the actual level of implementation of such technologies and digital transformation for medical training and hospital management software in the form of cloud servers, healthcare support applications and augmented reality

technologies. Other trends in the Greek healthcare sector are patient-centred approaches, interoperability, preventive medicine, and more funding availability at various stages of business development. Regarding challenges, it was highlighted the complexity of integrating Artificial Intelligence with Software as a Medical Device associated with the regulatory landscape. The increasing ageing population, the high literacy rate and consequent higher expectations, and the need for more immersive technology applications, such as virtual reality (VR) for patient care and medical training, are also significant challenges, according to focus group results. To respond to the referred current trends and challenges in the industry, there is a need to develop data processing and analytics skills and expertise in immersive technologies, such as virtual reality and augmented reality. Given the fast evolution of technology and its incorporation into the healthcare sector, entrepreneurs need to develop technical competencies and adaptability to new technologies. However, soft skills such as communication, teamwork, and critical thinking play a crucial role. The focus group discussion emphasised the importance of training in developing interpersonal skills, integrating flexible and adaptive curricula, and maintaining a lifelong learning approach to keep pace with the sector's evolving demands. It also revealed that collaboration with specialists from successful healthcare companies and practical activities, namely curricular internships and cross-functional teamwork, can enhance useful entrepreneurial skills. The proposed training topics could include exchanges or virtual collaborations with professionals and students from other countries and cultures, offering a global perspective in training.

The University of Beira Interior team (Portugal) mentioned the following current trends: blockchain integration in healthcare, digital transformation (comprising software and app development for hospital management as well as the use of the cloud for data processing), artificial intelligence for more personalised diagnosis, patient-centred approach, interoperability, increased funding opportunities in the future and preventive medicine. From the perspective of the participants, the main current challenges for the healthcare industry are the complexity of regulations concerning new technologies using Software as a Medical Device and Artificial Intelligence, and slowness in responding to market needs. The growing population ageing on the one hand and the greater population literacy on the other are additional challenges. Additional barriers are the need for better management, the unfavourable personal circumstances of potential entrepreneurs, the lack of knowledge about opportunities to support entrepreneurship, and the interdisciplinarity shortage in higher education institutions. The mentioned specific skills currently in demand in the health market were related to work experience, data processing skills, and soft skills and mindset, such as adaptability, proactivity, spontaneity, and accepting mistakes and “no”. It was stated in the focus group that training can encourage the development of soft skills through Interpersonal skills courses. The application of pedagogical innovation processes, the flexibility of curricula, encouraging lifelong learning perspective, including testimonials from former students and/or industry professionals in teaching activities, co-creation processes between industry and academia, providing practical experiences, and encouraging multidisciplinary lessons and theses/dissertations execution can also have a positive contribution to the development of entrepreneurial skills. The participants consider it relevant to include topics on financial literacy, leadership and team management, and project management in a training programme of entrepreneurship, while promoting practical mobility experiences.

The University of Silesia in Katowice team (Poland) referred to current trends: personalised medicine, artificial intelligence, professional medical solutions related to ultrasound, and

various types of robotic applications, not only surgical but solutions such as punctures and mechatronics. According to the participants, the key challenges in the healthcare sector are convincing the market and customers about the value of an innovative solution, getting the required certification, and reversion of certification process (used to be EU certification first, FDA certification later) thus deployment of technology first outside Europe, as it is somewhat easier to obtain certification in the US than in Europe. Furthermore, restricting patient access to the latest technology and the continual raising of the market entry threshold in terms of costs and duration associated with certification are also relevant challenges. The report pointed out a set of skills to be developed, such as project management and leadership; skills and knowledge regarding medical certification processes and quality management systems for medical designers and manufacturers; production quality management according to EU and US certification guidelines; cooperation in and international teams; knowledge of cultural differences among team members; skills and knowledge regarding medical certification processes and quality management systems.

It was concluded that training for business creation in the healthcare sector should be focused on organisational management and empowering potential entrepreneurs to build and maintain good relations with the company's internal and external environment. On this basis, key aspects of training are around a reflection of:

- How to strengthen team management from a leader’s perspective and build self-awareness of leaders;
- How to build relationships with colleagues and the company's external and internal environment;
- Where and how to effectively look for and raise funds to develop a start-up;
- How to manage a budget, develop a project and prepare for the next steps (certification, implementation);
- Preparing investment pitches.

The participants consider as well relevant to:

- Make students/graduates aware of what the role of a leader is and prepare them for that role;
- Train communication skills and pitches, focusing on how to convince investors.

The main conclusions of all focus group reports are summarised in Annex II.

4. Students and Graduates' Training Needs

A survey was elaborated to identify entrepreneurship education needs and preferences for the healthcare sector (Annex III). The answer options mainly use a 5-point Likert scale to measure the respondent's viewpoint (1- Totally Disagree, 2- Disagree, 3- Neither Agree nor Disagree, 4- Agree, 5- Totally Agree). The questionnaire comprised six main sections to analyse students'/graduates' perspectives: intention to entrepreneurship, skills and competencies, learning activities, delivery mode, assessment and certification, and respondent information. Note that for this consolidated report, the results were aggregated (all countries).

4.1. Entrepreneurial Intention

According to the sum of the values of the relative frequency of the responses "agree" and "totally agree" in Figure 1, respondents mainly associate entrepreneurship with the opportunity to fulfil themselves and their dreams (75,2%), with seizing opportunities that are not an option when being an employee (68,9%), and with being completely autonomous in their professional decisions (50,4%). When analysing the mean values, it can be observed that only the two first referred affirmations had a mean value higher than 3,5.

2. Regarding my entrepreneurial intentions:

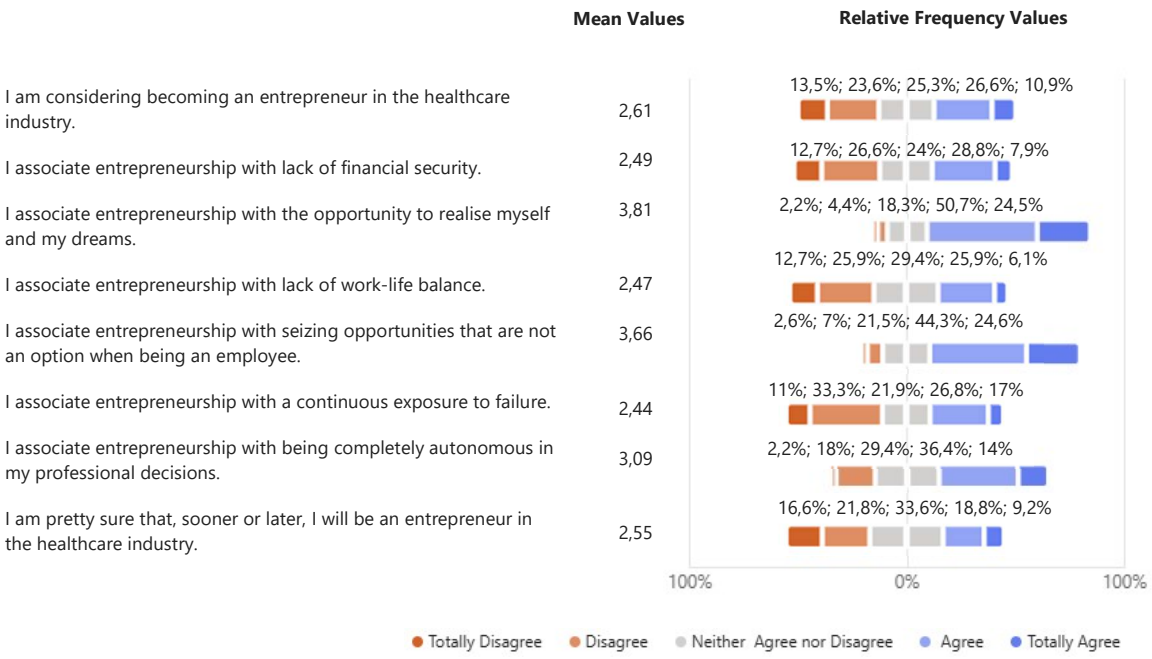

Figure 1. Results of Question 2 Responses

4.2. Skills and competencies

The second part of the questionnaire, comprising questions 3 to 13, intended to identify the skills and competencies considered relevant for entrepreneurship education from the respondents' viewpoint.

As exhibited in Figure 2, all the items included in question 3 presented a relative frequency of "agree" and "totally agree" higher than 50%, suggesting that all items were considered relevant for training in the scope of the development of analysing information skills by most of the

participants. In conformity, the mean values of the attributed punctuation in the 5-point Likert scale also indicate that all the analysing information skills considered in this question are important from the viewpoint of the participants' average, with all mean values higher than 4,5.

*3. If I want to start my own business in the healthcare industry, it will be very important to receive training in the **analysing information** skills of*

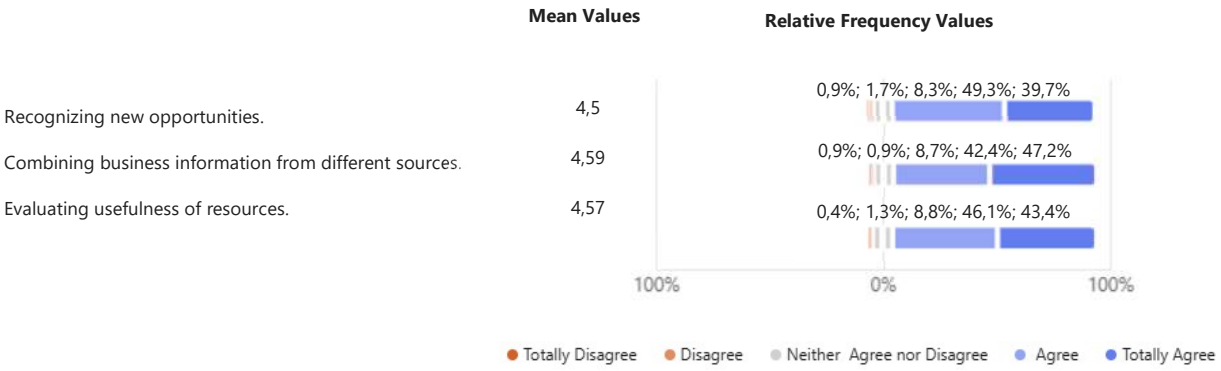

Figure 2. Results of Question 3 Responses

Figure 3 shows that more than 50% of the participants attributed the response “agree” or “totally agree” to all items of question 4. It can be highlighted that 52,4% totally agreed on the importance of learning how to develop an action plan which includes the basic steps to achieve the goals of an activity/idea. However, identifying appropriate business strategies was the skill with the highest mean score value (4,66).

*4. If I want to start my own business in the healthcare industry, it will be very important to receive training in the **managing and planning** skills of*

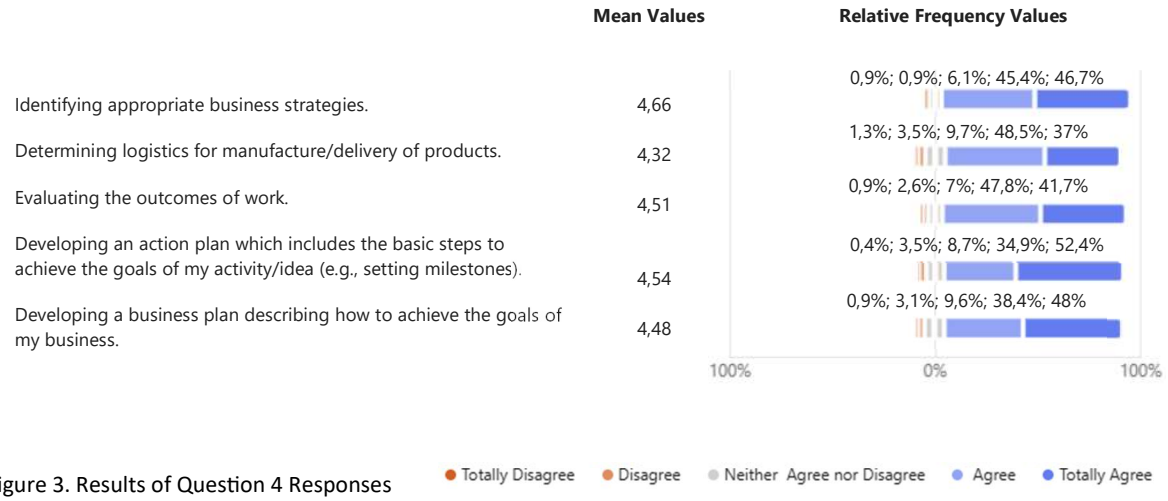

Figure 3. Results of Question 4 Responses

Concerning sales, financing and contracting, more than 50% of the participants agreed or totally agreed that it would be very important to receive training in all presented skills (Figure 4). Drawing up and managing budgets, negotiating contracts, and raising funds have the three highest relative frequency values of “totally agree” response, 45,9%, 45% and 41,7%,

respectively. However, the skill with the highest mean value of importance is negotiating contracts (4,52).

*5. If I want to start my own business in the healthcare industry, it will be very important to receive training in the **sales, financing, and contracting** skills of*

Figure 4. Results of Question 5 Responses

Another key competence for entrepreneurship is working with people. All items mentioned in question 6 concerning this competence had a relative frequency higher than 50% of responses "agree" and "totally agree". However, 53,3% of the respondents totally agree that identifying strengths and weaknesses of their own and of their team is a very important skill and 52,4% of the respondents totally agree that skills of managing stress and obtaining balance are also very important. However, the skills with the highest mean value of the 5-point Likert scale is developing motivated teams of people (4,59).

*6. If I want to start my own business in the healthcare industry, it will be very important to receive training in the **working with people** skills of*

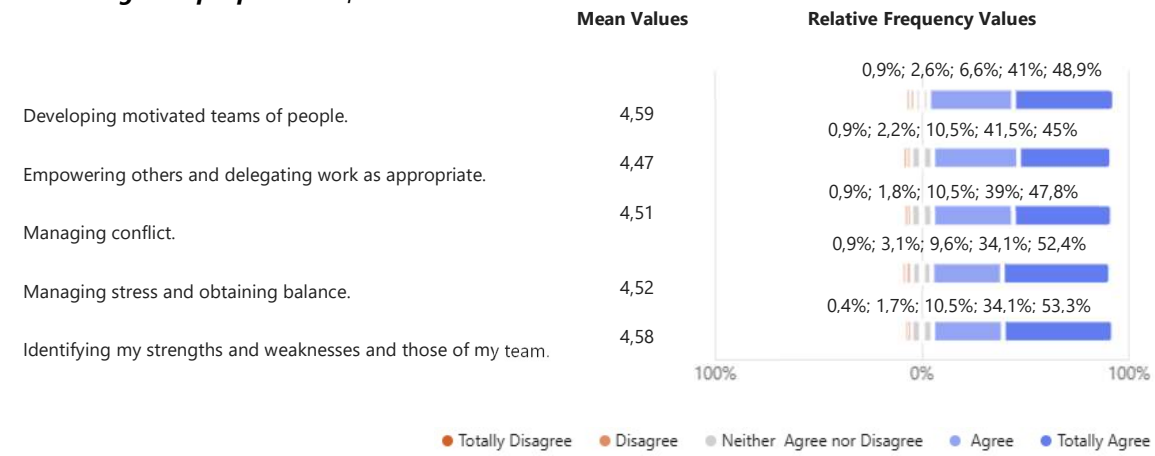

Figure 5. Results of Question 6 Responses

Question 7 aimed at assessing the importance of a set of skills related with dealing with risk and ambiguity. All the skills were considered important by more than 50% of the participants,

including both “agree” and “totally agree” responses. The skill of taking bold and high-impact actions to achieve the company's objectives stand out as 70% of the participants agreed or totally agreed with their importance. This skill has also the highest mean value indicating participants agree with its importance (3,77), though the answers regarding all skills have a mean value inferior to 4.

*7. If I want to start my own business in the healthcare industry, it will be very important to receive training in **dealing with risk and ambiguity** skills of*

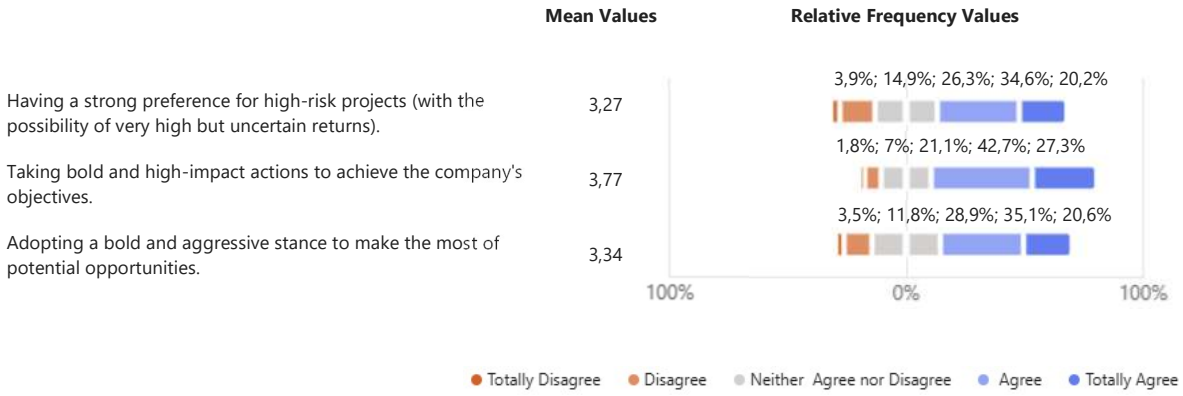

Figure 6. Results of Question 7 Responses

Regarding achievement skills, the answers to question 8 (Figure 7) revealed that most part of the respondents considered important all referred skills, being learning as much as possible from business the skill with the highest relative frequency rate of agree and totally agree responses (87,7%), corresponding also to the answer with higher mean score value (4,52).

*8. If I want to start my own business in the healthcare industry, it will be very important to receive training in the **achievement** skills of*

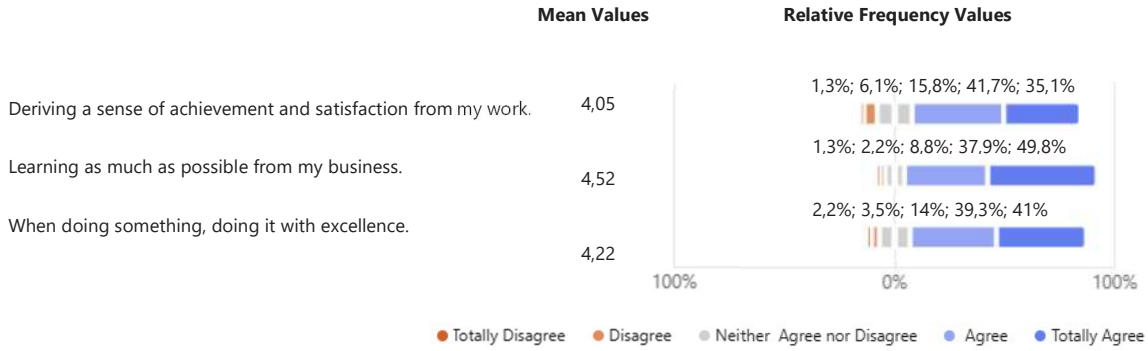

Figure 7. Results of Question 8 Responses

As it can be observed in Figure 8, most of the respondents agreed with the importance of the mentioned innovativeness skills. The one with the highest relative frequency of the responses “agree” and “totally agree” is the skill of always searching new and better ways of doing things (87,4%). This skill also exhibited the highest mean score value (4,43).

*9. If I want to start my own business in the healthcare industry, it will be very important to receive training in the **innovativeness** skills of*

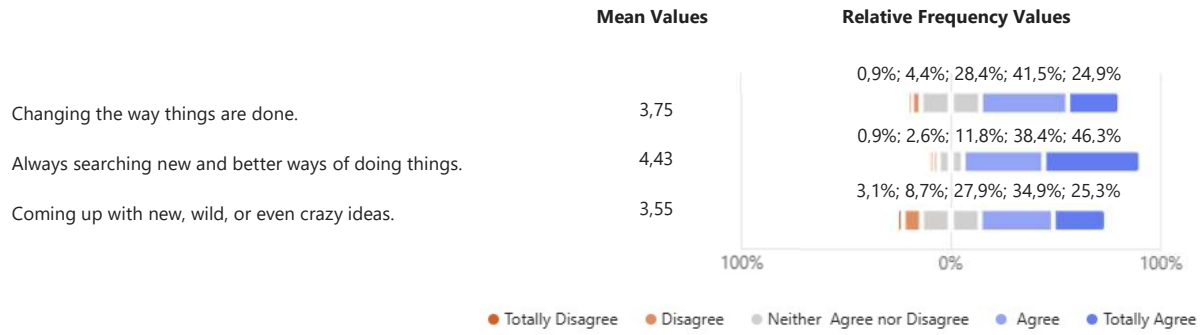

Figure 8. Results of Question 9 Responses

Figure 9 shows that the respondents consider it important to develop dynamism skills in initiating actions to which competitors respond (68,9%) and being the first to introduce new products/services, management techniques, operating technologies, etc. (68,8%). Nonetheless, the mentioned dynamism skills received a mean score inferior to 4, with the highest mean score of 3,83 for being the first to introduce new products/services, management techniques, operating technologies, etc. Actively seeking to drive competitors out of the market was not considered an important skill by most participants, with a sum of relative frequencies of “agree” and “totally agree” responses of 46%.

*10. If I want to start my own business in the healthcare industry, it will be very important to receive training in the **dynamism** skills of*

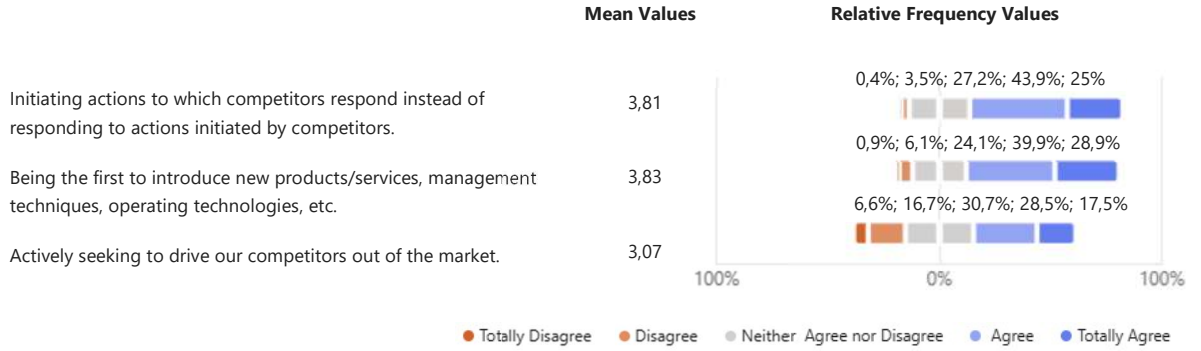

Figure 9. Results of Question 10 Responses

Concerning autonomy skills, most of the participants agreed on the importance of all the referred skills. The skill with the highest relative frequency values of “agree” and “totally agree” responses is accepting both positive and negative consequences of oneself decisions and actions (83,8%). The skill of making things happen instead of waiting and watching things happen presents the highest mean score (4,35).

*11. If I want to start my own business in the healthcare industry, it will be very important to receive training in the **autonomy** skills of*

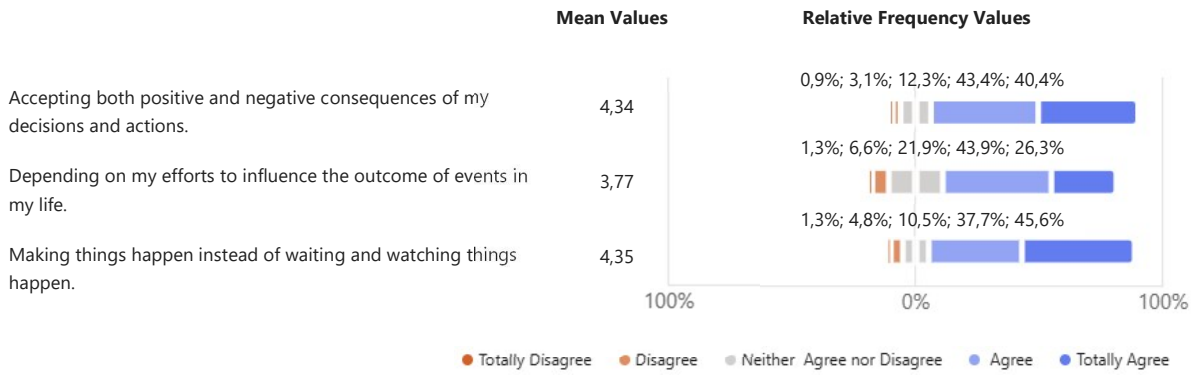

Figure 10. Results of Question 11 Responses

Most participants in the questionnaire considered all the mentioned self-confidence skills relevant. The ability to cope under new, untested conditions has the highest mean score (4,25) and also the higher value of relative frequency values of “agree” and “totally agree” responses (80,60%).

*12. If I want to start my own business in the healthcare industry, it will be very important to receive training in the **self-confidence** skills of*

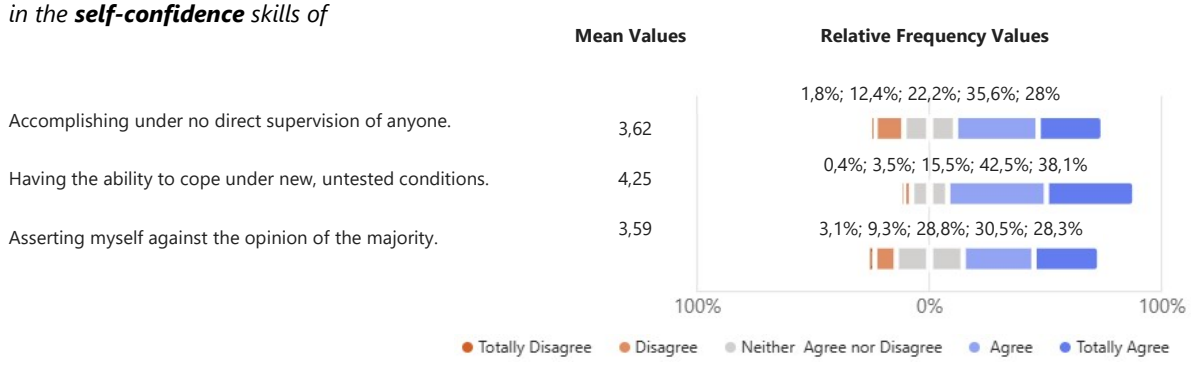

Figure 11. Results of Question 12 Responses

Given the significant development of technology in the healthcare sector, question 13 aimed to identify the most important digital skills for healthcare entrepreneurship. Despite all the referred digital skills being considered relevant by most of the participants, it can be highlighted that Cybersecurity Awareness in Health IT has the highest mean score (4,39) and also the highest sum of relative frequency values of “agree” and “totally agree” responses (82,7%). Electronic Health Record (EHR) Management was considered important by the second biggest percentage of participants (82,3%), with a mean score of 4,36.

*13. If I want to start my own business in the healthcare industry, it will be very important to receive training in the **digital skills** of*

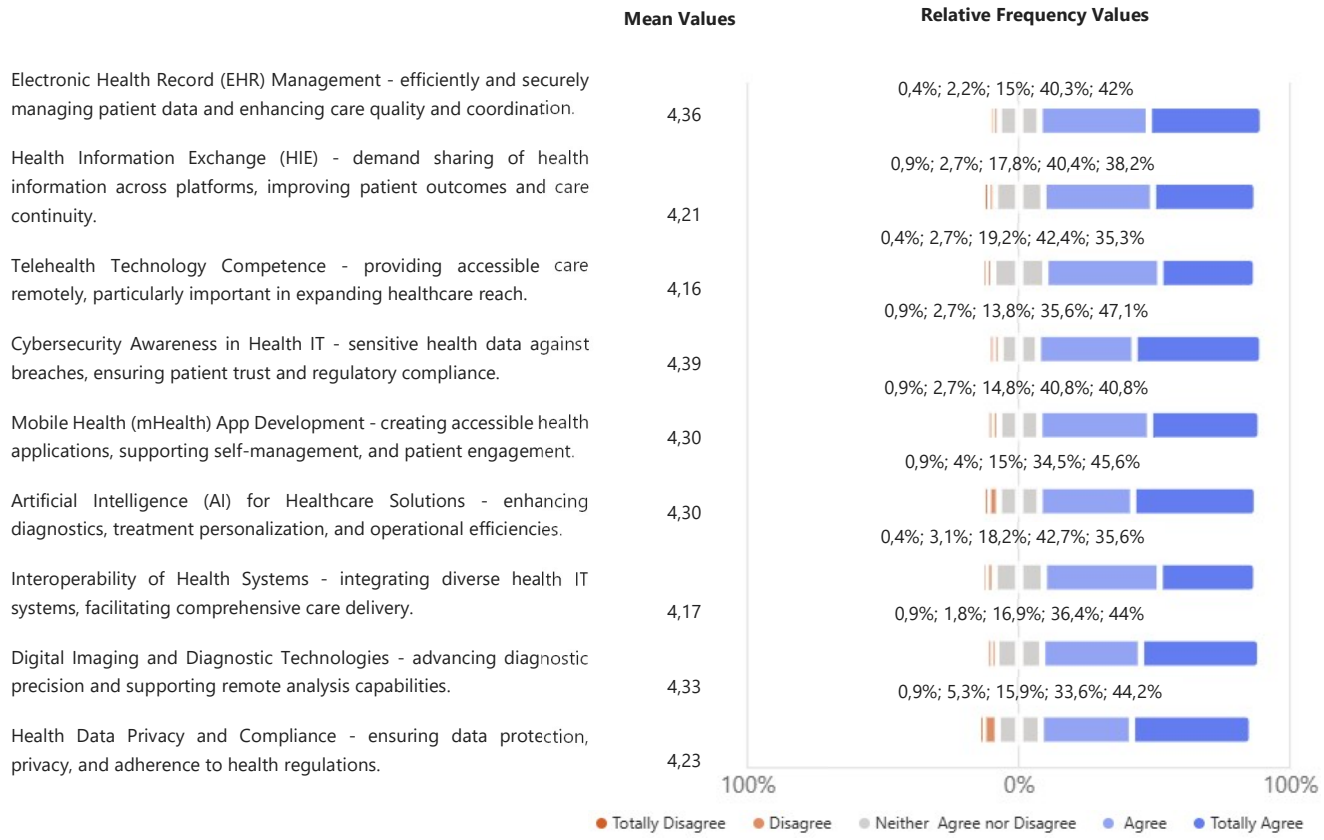

Figure 12. Results of Question 13 Responses

4.3. Learning activities (Questions 14 to 21)

Questions 14 to 21 aimed to identify training programs known by the participants, their utility for fostering entrepreneurship, pedagogical methods and useful areas of resources/support. The results exhibited in Figure 13 reveal that 89% of the participants were not aware of education/training programs specifically designed to help healthcare professionals develop entrepreneurial skills.

14. Are you aware of educational and training programs specifically designed to enhance entrepreneurial skills for healthcare professionals?

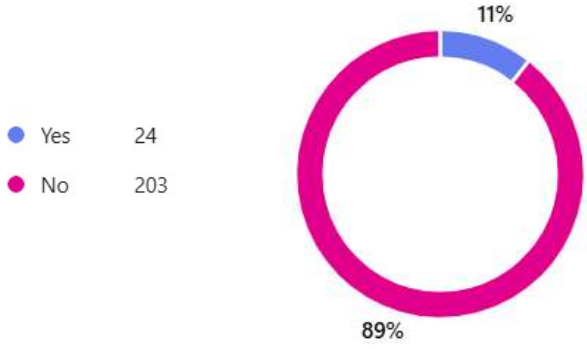

Figure 13. Results of Question 14 Responses

Figure 14 exhibits the 6 answers provided on examples of education/training programs specifically designed to enhance entrepreneurial skills for healthcare professionals.

15. Please, provide details or examples.

Developing some skills out of our education is the best. For example, some business model/plan and risk management training.	**Escola Nacional de Saúde Pública - Universidade Nova de Lisboa - Curso de Administrador Hospitalar**	**Idays, beyond accelerator, Cyprus seeds**
	PADIS - Programa Alta Direção Instituições de Saúde - AESE	Restless programme which is being held by the University of Silesia. I have not yet participated in it but I'm looking forward to doing so.
EIT Health	**HL7 Courses/Exams, Connectathons etc**	

Figure 14. Results of Question 15 Responses

Figure 15 reveals that despite being aware of education/training programs to enhance entrepreneurship in the healthcare sector, most respondents (61%) have not participated in such programs.

16. Have you participated in such programs?

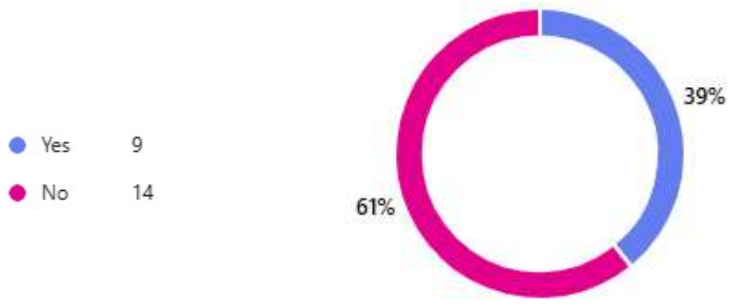

Figure 15. Results of Question 16 Responses

17. Please, provide details.

GUILD Academy Course	**PADIS - Senior Management Program for Healthcare Institutions (In Portuguese: *Programa Alta Direção Instituições de Saúde*)**	**Discipline of Entrepreneurship**
	AESE	

Figure 16. Results of Question 17 Responses

As displayed in Figure 17, 78,2% of the participants agree or totally agree that such education/training programs are valuable to foster entrepreneurship in the healthcare sector, with a mean score of 4,17.

18. Such educational and training programs are valuable in fostering entrepreneurship within the healthcare sector.

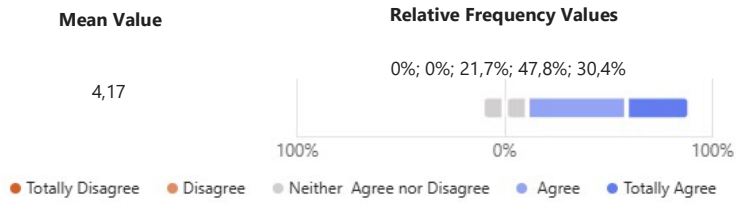

Figure 17. Results of Question 18 Responses

From all the mentioned pedagogical methods mentioned in question 19, which are considered important by most participants, engaging in real-world projects stands out since 91,10% of the participants agreed or totally agreed about its importance. This factor also presented the highest mean score of 4,71. The next two preferred pedagogical methods, considering the mean score values are using an experiential learning approach (4,44) and to work with and examine case studies (4,24). It can be inferred from these results that participants have a significant preference for practical and experimental activities.

*19. In my opinion, the following **pedagogical methods** are very important for me to learn*

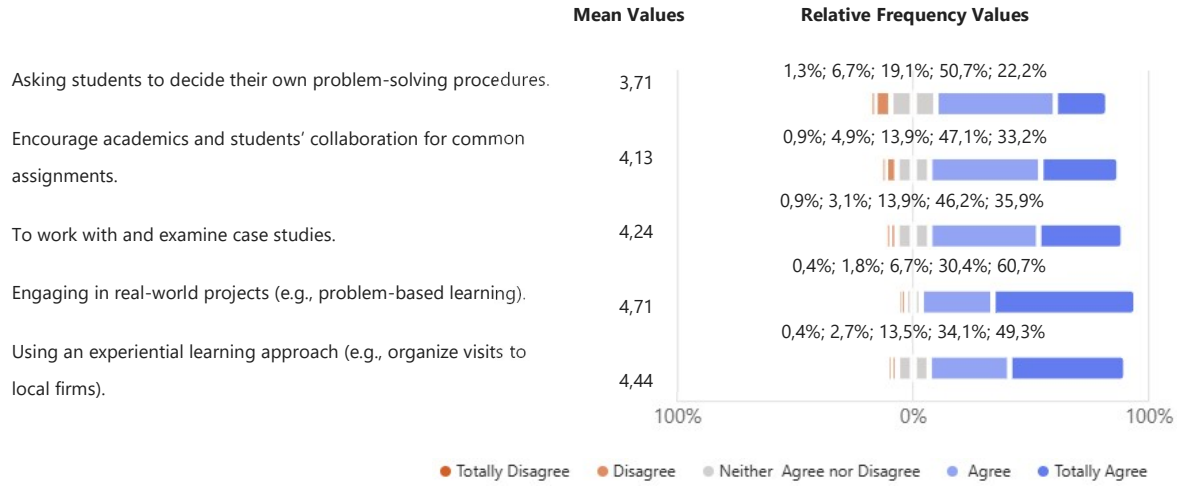

Figure 18. Results of Question 19 Responses

Results of question 20 allow to identify the preferred resources/support to encourage students to explore entrepreneurial opportunities in the healthcare sector. Funding opportunities and mentorship programs have the two highest relative frequency values of agree and totally agree answers, 86,10% and 84,80% respectively, and the two highest mean values of 4,48 and 4,35, respectively.

*20. I believe the following **resources/support** encourage students/graduates to explore entrepreneurial opportunities in the healthcare sector*

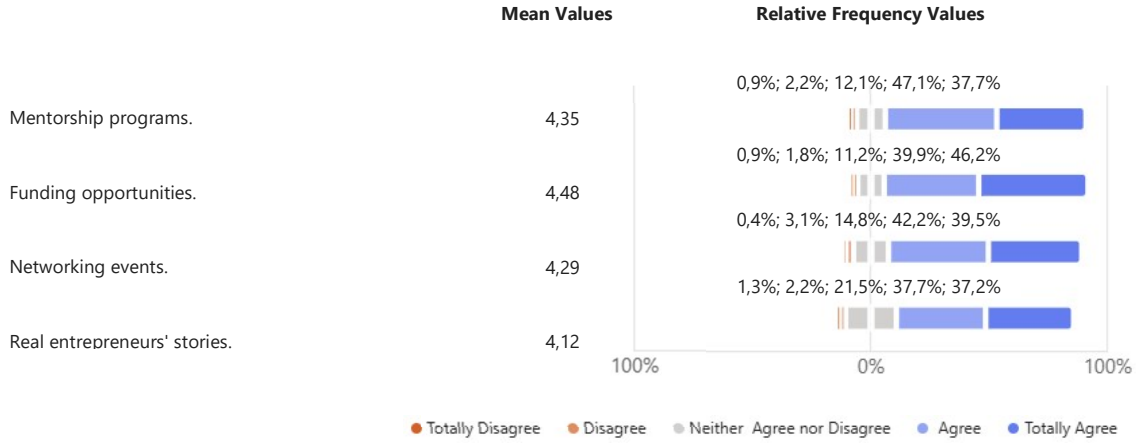

Figure 19. Results of Question 20 Responses

The answers to question 21 accentuate the importance of provide mentorship programs and visits to successful companies and knowledge about funding is pointed as critical. Lectures and events to share knowledge on how to plan businesses and finances is also pointed out by one of the respondents as important resources. Understanding health market regulation, namely the Medical Device Regulation 2017/745 is an additional resource not contemplated in the previous questions, but that is, according to one respondent, mandatory for anyone who wants to become an entrepreneur in this area.

21. If there are other resources/support that you find important, please explain.

Portugal – "Although already mentioned above, I believe that **Mentoring Programs** are crucial to empower healthcare entrepreneurship mindset. Sometimes students may feel they have a different idea, something that could become a new business, but don't know or don't own the resources to develop that idea into a profitable business. For that, mentoring programs and of curse some **funding would be critical** to learn how to develop that, which path to follow and what to achieve to become profitable."

Germany – "Lectures / information events / workshops on how to properly plan **financing** and set up a **business plan** which will gain the trust of potential investors."

Portugal – "Regarding digital health (you mention apps but you could also mention its super-category Medical Devices), you seem to miss the most obvious piece of regulation that really (I mean really really really) impacts the work of a healthcare entrepreneur, the **Medical Device Regulation 2017/745**. You cannot be in this area if you don't understand how this market is regulated. And any entrepreneur in this area will, at some point, be faced with 2017/745, either from a usage or from a developer perspective (among others). You would do well in considering this."

Greece – "Self-pace learning through internet"

Poland – "Physical/Virtual **visits to companies** that are excelling in this sector"

Greece – "Summer Camps"

Figure 20. Results of Question 21 Responses

4.4. Delivery mode (Question 22)

According to Figure 21, the mode of delivery with the highest relative frequency of “agree” and “totally agree” answers was in-person (face-to-face), corresponding to 73,6%. The second preferred mode of delivery is Hybrid (mixture of online and face-to-face), with a relative frequency of “agree” and “totally agree” answers of 72,4%. The two highest mean scores also corresponded to in-person (4,02) and hybrid (3,88) modes of delivery.

22. If I were to attend an entrepreneurship training course for healthcare students/graduates, I would prefer it to have the following ***modes of delivery***

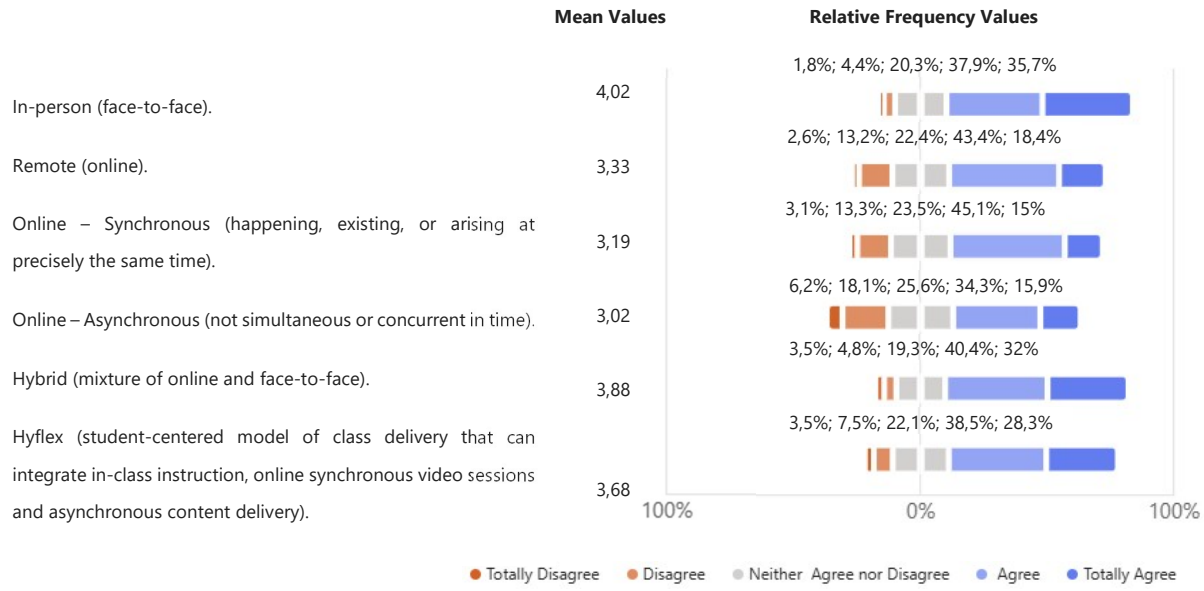

Figure 21. Results of Question 22 Responses

4.5. Assessment and certification (Questions 23 and 24)

According to the results exhibited in Figure 22, the preferred methods of assessment, considering the relative frequency values of “agree” and “totally agree” answers in descending order are laboratory work and follow-up lab reports (78,4%), group projects (77,9%), presentations (71,3%), tests with multiple choice questions (62,6%), essays and reports (58,4%), tests with open-ended questions (57,7%), and written exams (38%). Analysing the mean score values, it can be concluded that only laboratory work and follow-up lab reports, group projects, and presentations present a value higher than 3,5 (4,13; 4,05; and 3,60, respectively).

The results of question 24 revealed that participants preferred to receive a course certificate since this factor has both the highest sum of relative frequency of “agree” and “totally agree” answers (85,4) and mean value (4,52).

23. If I were to attend an entrepreneurship training course for healthcare students/graduates, I would prefer it to have the following ***methods of assessment***

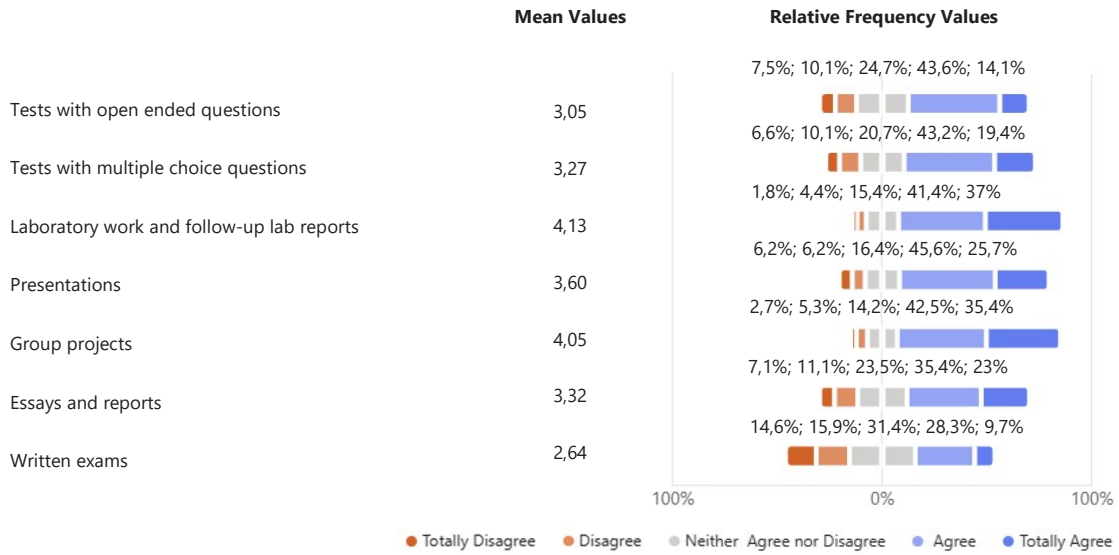

Figure 22. Results of Question 23 Responses

24. If I were to attend an entrepreneurship training course for healthcare students/graduates, I would prefer it to have the following ***certifications***

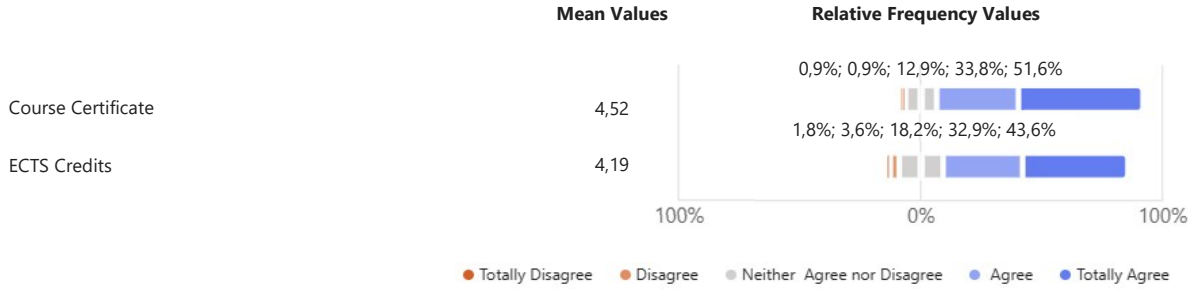

Figure 23. Results of Question 24 Responses

4.6. Respondent's information (Questions 25 and 30)

The last section of the questionnaire presents information about the respondents. As it can be verified in Figure 24, the highest percentage of respondents are engineering students or graduates and according to Figure 25, most respondents (65%) are students.

25. Academic area

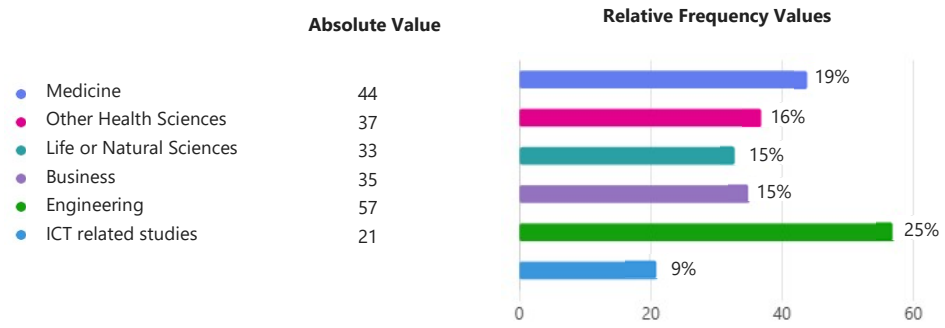

Figure 24. Results of Question 25 Responses

26. Academic status

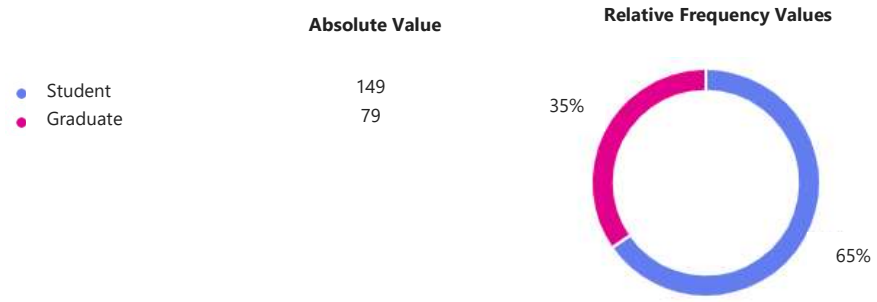

Figure 25. Results of Question 26 Responses

As displayed in Figure 26, most respondents are undergraduates or have a bachelor's degree, corresponding to 52% of the participants.

27. Level of education

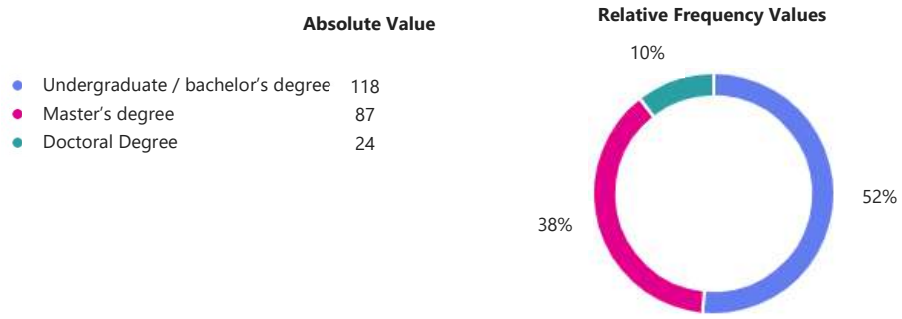

Figure 26. Results of Question 27 Responses

This questionnaire compiles responses from participants from 5 different countries, being the biggest percentage of them from Poland (24%), conforming to Figure 27, and 55% of the respondents are women (Figure 28).

28. Country

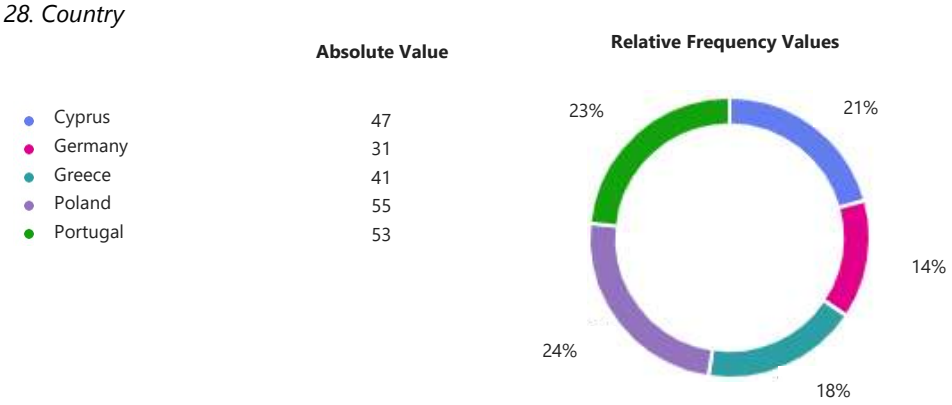

Figure 27. Results of Question 28 Responses

29. Gender

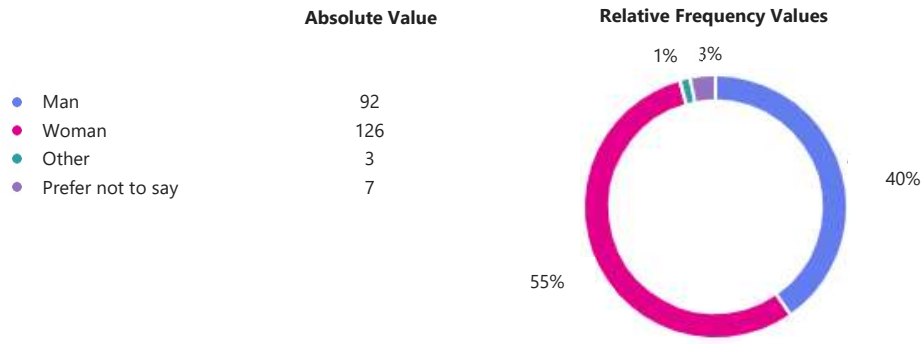

Figure 28. Results of Question 29 Responses

The minimum value of age of the participants in the questionnaire was of 18, with a total of 210 responses. The results of question 30, exhibited in Figure 29, reveal that 37,14% of the respondents were between 21 and 24 years old. The participation of students who are 20 or less years old was also significant (19,52%) as well as the participation of students or graduates with ages ranging from 26 to 30 (19,52%).

30. Age

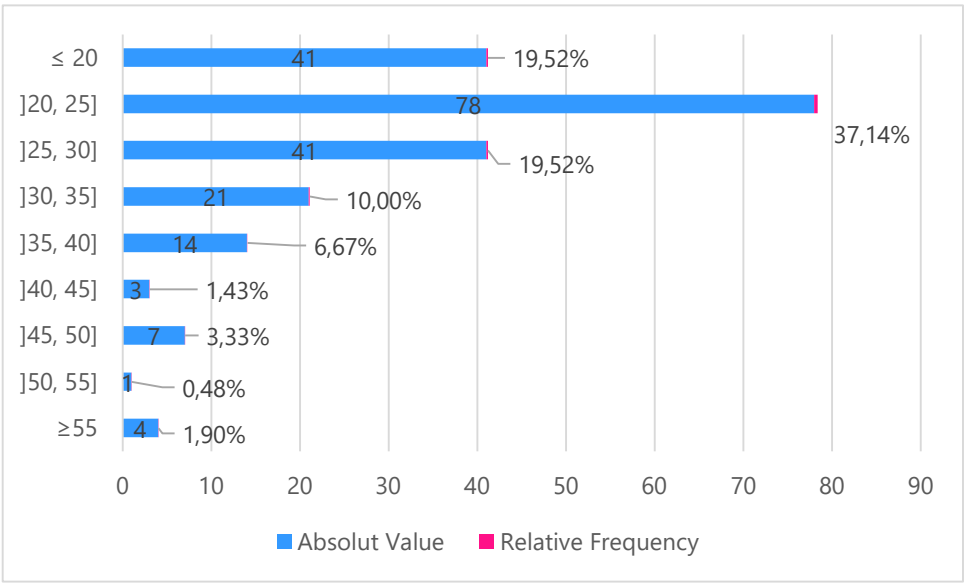

Figure 29. Results of Question 29 Responses

4.7. Summary of Responses

The results of the questionnaire regarding the most important skills and competencies, pedagogical methods, resources/support, delivery mode, assessment and certification are summarised in Table 1. In this table, were included only the factors with a sum of relative frequency of “agree” and “totally agree” responses higher than 50% and with a mean score value of the 5-point Likert scale higher than 3,5. The exhibited factors of each question are ordered from the highest mean score value to the lowest.

Table 1. Summary of Questionnaire Responses

Theme	Subtheme	Key Factors	Mean Score
Skills and Competencies	**Analysing Information (Question 3)**	Combining business information from different sources.	4,59
		Evaluating usefulness of resources.	4,57
		Recognizing new opportunities.	4,5
	Managing and Planning (Question 4)	Identifying appropriate business strategies.	4,66
		Developing an action plan which includes the basic steps to achieve the goals of my activity/idea (e.g., setting milestones).	4,54
		Evaluating the outcomes of work.	4,51
		Developing a business plan describing how to achieve the goals of my business.	4,48
		Determining logistics for manufacture/delivery of products.	4,32
	Sales, Financing, and Contracting (Question 5)	Negotiating contracts.	4,52
		Drawing up and managing budgets.	4,48
		Raising funds.	4,41
		Setting prices.	4,23
		Selling techniques.	4,05
	Working with People (Question 6)	Developing motivated teams of people.	4,59
		Identifying my strengths and weaknesses and those of my team.	4,58
		Managing stress and obtaining balance.	4,52
		Managing conflict.	4,51
		Empowering others and delegating work as appropriate.	4,47
	Dealing with risk and ambiguity (Question 7)	Taking bold and high-impact actions to achieve the company's objectives.	3,77

Achievement (Question 8)	Learning as much as possible from my business.	4,52
	When doing something, doing it with excellence.	4,22
	Deriving a sense of achievement and satisfaction from my work.	4,05
Innovativeness (Question 9)	Always searching new and better ways of doing things.	4,43
	Changing the way things are done.	3,75
	Coming up with new, wild, or even crazy ideas.	3,55
Dynamism (Question 10)	Being the first to introduce new products/services, management techniques, operating technologies, etc.	3,83
	Initiating actions to which competitors respond instead of responding to actions initiated by competitors.	3,81
Autonomy (Question 11)	Making things happen instead of waiting and watching things happen.	4,35
	Accepting both positive and negative consequences of my decisions and actions.	4,34
	Depending on my efforts to influence the outcome of events in my life.	3,77
Self-confidence (Question 12)	Having the ability to cope under new, untested conditions.	4,25
	Accomplishing under no direct supervision of anyone.	3,62
	Asserting myself against the opinion of the majority.	3,59
Digital Skills (Question 13)	Cybersecurity Awareness in Health IT - sensitive health data against breaches, ensuring patient trust and regulatory compliance.	4,39
	Electronic Health Record (EHR) Management - efficiently and securely managing patient data and enhancing care quality and coordination.	4,36
	Digital Imaging and Diagnostic Technologies - advancing diagnostic precision and supporting remote analysis capabilities.	4,33
	Mobile Health (mHealth) App Development - creating accessible health applications, supporting self-management, and patient engagement.	4,30
	Health Data Privacy and Compliance - ensuring data protection, privacy, and adherence to health regulations.	4,23
	Health Information Exchange (HIE) - demand sharing of health information across platforms, improving patient outcomes and care continuity.	4,21

		Interoperability of Health Systems - integrating diverse health IT systems, facilitating comprehensive care delivery.	4,17
		Telehealth Technology Competence - providing accessible care remotely, particularly important in expanding healthcare reach.	4,16
Learning Activities	**Pedagogical Methods (Question 19)**	Engaging in real-world projects (e.g., problem-based learning).	4,71
		Using an experiential learning approach (e.g., organize visits to local firms).	4,44
		To work with and examine case studies.	4,24
		Encourage academics and students' collaboration for common assignments.	4,13
		Asking students to decide their own problem-solving procedures.	3,71
	Resources/ Support (Questions 20 and 21)	Funding opportunities.	4,48
		Mentorship programs.	4,35
		Networking events.	4,29
		Real entrepreneurs' stories.	4,12
		Other Resources/support (Open Answer): • Entrepreneurship in the healthcare sector • New and profitable business • Planning • Medical Devices and regulation	-
	Delivery Mode (Question 22)	In-person (face-to-face).	4,02
		Hybrid (mixture of online and face-to-face).	3,88
		Hyflex (student-centred model of class delivery that can integrate in-class instruction, online synchronous video sessions and asynchronous content delivery).	3,68
Assessment and Certification	**Assessment (Question 23)**	Laboratory work and follow-up lab reports	4,13
		Group projects	4,05
		Presentations	3,60
	Certifications (Question 24)	Course Certificate	4,52
		ECTS Credits	4,19

Questionnaire results point out to important skills and competencies. Considering the mean score value of each category of skills, obtained by summing the mean scores from each key factor and dividing the result by the number of key factors, the skills in increasing order of importance are the following:

- Analysing Information (Question 3) – 4,55
- Working with people (Question 6) – 4,53
- Managing and Planning (Question 4) – 4,50
- Sales, financing, and contracting (Question 5) – 4,34
- Digital Skills (Question 13) – 4,27
- Achievement (Question 8) – 4,26
- Autonomy (Question 11) – 4,15
- Innovativeness (Question 9) – 3,91
- Self-confidence (Question 12) – 3,82
- Dynamism (Question 10) – 3,57
- Dealing with risk and ambiguity (Question 7) – 3,46

According to the mean score values analysis, it also can be concluded that participants prefer to develop their entrepreneurial skills with real-world projects and follow an experimental approach. Having support for funding opportunities and mentorship programs are also useful resources to create a business in the healthcare sector. Participants mostly prefer to have lessons in person and, regarding evaluation, they would rather be evaluated through laboratory work and group and value getting a course certificate more than receiving ECTS. This information, together with the results of best practices research and focus group sessions, provides useful insights for designing a pedagogical framework as presented in the next section.

5. Proposal of a Framework

In order to develop a significant framework, the best practices, the data collected from the focus group and the questionnaires were carefully analysed and crossed with the modules initially proposed in the application. The initial idea was that each partner would prepare the content of at least two modules, whose topics (indicative) could be business plan development, market analysis and identification of healthcare needs and trends, stakeholder identification and engagement, go-to-market strategies, financial management of startups, industry-related leadership skills and industry-related digital and green skills. Meanwhile from the best practices collected (cases of innovative startups or business ideas, incubators or accelerators, entrepreneurship programmes and courses), it was possible to see that there is growing concern and interest in fostering entrepreneurship in healthcare tech industry. Reports of best practices often emphasised the importance of promoting collaboration between industry and academia, providing mentorship and adequate physical infrastructures, adopting a co-creative approach, creating contests to reward the best business ideas, and foster entrepreneurial mindset and soft skills. The inputs of the focus group were of great relevance. Some training topics for the RESTLESS course were suggested: funding and financial management, business planning, market analysis, regulatory landscape in healthcare, digital health technologies, ethics, leadership and team management, design thinking, project management and soft skills (resilience, effective communication and leadership). One question raised was that not only success should be presented, making the students reflect about the problems and failures. The mobility experiences and immersion in the company were also suggested. It was also highlighted the implementation of innovative pedagogical methods, such as product-based learning, case-based learning, and flipped classrooms. According to focus group results it would be enriching to facilitate networking opportunities between students and entrepreneurs, include internships in the training offer, promote work in multidisciplinary teams/projects and to allow curricula flexibility. The questionnaire results were very clear pointing to the need of improve all general skills and competences presented (information analysis, managing and planning, sales and financing, working with people, achievement, innovativeness, autonomy, self-confidence) as well as the digital skills. From the pedagogical methods, the respondents would better prefer engaging in real-world projects (e.g., problem-based learning), they would like to have as support more funding opportunities and mentorship. They would prefer face-to-face courses and be evaluated by laboratory work and reports. Having a certificate or ECTS at the end would be also appreciated.

Having in mind what was initially defined in the proposal, the data collected regarding best practices, focus group opinions, results of questionnaires from students/graduates and a brainstorming exercise carried out with the partners of the project, a framework proposal is presented (see Figure 30).

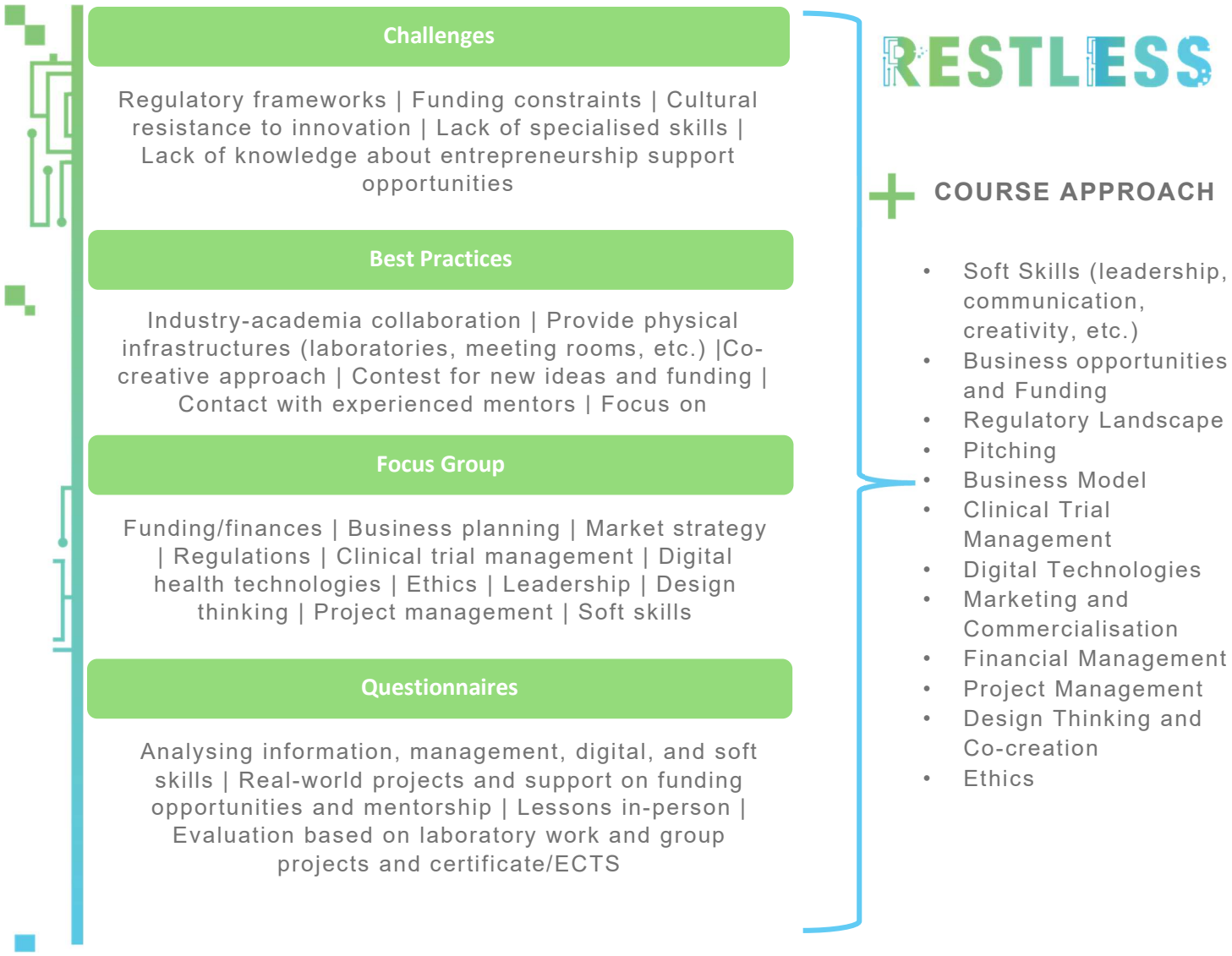

Figure 30. Framework Proposal

6. Conclusion

This document reports the results from WP2 activities aiming to collect insights from some organisations or training programs (through best practices collection), entrepreneurs, career advisors, and professors of entrepreneurship (through focus group sessions), and students or graduates as potential entrepreneurs in the healthcare sector (through questionnaires). The collected information constitutes useful insights for designing an educational framework for a training program to empower students and graduates to become entrepreneurs in the fast-evolving healthcare sector.

The main conclusions of this report can be summarised in the following main topics:

1. **Current Trends:**
   - Digital transformation for data processing, development of applications to improve healthcare services and organisational management
   - Artificial intelligence for enhanced personalised medicine
   - Patient-centred approach allowing enhanced residential care services and remote patient monitoring
   - Blockchain is a highly disruptive trend, despite not being implemented.
   - Interoperability
   - Preventive Medicine
   - Cross-fertilization Between Clusters
   - Ultrasound-based medical solutions
   - Robotic applications

2. **Challenges to be Addressed:**
   - Complexity of Regulation and Certification and Slowness in responding to market needs
   - Need for specialised entrepreneurial skills
   - Population with greater literacy, and consequently more demanding
   - Resistance to Innovation
   - Personal Circumstances of Potential Entrepreneurs and lack of knowledge on available support to start a business
   - Improve management, especially in hospital environment

3. **Demanded Skills**
   - Work experience
   - Soft skills, namely adaptability, self-efficacy, spontaneity, leading with failure, proactivity. Communication, teamwork, critical thinking, curiosity, empathy, resilience, leadership, cultural knowledge, ability to work in international teams, and interpersonal skills.
   - Technical skills related to regulatory acumen, data processing, immersive technologies, digital technologies, clinical trial management, medical certification process, quality management, project management, financial management, and business planning.

4. **Pedagogical Approaches:**
    - Applying pedagogical innovation processes such as product-based learning, case-based learning, and flipped classrooms
    - Contact and Collaboration between academia and industry
    - Practical experiences, allowing experimentation, analysis of successful and non-successful case studies, and work in projects
    - Include Curricular internships in the training offer and provide mobility experiences
    - Flexibility of Curricula
    - Co-creative process to develop new solutions
    - Provide the needed physical infrastructure for developing a business and knowledge transfer (laboratories, meeting rooms, etc.)
    - Follow a discussion-based style

5. **Modules of the Training Programme:**
    - Soft Skills (leadership, communication, creativity, etc.)
    - Business Opportunities and funding
    - Regulatory Landscape
    - Pitching
    - Business Model
    - Clinical Trial Management
    - Digital Technologies
    - Marketing and Commercialisation
    - Financial Management
    - Project Management
    - Design Thinking and Co-creation
    - Ethics

6. **Mode of Delivery**: In-person.

7. **Assessment and Certification:**
    - Laboratory work
    - Group projects
    - Course certificate (preferentially) or ECTS

The results from this report will contribute to creating a training programme tailored to current trends and challenges of the healthcare industry, while following potential participants' preferences. These conclusions will be considered in the development of the RESTLESS Training Programme, corresponding to WP3.

Annex I – Best Practices Results

3AHealth (CY)

3AHealth is an healthcare technology company, that exemplifies best practices in the healthcare technology sector in Cyprus, through its commitment to innovation, standards adherence, and impactful project execution. The following best practices can be highlighted:

- Focus on user-centric design, agile development methodologies, and strategic partnerships with leading institutions.
- Software development for monitoring systems to support healthcare management.
- Involvement in projects related to secure and privacy-preserving indoor robotics solutions, fostering industry-academia collaboration, development of customised software solutions, and software integration for an integrated national eHealth ecosystem.

MammoCheck (CY)

MammoCheck company aims to enable women to be checked at home painlessly, easily, and quickly, without exposure to dangerous radiation. The analysis of this case allowed to identify the following best practices:

- Recognition of the critical role of technology in healthcare, the need for user-friendly solutions, and the importance of partnerships in driving innovation.
- Participation in competitions and programmes to refine technology and expand reach.

PURAITE (GE)

PURAITE is an early stage of development start-up project aiming to provide up-to-date medical research results in a reliable and user-friendly way to make it easier for everyone to access the latest scientific knowledge, aiming to save the considerable time and effort that is sometimes required to find and use the needed information. The following best practices stand out:

- Use of advanced Artificial Intelligence (AI) technologies based on principles of transparency and quality control to provide up-to-date medical research results.
- User-friendly approach.

MEDELIUM (GE)

MEDELIUM is a start-up company that deploys the Personal Health Train (PHT) concept for performing distributed data analytics tasks to address the federated learning. Data will remain in its original location, and analytical tasks will be sent to all participating intervention nodes. The following best practices can be highlighted:

- Development of a federated learning platform that guarantees high data protection standards regarding patient data, with federated and incremental learning being used and deployed within the project.

- Development of a platform with the ability to train models at scale across the different sites and without moving the data

JOIST Innovation Park (GR)

JOIST Innovation Park is the most recent venture of the Institute of Entrepreneurship Development conceived to enhance knowledge distribution, boost entrepreneurial spirit, establish collaborative networks, and offer inclusive working practices. Its best practices to support entrepreneurship in the healthcare sector are as follows:

- Providence of physical infrastructures such as coworking space, Conference, Meeting & Training Spaces, YouTube Room (for video and/or podcast production) in order to facilitate the establishment of collaborative networks and knowledge sharing.
- Promotion of "play and learn" activities using immersive technologies to boost entrepreneurial spirit.
- Focus on leveraging cutting-edge technologies to enable personalized medicine, informed decision-making, and enhanced disease prediction.
- Focus on improving employees' well-being and quality of life by equipping young workers with the necessary knowledge and practices regarding mindfulness.

Found.ation (GR)

Found.ation is an innovation management consulting firm, focused on leading transformations within teams and organisations. This company has as its best practices the following:

- Organisation of community Hackathons that allow to discover ideas that can be developed further into new products through prototyping
- Involvement in a project about the needed competencies for Digital Wellbeing and Digital Security.
- Involvement in a project focused on equipping women with digital skills while addressing a spectrum of psychological obstacles women are facing in the world market.
- Accelerator program, including financial support and business development support from top international experts.

Ubimedical (PT)

Ubimedical is a scientific complex aiming to ensure the needed conditions to develop businesses in the health sector. The following best practices can be underlined:

- Providing of laboratories and establishment of partnerships, which made possible to support the performance of essential clinical trials to develop new businesses.
- Appliance of a co-creative approach in learning processes, through sharing of practical knowledge from experienced entrepreneurs in the healthcare sector.

- Involvement in events with local institutions to share experiences and opportunities concerning entrepreneurship in the healthcare sector.
- Dissemination of several contests contributing to the generation of new business ideas and providing financial support for their development to share experiences, career opportunities and academic training for entrepreneurship in the healthcare sector.
- Promotion of the involvement of students from University of Beira Interior of several courses in workshops and competitions to strengthen their entrepreneurial skills.
- Partnership with the Re-UNITA project, a European network collaboration that promotes brain circulation and infrastructures' sharing between six European universities enhancing cooperation between academic and non-academic actors to foster the socioeconomic development of mountain regions.

BIO-ALL (PT)

BIO-ALL is a project focused on promoting collaborative dynamics between the different academic and non-academic stakeholders. The analysis of this case allowed to identify the following best practices:

- Organisation of events based on a multidisciplinary approach and participant-driven strategy.
- Events planned to share the perspective of specialists on new trends and challenges in the BIOHEALTH sector, their successful experiences on health entrepreneurship and innovation fostering.
- International Joint Post-Graduation and International Joint Accelerator Program were previously tested by students and seed-stage companies.
- Publishing of a roadmap with possible evolution scenarios, related strategies, actions, and lessons learnt to encourage entrepreneurial and innovative processes in the BIOHEALTH sector, which was developed with the active participation of key-actors and end-users.
- Creation of the pioneering International Joint Post-Graduation, designed to bridge the gap between the offer of university curricula and the skills required by the business world and promote the contact with entrepreneurial/innovation-driven processes and collaborative practices.
- Creation of Gear Box Business Accelerator program to reward innovative ideas with a monetary prize and consultancy to companies in the seed stage.
- Updating and maintenance of a collaborative online hub to inspire, encourage and support open innovation activities and co-creation processes.

Entrepreneurship Module under the "New Concept of Studies" (PL)

The "New Concept of Studies" is a horizontal action in all learning programs across the University of Silesia in Katowice to encourage students to gain some knowledge/skills from outside their main discipline. This approach allowed students from different areas, such as

students from biology, sociology, etc., to develop entrepreneurship skills. From this initiative, the following practices stand out:

- Provide the opportunity to all students to enhance their conscientisation about modern changes, covering areas such as the digital world, creative expression and critical thinking, limits of science, health and personal development, environment and technologies, and civil society and entrepreneurship.
- Organising classes with students from multiple areas of knowledge, turning discussions and exercises more engaging.
- In the Civil Society and Entrepreneurship module:
    - Encouraging students to develop a creative attitude towards reality
    - Equip students with abilities to independently create a business, bearing in mind inherent organisational and legal conditions, and identify opportunities and threats.
    - Teaching about design thinking methodology and entrepreneurial mindset.

‘Hook for Health’ Event (PL)

The ‘Hook for Health’ event is a design and training contest, where participants from different industries, working in interdisciplinary teams and under the guidance of mentors from the medical and technology industry, create innovative solutions to a pressing social problem within a limited timeframe. From the analysis of this case, the following practices can be highlighted:

- Promotion of events that privilege the share of experience, expertise, and knowledge from experienced mentors from the medical, technology and business sectors.
- Promotion of events that allow the establishment of business contacts in the academic community.
- Designing events that consider benefits to both contest participants and companies. The event provided financial prizes and awards for the best projects, while allowing companies and business partners to identify new partnership opportunities with universities and have access to the talent pool.

Annex II – Focus Group Results

Theme	Sub-theme	Key Insights
Current Trends	Digital Transformation	• The use of the Cloud allows data processing to be processed quickly, reliably, and more securely [#PT, #GR] • Application development and Software for hospital organisation [#PT, #GR] • Delay in the adoption and uptake of digital technologies [#GE] • Exaggerations with data protection [#GE] • Though there are positive signals e.g., in the field of DiGAs – the digital Applications that Germany appears as able to lead the field [#GE] • Avoid investing only in lifestyle Health Apps but seize the opportunity to invest in deep techs in the sector, following an acting "outside-the-box" mindset [#GE] • Augmented Reality technologies for medical training and hospital management software [#GR]
	Artificial Intelligence	• Early implementation phase [#PT, #GR, #PL] • Applications to enhance personalised medicine, for example, at the level of diagnosis [#PT] • Hardware monitoring using Artificial Intelligence [#PT]
	Patient-Centred Approach	• Treatment-centred approach and approach to healthcare [#PT] • Enhanced residential care services catering to both elderly and adult populations [#CY] • Personalised medicine and remote patient monitoring (e.g., telemedicine and electronic health records) [#CY, #PL]
	Others	• Blockchain is one of the trends identified as highly disruptive, but it is not yet in the implementation phase [#PT, #GR] • Interoperability is highly implemented, albeit with different degrees of maturity, and its development will continue to be a trend [#PT, #GR] • Increased funding opportunities [#PT, #GR] • Preventive Medicine: Focus on prevention to avoid overloads on health services [#PT, #GR] • Personalised medicine [#PL] • Cross-fertilization Between Clusters: The health sector tends to work in an ecosystem with other sectors and other areas of knowledge [#PT] • Professional medical solutions related to ultrasound [#PL] • Robotic applications, not only surgical but solutions such as punctures and mechatronics [#PL]
Challenges	Regulation and Certification	• Complexity associated with combining Software as a Medical Device with Artificial Intelligence [#PT, #GR] • Slowness in responding to market needs [#PT, #GR] • Navigating intricate regulatory frameworks poses barriers to innovation and business growth [#CY] • Getting the required certification [#PL] • Reversed certification process (used to be EU certification first, FDA certification later) [#PL]

	Entrepreneurship Skills and Literacy	• Need for specialised skills such as regulatory expertise, clinical trial management, and health economics [#CY] • Need for skills development for immersive technology applications, such as virtual reality for patient rehabilitation and medical training [#GR] • Population with greater literacy, posing new challenges to the health sector [#PT] • Investment in educating people (students, researchers, entrepreneurs, etc.) on acquiring transdisciplinary collaboration skills [#GE] • Teach (and learn) to act/move and make decisions under uncertainty [#GE] • Separate the fad between what currently attracts attention from what is meaningful and can equip the students with substance [#GE] • 'Design thinking is an excellent approach – how one employs it into their action planning and transforms it into a business roadmap is a different one' [#GE] • 'Business model canvas literacy is not what will make someone successful' [#GE]
	Resistance to Innovation	• Cultural resistance within established healthcare practices to adopting new technologies and methodologies [#CY] • Convincing the market and customers of the value of an innovative solution [#PL]
	Personal Circumstances of Potential Entrepreneurs	• University students' lack of knowledge about opportunities to support entrepreneurship [#PT] • In addition to internal (e.g., skills) and external (e.g., economic situation, university, company environment) factors, personal circumstances, including mental health, influence the ability to become an entrepreneur [#PT, #GR]
	Others	• Securing initial capital remains a significant hurdle for healthcare entrepreneurs [#CY] • Restricting patient access to the latest technology [#PL] • Continual raising of the market entry threshold in terms of costs and duration associated with certification are also relevant challenges [#PL] • Need to improve management, particularly in a hospital environment [#PT] • Growing population ageing [#PT, #GR] • Lack of collaboration between students from different courses that could lead to innovative business ideas by adding sharing perspectives from different areas of knowledge [#PT, #GR]
Demanded Skills	Work Experience	• Having work experience before starting your training specialization can be an advantage [#PT]
	Soft Skills and Mindset	• Ability to adapt and willingness to learn [#PT] • The profile of a student with a high degree of employability is characterized by a high degree of self-efficacy, adaptability to the job market, and the need to have a career. [#PT] • Spontaneity enhanced by participation in artistic activities [#PT] • Accept the error and the "no" [#PT] • Proactivity [#PT] • Communication, teamwork, and critical thinking [#GR]

		• Coming up with unexpected questions is important – in business one moves in an unmapped territory – and there is no solid ground that one walks into but rather quicksand. [#GE] • Focus on understanding the users and their needs [#GE] • Strong communication skills are essential for conveying complex medical information to diverse audiences and fostering patient-provider relationships [#CY] • Resilience is fundamental for coping with challenges such as regulatory hurdles and funding uncertainties [#CY] • Leadership Abilities for guiding multidisciplinary teams towards achieving healthcare innovation goals [#CY] • Cooperation in Polish, European and international teams [#PL] • Knowledge of cultural differences among team members [#PL]
	Technical Skills	• Regulatory Acumen to understand and comply with local and international healthcare regulations to ensure product safety and market entry [#CY] • Skills related to data processing [#PT, #GR] and expertise in immersive technologies, such as virtual reality and augmented reality [#GR] • Proficiency in digital health technologies, data analytics, and clinical research methodologies [#CY] • Skills and knowledge regarding medical certification processes and quality management systems for medical designers and manufacturers [#PL] • Production quality management according to EU and US certification guidelines (ISO 13485, specifically for medical devices) [#PL] • Project management (including methodologies, tools and resources for conducting projects) and leadership [#PL]
Importance of Training to Business Creation	Interpersonal and Entrepreneurial Skills	• Interpersonal skills courses can promote the development of soft skills important for business creation [#PT] • Training can impart essential skills such as business planning, financial management, and market analysis [#CY] • Training can facilitate regulatory compliance: by providing insights into navigating regulatory landscapes and ensuring adherence to healthcare standards [#CY] • Strengthen team management from a leader's perspective and build self-awareness of leaders [#PL] • Empower organisations with knowledge on how to build relationships with colleagues and the company's external and internal environment [#PL]
	Fostering Innovation	• Applying pedagogical innovation processes such as product-based learning, case-based learning, and flipped classrooms can promote the development of entrepreneurial skills [#PT] • Training programmes promoting a supportive ecosystem that encourages experimentation and the development of novel healthcare solutions [#CY]
	Contact and Collaboration	• Include testimonials from former students and/or industry professionals in teaching [#PT] • Facilitate networking opportunities between healthcare professionals, researchers, and entrepreneurs can foster collaborations essential for success [#CY]

	Practical Experiences	• Include curricular internships in the training offer [#PT, #GR] • Include practical activities in the classroom context that promote the development of transversal skills [#PT] • The best way to train for business creation is to let students work on projects [#GE] • When promoting practical experiences, there is no need to teach the approach “fake it till you make it” since it can promote imposter syndrome and make people still feel like they fake something, even after they have proven that they don’t at all [#GE]
	Multidisciplinary	• Create entrepreneurship subjects with students from different courses to promote the sharing of different perspectives and knowledge [#PT] • Promote the creation of multidisciplinary theses/dissertations, that is, in partnership with different faculties (engineering, health, social and human sciences, etc.) [#PT]
	Others	• Cro-creation process: Partnership between academia and relevant market players to develop new solutions [#PT] • Lifelong Learning Perspective: Continuous training based on the needs identified in the professional path [#PT] • Flexibility of curricula that allows the development of skills according to the student's profile [#PT] • Project Management: how to develop a project and prepare the next steps (certification, implementation, etc.) and how to manage a project budget [#PL] • Raising Money: learn how to effectively look for and raise money to develop a start-up and Prepare investment pitches [#PL] • Incorporate virtual reality and augmented reality applications [#GR]
Important Training Topics	Funding and Financial Management	• Basic knowledge of financial management to know how to monetise ideas [#PT, #GE] • Teach Financial Literacy through the analysis of case studies, sharing with the student a clear vision of the practicality of the content [#PT] • Include sessions on securing investment, financial forecasting, budgeting, and revenue model development [#CY]
	Business Planning and Strategy Development	• Cover aspects such as market analysis, competitive positioning, and sustainable growth strategies tailored to the healthcare sector [#CY]
	Regulatory Landscape in Healthcare	• Provide insights into navigating local and international regulations governing healthcare products and services [#CY]
	Clinical Trial Management	• Understand the process of designing, conducting, and managing clinical trials to ensure compliance and efficacy [#CY]
	Digital Health Technologies	• Explore innovations in telemedicine, health apps, wearables, and their integration into healthcare delivery systems [#CY]

	Ethics and Patient Safety	• Ethics of business [#GE] • Address ethical considerations in healthcare innovation, patient privacy, and safety standards compliance [#CY]
	Others	• Leadership and team management [#PT], making students/participants aware of what the role of a leader is, the advantages and disadvantages of the role and preparing students for the role of a leader [#PL] • Design thinking [#GE] and co-creation [#PT] • Investment pitches, focusing on how to convince investors [#PL] • Project management [#PT] • Analyse not only success stories, but also promote the reflection on what went wrong to help increase collective learning curves [#GE] • Promote practical and mobility experiences. Provide the possibility of meeting companies already operating in the market and mobility experiences to learn about other work methodologies and develop a global mindset. [#PT] Encourage physical or virtual collaborations with professionals and students from other countries and cultures. [#GR] • Build courses that follow a discussion-based style, promoting the ability to communicate, listen to other people and read between the lines [#GE] • Modules focusing on soft skills such as resilience, effective communication, and leadership could complement technical training [#CY]

Annex III – Questionnaires

Link to the Online Questionnaire

Entrepreneurial healthcare students' training needs

Welcome to the **RESTLESS** - empowe**R**ing univ**E**rsity **S**tudents **T**hrough hea**L**th **E**ntrepreneur**S**hip training**S** Project Survey!

Your input is crucial as we seek to understand how to promote the of entrepreneurship education into some fields of study and to understand the skills, opportunities, and challenges in the healthcare sector from the perspective of students and graduates like you.

Thank you for your participation and insights!

Your consent

The survey is voluntary, completely anonymous and it will take about 7 minutes to complete. To help protect your confidentiality, the survey will not contain information that will personally identify you and the results of this survey will be used for the project's purposes only.

You can choose not to respond to any questions. Your participation or nonparticipation will not impact your relationship with the Research Team.

Submission of the survey will be interpreted as your informed consent to participate and that you affirm that you are at least 18 years of age.

If you have any questions about the research, please contact Arminda do Paço, via email at apaco@ubi.pt.

I have read the above information and agree to participate in this research project*

___Yes

___No

Entrepreneurial Intention

2. Regarding my entrepreneurial intentions:

	Totally Disagree	***Disagree***	***Neither Agree nor Disagree***	***Agree***	***Totally Agree***
I am considering becoming an entrepreneur in the healthcare industry.					
I associate entrepreneurship with lack of financial security.					
I associate entrepreneurship with the opportunity to realise myself and my dreams.					
I associate entrepreneurship with lack of work-life balance.					
I associate entrepreneurship with seizing opportunities that are not an option when being an employee.					
I associate entrepreneurship with a continuous exposure to failure.					
I associate entrepreneurship with being completely autonomous in my professional decisions.					
I am pretty sure that, sooner or later, I will be an entrepreneur in the healthcare industry.					

Skills and Competencies

Analysing Information

3. If I want to start my own business in the healthcare industry, it will be very important to

	Totally Disagree	***Disagree***	***Neither Agree nor Disagree***	***Agree***	***Totally Agree***
Recognizing new opportunities.					
Combining business information from different sources.					
Evaluating usefulness of resources.					

*receive training in the **analysing information** skills of*

Managing and planning

	Totally Disagree	***Disagree***	***Neither Agree nor Disagree***	***Agree***	***Totally Agree***
Identifying appropriate business strategies.					
Determining logistics for manufacture/delivery of products.					
Evaluating the outcomes of work.					
Developing an action plan which includes the basic steps to achieve the goals of my activity/idea (e.g., setting milestones).					
Developing a business plan describing how to achieve the goals of my business.					

*4. If I want to start my own business in the healthcare industry, it will be very important to receive training in the **managing and planning skills** of*

Sales, financing, and contracting

	Totally Disagree	***Disagree***	***Neither Agree nor Disagree***	***Agree***	***Totally Agree***
Selling techniques.					
Negotiating contracts.					
Evaluating the outcomes of work.					
Raising funds.					
Drawing up and managing budgets.					
Setting prices.					

*5. If I want to start my own business in the healthcare industry, it will be very important to receive training in the **sales, financing, and contracting** skills*

Working with people

	Totally Disagree	***Disagree***	***Neither Agree nor Disagree***	***Agree***	***Totally Agree***
Developing motivated teams of people.					
Empowering others and delegating work as appropriate.					
Managing conflict.					
Managing stress and obtaining balance.					
Identifying my strengths and weaknesses and those of my team.					

*6. If I want to start my own business in the healthcare industry, it will be very important to receive training in the **working with people** skills of*

Dealing with risk and ambiguity

*7. If I want to start my own business in the healthcare industry, it will be very important to receive training in **dealing with risk and ambiguity** skills of*

	Totally Disagree	***Disagree***	***Neither Agree nor Disagree***	***Agree***	***Totally Agree***
Having a strong preference for high-risk projects (with the possibility of very high but uncertain returns).					
Taking bold and high-impact actions to achieve the company's objectives.					
Adopting a bold and aggressive stance to make the most of potential opportunities.					

Achievement

8. If I want to start my own business in the healthcare industry, it will be very important to

	Totally Disagree	***Disagree***	***Neither Agree nor Disagree***	***Agree***	***Totally Agree***
Deriving a sense of achievement and satisfaction from my work.					
Learning as much as possible from my business.					
When doing something, doing it with excellence.					

*receive training in the **achievement** skills of*

Innovativeness

*9. If I want to start my own business in the healthcare industry, it will be very important to receive training in the **innovativeness** skills of*

	Totally Disagree	***Disagree***	***Neither Agree nor Disagree***	***Agree***	***Totally Agree***
Changing the way things are done.					
Always searching new and better ways of doing things.					
Coming up with new, wild, or even crazy ideas.					

Dynamism

*10. If I want to start my own business in the healthcare industry, it will be very important to receive training in the **dynamism** skills of*

	Totally Disagree	***Disagree***	***Neither Agree nor Disagree***	***Agree***	***Totally Agree***
Initiating actions to which competitors respond instead of responding to actions initiated by competitors.					
Being the first to introduce new products/services, management techniques, operating technologies, etc.					
Actively seeking to drive our competitors out of the market.					

Autonomy

*11. If I want to start my own business in the healthcare industry, it will be very important to receive training in the **autonomy** skills of*

	Totally Disagree	***Disagree***	***Neither Agree nor Disagree***	***Agree***	***Totally Agree***
Accepting both positive and negative consequences of my decisions and actions.					
Depending on my efforts to influence the outcome of events in my life.					
Making things happen instead of waiting and watching things happen.					

Self-confidence

*12. If I want to start my own business in the healthcare industry, it will be very important to receive training in the **self-confidence** skills of*

	Totally Disagree	***Disagree***	***Neither Agree nor Disagree***	***Agree***	***Totally Agree***
Accomplishing under no direct supervision of anyone.					
Having the ability to cope under new, untested conditions.					
Asserting myself against the opinion of the majority.					

Digital Skills

*13. If I want to start my own business in the healthcare industry, it will be very important to receive training in the **digital** skills of*

	Totally Disagree	*Disagree*	*Neither Agree nor Disagree*	*Agree*	*Totally Agree*
Electronic Health Record (EHR) Management - efficiently and securely managing patient data and enhancing care quality and coordination.					
Health Information Exchange (HIE)- demand sharing of health information across platforms, improving patient outcomes and care continuity.					
Telehealth Technology Competence - providing accessible care remotely, particularly important in expanding healthcare reach.					
Cybersecurity Awareness in Health IT -sensitive health data against breaches, ensuring patient trust and regulatory compliance.					
Mobile Health (mHealth) App Development - creating accessible health applications, supporting self-management, and patient engagement.					
Artificial Intelligence (AI) for Healthcare Solutions - enhancing diagnostics, treatment personalization, and operational efficiencies.					
Interoperability of Health Systems -integrating diverse health IT systems, facilitating comprehensive care delivery.					
Digital Imaging and DiagnosticTechnologies - advancing diagnostic precision and supporting remote analysis capabilities.					
Health Data Privacy and Compliance -ensuring data protection, privacy, and adherence to health regulations.					

Learning activities

14. Are you aware of educational and training programs specifically designed to enhance entrepreneurial skills for healthcare professionals?

___Yes

___ No

15. Please, provide details.

_____

16. Have you participated in such programs?

___Yes

___ No

17. Please, provide details.

_____

18. Such educational and training programs are valuable in fostering entrepreneurship within the healthcare sector.

___Totally Disagree

___ Disagree

___Neither Agree nor Disagree

___Agree

___Totally Agree

19. In my opinion, the following **pedagogical methods** are very important for me to learn

	Totally Disagree	***Disagree***	***Neither Agree nor Disagree***	***Agree***	***Totally Agree***
Asking students to decide their own problem-solving procedures.					
Encourage academics and students' collaboration for common assignments.					
To work with and examine case studies.					
Engaging in real-world projects (e.g., problem-based learning).					
Using an experiential learning approach (e.g., organize visits to local firms).					

*20. I believe the following **resources/support** encourage students/graduates to explore entrepreneurial opportunities in the healthcare sector*

	Totally Disagree	***Disagree***	***Neither Agree nor Disagree***	***Agree***	***Totally Agree***
Mentorship programs.					
Funding opportunities.					
To work with and examine case studies.					
Networking events.					
Real entrepreneurs' stories.					

If there are other resources/support that you find important, please explain.

_____

Delivery

22. If I were to attend an entrepreneurship training course for healthcare students/graduates, I would prefer it to have the following ***modes of delivery***

	Totally Disagree	***Disagree***	***Neither Agree nor Disagree***	***Agree***	***Totally Agree***
In-person (face-to-face).					
Remote (online).					
Online – Synchronous (happening, existing, or arising at precisely the same time).					
Online –Asynchronous (not simultaneous or concurrent in time).					
Hybrid (mixture of online and face-to-face).					
Hyflex (student-centred model of class delivery that can integrate in-class instruction, online synchronous video sessions and asynchronous content delivery).					

Assessment and Certification

23. If I were to attend an entrepreneurship training course for healthcare students/graduates, I would prefer it to have the following ***methods of assessment***

	Totally Disagree	***Disagree***	***Neither Agree nor Disagree***	***Agree***	***Totally Agree***
Tests with open ended questions					
Tests with multiple choice questions					
Laboratory work and follow-up lab reports					
Presentations					
Group projects					
Essays and reports					
Written exams					

24. If I were to attend an entrepreneurship training course for healthcare students/graduates, I would prefer it to have the following ***certifications***

	Totally Disagree	***Disagree***	***Neither Agree nor Disagree***	***Agree***	***Totally Agree***
Course Certificate					
ECTS credits					

Respondent's information

25. Academic Area

___Medicine
___Other Health Sciences
___Life or Natural Sciences
___Business
___Engineering
___ICT related studies

26. Academic Status

___Student
___Graduate

27. Level of Education

___Undergraduate / Bachelor Degree
___Master's degree
___Doctoral Degree

28. Country

___Cyprus
___Germany
___Greece
___Poland
___Portugal

29. Gender

___Man
___Woman
___Other
___Prefer not to say

30. Age

_____ *(Introduce a value higher than 18)*