



# ITECH

## Education and Training

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# CURRENT STATE



**Healthcare** is evolving fast and **medicine** has moved from the observational studies era to the molecular medicine era, to the precision medicine era and moves towards the **personalized / translational medicine era**.

**Scientific/technological enablers** of this evolutionary process are

- Imaging technologies
- Medical devices
- Molecular biology technologies (e.g. NGS)
- Nanomedicine
- eHealth
- Connected Health - behavioural informatics
- In-silico modelling of the human organs and systems (VPH).



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# VISION



## Translational Medicine calls for a high level of multidisciplinary

- ✿ An education & training pool of tools has to be developed and provided to all users and stakeholders involved in translational medicine and to the evolution of an idea to a marketable product in eHealth and MDDs enabling translational medicine services and practice such as clinical trials, interventions and DSS.
- ✿ It seems important for the idea to the market process to be successful that there is enough educational material for scientists, industry and product developers to learn the TRL model for the evaluation of the state of the product and the means to evolve successfully
- ✿ Provide educational material for ALL stakeholders involved in health delivery



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# WHAT



- ✿ There are (too) many gaps in a number of areas of eHealth, MDDs not covered through current **educational and standardization procedures**, from the undergraduate to the graduate, to the post-doc to the continuing education to the industrial / innovation to the health stakeholders to the citizens / patients levels.
  
- ✿ The explosion in scale refers to data sources such as
  - ✿ Hospital Information Systems, Public Health Authorities
  - ✿ Biomolecular data
  - ✿ Tele-Health: Tele-consultation, Tele-surveillance, Tele-medicine, Tele-surgery
  - ✿ Ambient Assisted living, Homecare
  - ✿ Mobile health, Connected Health
  - ✿ And new innovations...
  
- ✿ A number of issues to address in the educational arena
  - ✿ Information, data analytics
  - ✿ Semantics
  - ✿ Social networking
  - ✿ Heterogeneous sources of data and inter-regional and cross-country variability of health services ecosystem
  - ✿ Lack of self-management guidelines



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# WHY



**Enable multi-centric educational activities and advanced evaluation and conduct of clinical trials including big data analytics, association studies and medical hypothesis testing.**

This approach needs to encompass competencies from the following areas:

- Medicine & Biology
- Informatics, Smart Systems, Data management and analytics
- Psychology
- Human factors
- Pharmacology
- Behavioural, socio-economic sciences
- Public health

In this way we aim for **connected health, next generation systems medicine, systems biology, human factors, patient coaching and testing**. This would catalyse the adjustments needed at the current curricula levels as well as at the market and innovation levels.



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# HOW



Development of new courses as well as competencies (e.g. eHealth engineering, clinical trial design and evaluation, human factors, eHealth scientists, behavioural informatics)

Use EU tools such as MC or COST actions as well as good practices existing in the EU / US / Asia / Australia.

Courses should offer accreditation of competences and map specific knowledge to the different educational levels, in order to

- (a) Bridge the existing gap between the professionals getting out from universities to industry (e.g. the 10x10 US initiative in Biomedical Informatics);
- (b) Adopt an evidence – based approach (competencies - field)
- (c) Progress from mature knowledge to more “innovative” knowledge.



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# ACTIONS



**Continuous education should be offered at all levels and any university offering a Health Engineering course, should include a curriculum on Medical Devices and eHealth.**

**Set up a working group with representatives of the responsible actors to explore the possibility of a European curriculum based on eLearning or a MOOC, which will also offer accreditation for professional competence.**

**The European Commission, as well as professional organisations should be actively involved in the form of:**

- offering an EU curriculum on clinical trials and quality/safety enablers;
- Taking into account recommendations from EAMBES, IMIA. EFMI for the EU curriculum
- Using input from large scale NoEs and analogous networks to improve education
- Create a HUB with a pool of courses.
- Use platforms for wide educational possibilities such as the Google Scholar in collaboration with this HUB.



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# EXPECTED IMPACTS



- ❁ Common training in all aspects of the ‘idea-to-market’ process to support communication/ collaboration between researchers, developers, industrials and stakeholders, eventually bridging the existing gap between professionals getting out from universities to industry.
- ❁ Increase the likelihood of multi-disciplinary schemas with high added value at the innovation axis
- ❁ Increase patient and citizen empowerment
- ❁ Understanding the meaning of the TRLs from the industry and product developers
- ❁ To contribute to the economic growth by increasing the awareness of the public on the benefits of using eHealth and MDD in their daily life related to nutrition and medication
- ❁ This effort is expected to be a continuous process open to new ideas and new innovations, and developing an open EU Health Data Space.



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# Thank you for your attention

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