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On 9 July 2020, the CPME Executive Committee adopted the 'CPME response to the Digital Doc Thematic Network Survey on Challenges, Recommendations and Best Practices' (CPME 2020/060 FINAL).

CPME response to the Thematic Network on Digital Skills for Future Doctors (Digital Doc)
Survey on Challenges, Recommendations and Best Practices

Digital Skills for future-proof Doctors (Digital Doc)

Survey on Challenges, Recommendations and Best Practices

Thematic Network on Digital Skills for future-proof Doctors (Digital Doc)

SURVEY on CHALLENGES, RECOMMENDATIONS and BEST PRACTICES

New technologies are changing the role of doctors and the skills and competences they need. Although internationally many educational leaders and healthcare professionals recognize the need, these new skills and competences have not yet found their way into curricula of our medical students . Neither have they become part of the continuous professional development programmes offered to physicians throughout their career. Much needs to be done in this area of education and training, in order for healthcare professionals, systems and – not in the least – patients to fully benefit from these technological advancements.

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The joint statement of Digital Doc will focus on actions needed to be taken by the various stakeholders in order to integrate digital skills in the medical education. Our ultimate goal is to better prepare future and current doctors to cope with and contribute to the digital health care transformation.

Please fill in this survey to share your insights and experience on this topic. This way you can help us to identify challenges, to provide recommendations and to share best practices on the education of digital skills (both technical and relevant soft skills!) to medical students and doctors.

CHALLENGES - MEDICAL EDUCATION DIGITAL SKILLS

Do you foresee challenges to implement these new knowledge, skills, competences in medical education?

[Terminology note: the term 'competency' is divided into i) knowledge, ii) skills, and iii) attitudes]

Yes, since this is a transversal and interdisciplinary area.

The digital transformation of medicine should be understood by all actors as a long-lasting disruptive process of change and innovation that will massively modify the structures, processes and cultures of the healthcare system and thereby significantly alter the roles, competencies and cooperation of doctors and other healthcare professions.

The digital transformation of medicine and the resulting implications for medical are not yet understood by a significant number of relevant stakeholders. As a result, the necessary processes have not yet been initiated in many educational institutions. The stakeholder dialogue necessary for further development is currently not being conducted adequately. In this context, internal stakeholders are teachers, students and administrators, while external stakeholders are relevant partners who ensure a connection to the changing needs of the working environment. Promoting a wide acquisition of digital skills requires processes at various levels of the educational institutions: strategic processes by management, interdisciplinary processes by competence centres and individual promoters, technical processes by teachers.

What is/are the challenge(s) for medical student curricula? Please specify also **for whom** this is a challenge.

1500 character(s) maximum

Further developing medical practice through the introduction of digital health technologies is a complex process of change. In addition to investments in technologies, this requires a profound reflection in people's mentalities. Medical care is multifaceted and is provided by

people with deep-rooted personal, social and institutional beliefs and practices. In order to successfully develop medical practice in particular, the digital transformation must be understood by the medical profession as a long-lasting, disruptive process of change and innovation, which will massively change the roles and the necessary competencies and cooperation.

Digital transformation and increasing relevance of data in medicine require intensive training in data literacy. In this context, medical, technical, legal and ethical aspects have to be considered.

When developing these curricula, the high speed of the change process should also be taken into account and curricular adaptation in the sense of "agility by design" should be made possible right from the conception stage.

- For teachers:
  - to develop new high-quality programmes that keep up to speed with emerging technologies as it is an interdisciplinary field (IT, engineering, law, ethics, medical).

- For Universities:
  - to accept such new programmes by their own decision-making bodies and adapt medical training accordingly, with appropriate financial resources, while being duly recognised by national competent authorities;
  - to acquire funding for curriculum development, didactic qualifications and new equipment.

- For competent authorities:
  - to validate and certify high quality interdisciplinary programmes.

What is/are the challenge(s) for training programmes of current doctors?

Please specify also **for whom** this is a challenge.

1500 character(s) maximum

At present, neither the practising health professionals nor the generation in training are adequately prepared for the digital transformation of the health system. Further development in professional practice must take into account the changes brought about by digital transformation (increase in automated work, decentralised workplace, workforce with diverse qualifications. Patients and health professionals, as well as health system institutions, must be prepared to assume these new roles, tasks and functions.

- For CPD providers:
  - to develop new high-quality programmes that keep up to speed with emerging technologies;

- to invest in new digital technologies for hands-on sessions which could easily become obsolete.

- For physicians:
  - to be able to accommodate CPD and working hours;
  - motivation and openness to perceive digital solutions as important and useful for patients (physicians' mindset);
  - to believe in the ability of benefiting from digital solutions for the medical practice;
  - lack of financial support.

RECOMMENDATIONS - MEDICAL EDUCATION DIGITAL SKILLS

Do you have recommendations for specific stakeholders to overcome these challenges?

a. **Recommendations** with regard to education of medical students:

1500 character(s) maximum

Educational needs must be coordinated and structured to integrate digital literacy into medical school. The change from knowledge-based to process-based thinking must be taken into account. The necessary acquisition of competencies requires a fundamental and active examination of the core issues of the digital transformation and the superordinate skills.

Creating framework conditions in educational institutions
In order to enable the successful implementation of educational concepts, educational institutions should demand and create the organisational, personnel and financial measures and the necessary framework conditions. Policymakers must ensure that financial resources are made available and that equal access to the digital infrastructure is available throughout the country.

Promoting and recognising digital competencies for doctors
The acquisition of digital literacy of doctors should be made visible, promoted, recognised and incentivised.

Regulating the curricular implementation of digital competencies
The curricular implementation of digital competencies should be a constitutive component of future accreditation and certification frameworks for the initial, further and advanced training of doctors.

Developing curricula using agile methods
In the digital age, the high speed of change needs to be taken into account when developing curricula. Within the curricular framework, flexibility needs to be created to allow for

curricular adaptation. For quality assurance and accreditation, digital competencies should be reviewed.

Establishing professorships for digital medicine
In order to strengthen both teaching and research aspects of the digital transformation of medicine and the healthcare system, professorships with a corresponding profile should be established.

Creating digital spaces for experimentation and discourse
Virtual and real spaces for experimentation and discourse should be created in order to promote dialogue between all stakeholders of the education system of healthcare professions (learners, students, patients, relatives, teachers, curriculum developers, etc.).

Qualifying multipliers
Teachers should be prepared for their role in teaching digital competencies. This needs to be implemented in their own education, training, and continuous professional development.

Promoting the formation of a "community of practice"
Developing ecosystems is a purposeful measure to ensure co-innovation by different actors. Explicit and implicit knowledge is brought together and “out-of-the-box” thinking is actively supported. This makes it possible to drive innovation forward, transfer it into cross-institutional knowledge and make extensive use of it.

- For Universities:
  - Build a virtual network where medical students could follow lectures with known specialists/experts on new digital health techniques. This to exchange and disseminate knowledge faster. This network could be an extension of existing initiatives promoting student exchange;
  - Foster collaboration between university departments (IT, engineering, law, philosophy, medical), or create interdisciplinary departments, which are able to develop appropriate training in digital tools;
  - Provide theoretical knowledge and practical skills in the following areas:
    - telemedicine;
    - electronic health records and clinical decision support systems;
    - smart health devices and mHealth;
    - data analytics in healthcare;
    - genomics and bioinformatics;
    - augmented intelligence and neural networks;
    - ethical and legal implications of digital health tools;
    - communication skills with patients, relatives and healthcare team.
  - Include digital health aspects to existing clinical subjects.

b. **Recommendations** with regard to education of current population of doctors:

1500 character(s) maximum

- Organise relevant CPD on different areas/specialties to maintain and improve digital skills.

CHALLENGES – OTHER / CONTEXT

Do you foresee other challenges to create a context that empowers medical doctors to cope with and contribute to the digital health care transformation? If yes, what challenges and for whom?

1500 character(s) maximum

- For physicians:
  - Clear civil liability framework – definition of roles and tasks, particularly when using AI-systems;
  - Clear rules governing data uses / risk of misuse of data - digital format of health data makes it easier to manipulate, erase, disseminate, record, etc., and therefore increases risks of incorrect use;
  - Consider long-term impact on patient-doctor relationship, the employment setting and working conditions (e.g. feeling of surveillance, monitoring performance at work)
  - Continue to ensure medical confidentiality, data protection and privacy when using digital technologies
  - Increase interoperability and standards for IT systems and tools (e.g. a physician is constantly obliged to deal with different digital tools for recording/accessing patients' files. In the hospital setting and/or in private practice, the same patient has files in different systems, which renders the provision of healthcare more difficult, cumbersome and time consuming);
  - Costs of digital health transformation – receive sufficient funding to keep up with relevant digital technologies.

RECOMMENDATIONS – OTHER / CONTEXT

Do you have other recommendations, or do you think other actions are needed to create a context that empowers medical doctors to cope with and contribute to the digital health care transformation?

1500 character(s) maximum

- For physicians:
  - Existence of digital leaders capable of understanding the role of data, innovation and technology, having the energy and impetus to drive change.

- For policymakers:
  - Define appropriate financing models for digital health transformation;
  - Need to develop a specific register for IT professionals (e.g. in a professional chamber/council/association), who should abide to ethically-based codes of conduct and be subject to regulatory and/or disciplinary sanctions. This to foster trust in the usage of digital technologies.

- **BEST PRACTICE**

We aim to include a limited number of good examples in the Joint Statement. In case you are already involved in education on digital skills for medical students or doctors, please include the following information:

1. What is the goal / learning objective / the problem?

1500 character(s) maximum

"Medicine in the digital age "was the first curriculum, which addresses digital transformation and the changing qualification need for future doctors at a German medical school. It has been implemented since 2017.

The curriculum "Medicine in the Digital Age" explicitly pursues the approach of mapping the digital transformation of medicine in an interdisciplinary and interactive way. In addition to imparting knowledge, the focus is on practical skills in dealing with digital applications and a reflection of personal attitudes. Knowledge - skills - attitude: Only the integration of these three aspects leads to competence.

2. Description of what was done and the approach:

1500 character(s) maximum

Digital communication, smart devices and apps, telemedicine, virtual/augmented reality and robotic, artificial intelligence and big data are core topics of the curriculum. The local team of lecturers consists of doctors, psychologists, computer scientists and medical ethicists. It is

supplemented by external lecturers from medical start-ups, the state data protection department and patients who use digital applications. The aim is to reflect the interdisciplinary nature of digital medicine with a variety of perspectives and broad expertise.

The blended learning curriculum "Medicine in the digital age" consists of six compulsory learning modules, each of which consists of an approx. 2-hour e-learning unit and a 4-hour classroom teaching unit and transfer projects.

Simulations with app-based treatment concepts, video consultation hours and discussion rounds enable active and practical interaction with the new treatment concepts. In critical discussions between the participants and the teams of lecturers, the opportunities and possibilities as well as the risks and limitations of digital medicine become visible.

3. Facts

a. Target group

1500 character(s) maximum

Medical Students in the 2nd and 3rd year of the clinical curriculum.

b. Curriculum year educational programme (if applicable)

1500 character(s) maximum

2nd and 3rd year of the clinical curriculum

c. Study load (ECTS, 1 ECTS = ca. 28 hours)

1500 character(s) maximum

Approx. 1.5 ECTS point

The evaluation in the form of semi-structured interviews showed a high acceptance of the course concept. The students emphasize the perceived appreciation and motivation through the intensive and creative cooperation among themselves and with the lecturers. Especially the possibility of practical interaction and clarification of medical care concepts were positively evaluated.

4. Lessons learned:

1500 character(s) maximum

The development of a digitization strategy and its didactic mediation is thus a relevant component of future planning for the curricular development of medical studies for all locations, but also for the further education and training of the medical profession.

In the future, this will require a comprehensive implementation in the curriculum. In this context, it must be critically reflected whether and how the range of courses presented here is scalable. We are convinced that the practical and reflective parts, even when scaled to the number of semesters, should be represented in the form of internships for a maximum of 15-20 students in order to foster exchange.

When developing these curricula, the high speed of the change process should also be taken into account and curricular adaptation in the sense of "agility by design" should be made possible right from the conception stage.

Literature:

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