

X OGÓLNOPOLSKIE WARSZTATY Z OKAZJI ŚWIATOWEGO DNIA RADIOLOGII

Wydarzenie Towarzyszące i SAFE Europe ERASMUS +



Polskie Towarzystwo Elektroradiologii

Digital Skills of Radiation Therapists/Therapeutic Radiographers (RTT/TRs) - an investigation for a European educational curriculum

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Disclaimer

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❖ Background

- Evolution of radiotherapy
- Society's digitalisation
- European initiatives
- RTT/TRs European regulation

❖ 1st phase: Literature search

- Materials and methods
- Results

❖ 2nd phase: Survey

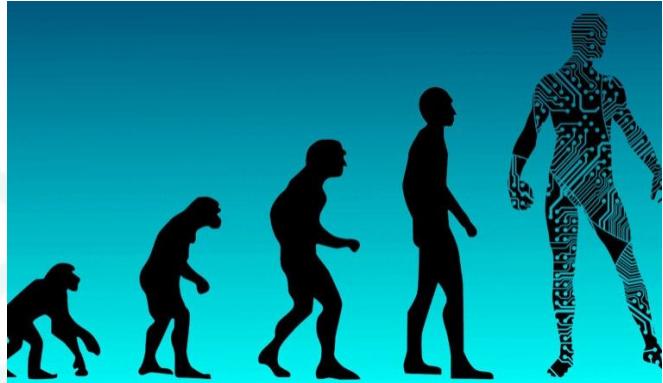
- Materials and methods
- Preliminary results

❖ Discussion/Conclusion

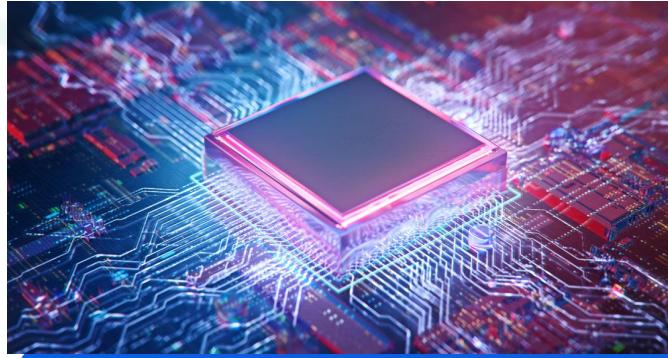
❖ Future directions

Content

Evolution of radiotherapy



Increase in complexity



Computer's processing power

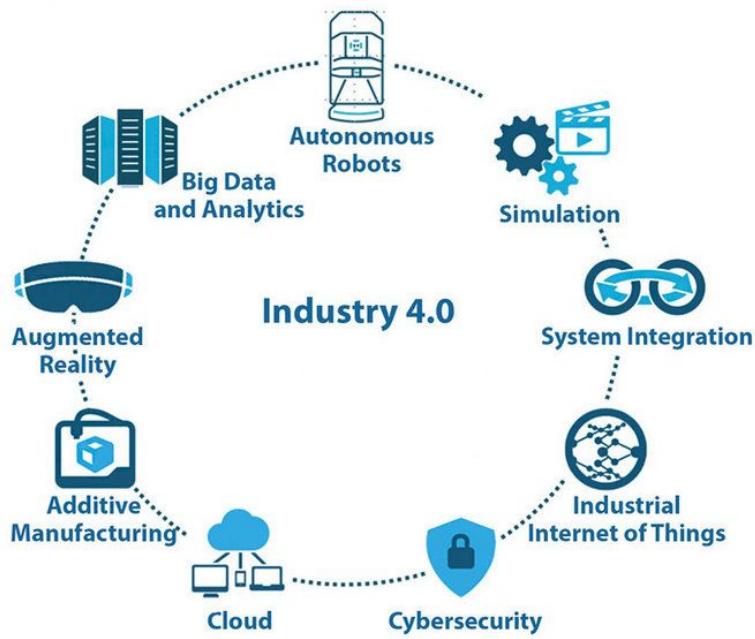
- boost RT precision
- lead to changes in clinical practice
- contribute to better outcomes for patients



Modern RT

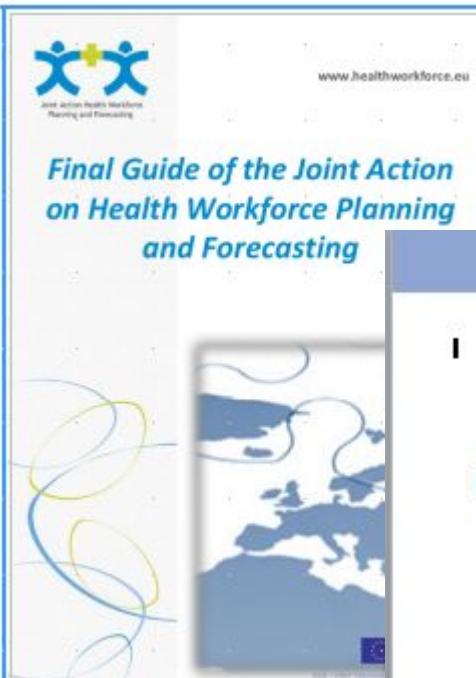
- RTT/TRs need specialized skills

Society's digitalisation

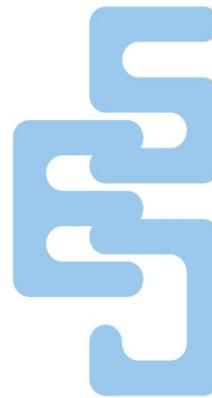


European initiatives

- ❖ Given the need for digital skills, several European initiatives have emerged.



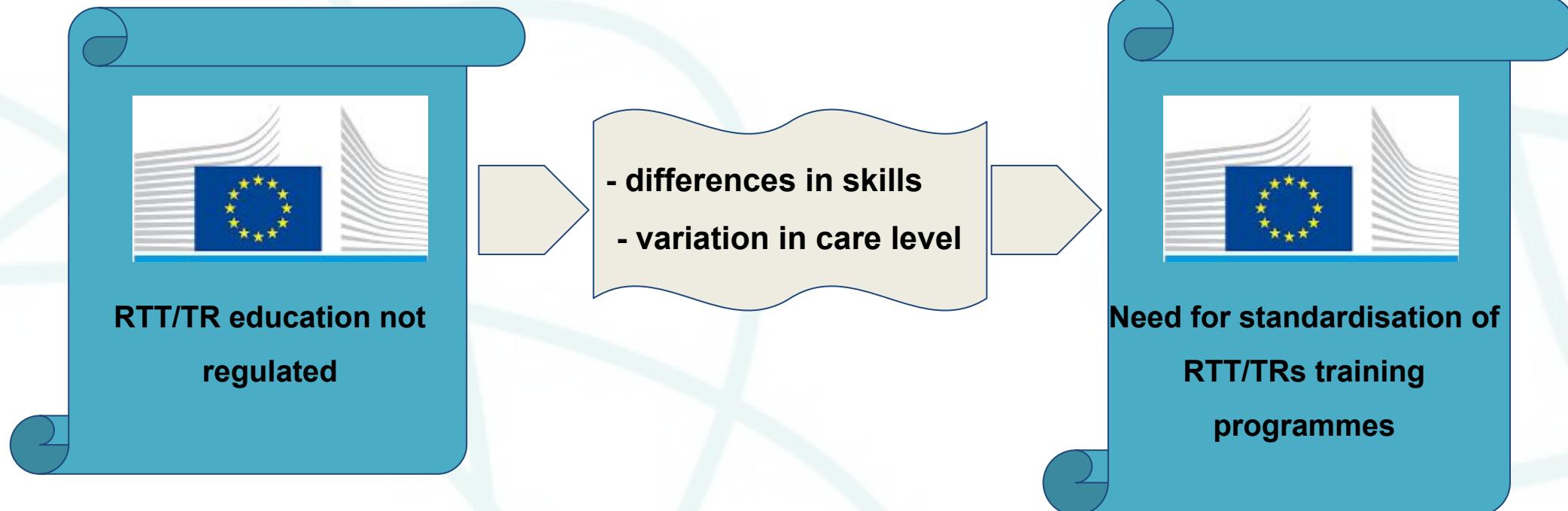
Skills, qualifications and jobs in the EU: the making of a perfect match?



Digital Skills and Jobs Coalition



RTT/TRs European Regulation



- ❖ **AIM:** identify RTT/TRs' digital skills through the analysis of published literature.



Literature search

Systematic search of the white literature

- ❖ Databases and journals:
 - PMC
 - Science Direct
 - PubMed
 - ERIC
 - Cochrane Library
 - IEEE Xplore
 - Radiography
 - tipsRO

Query:

```
(digital) AND (competenc* OR task* OR skill*) AND ("therapeutic radiographer" OR "therapeutic radiography" OR radiographer* OR radiotherapist* OR RTT* OR "radiation therapist" OR "radiation technologist" OR "radiation therapy technician" OR "Radiological technologist" OR "Radiological technician") AND (radiotherapy OR "radiation therapy" OR "radiation oncology")
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Identification of relevant grey literature

- ❖ Educational guidelines
- ❖ Recommendation and benchmark documents
- ❖ Reports, projects and frameworks
- ❖ Technical support manuals

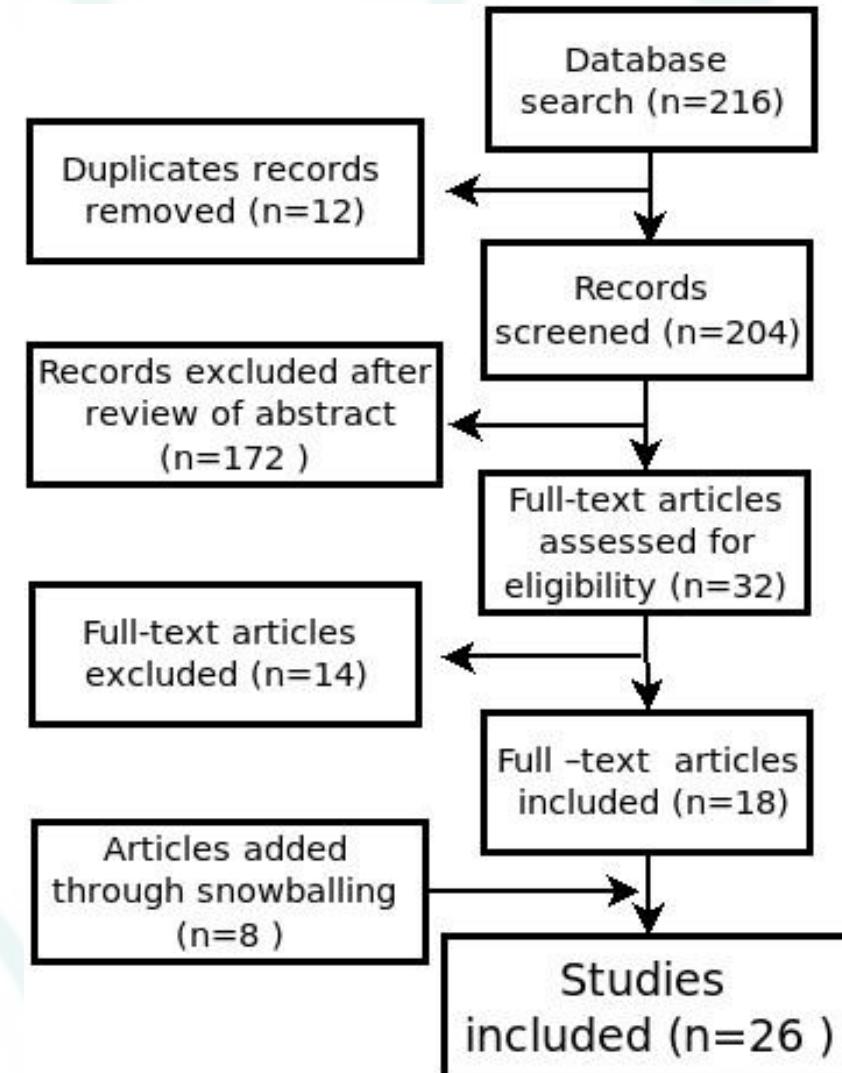
1st phase: Results

Inclusion criteria:

- Last 10 years
- English language
- Focus on digital skills or tasks performed digitally by RTT/TRs

Exclusion criteria:

- Other healthcare professionals
- Non-digital skills of RTT/TRs



1st phase: Results



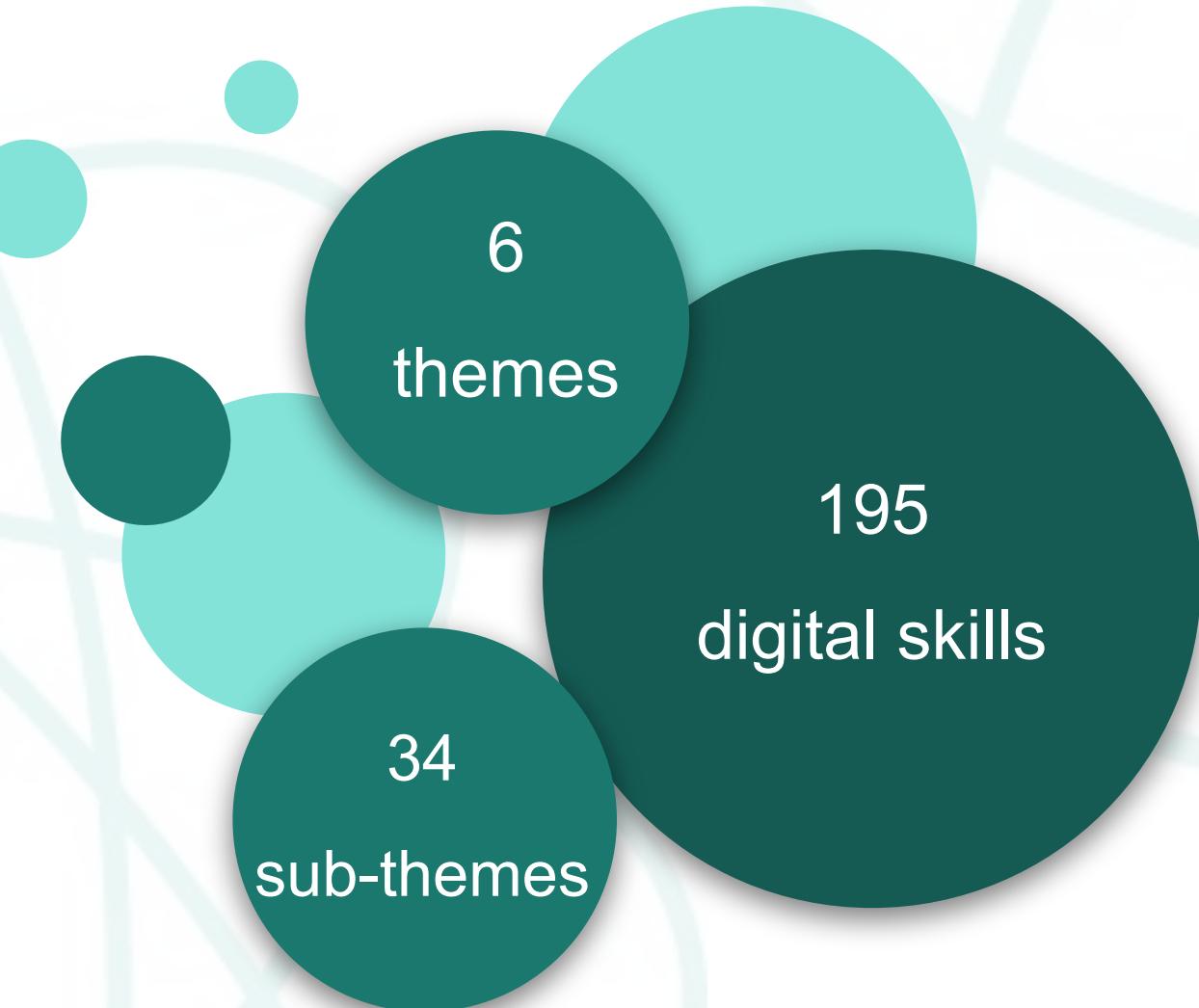
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1st phase: Results

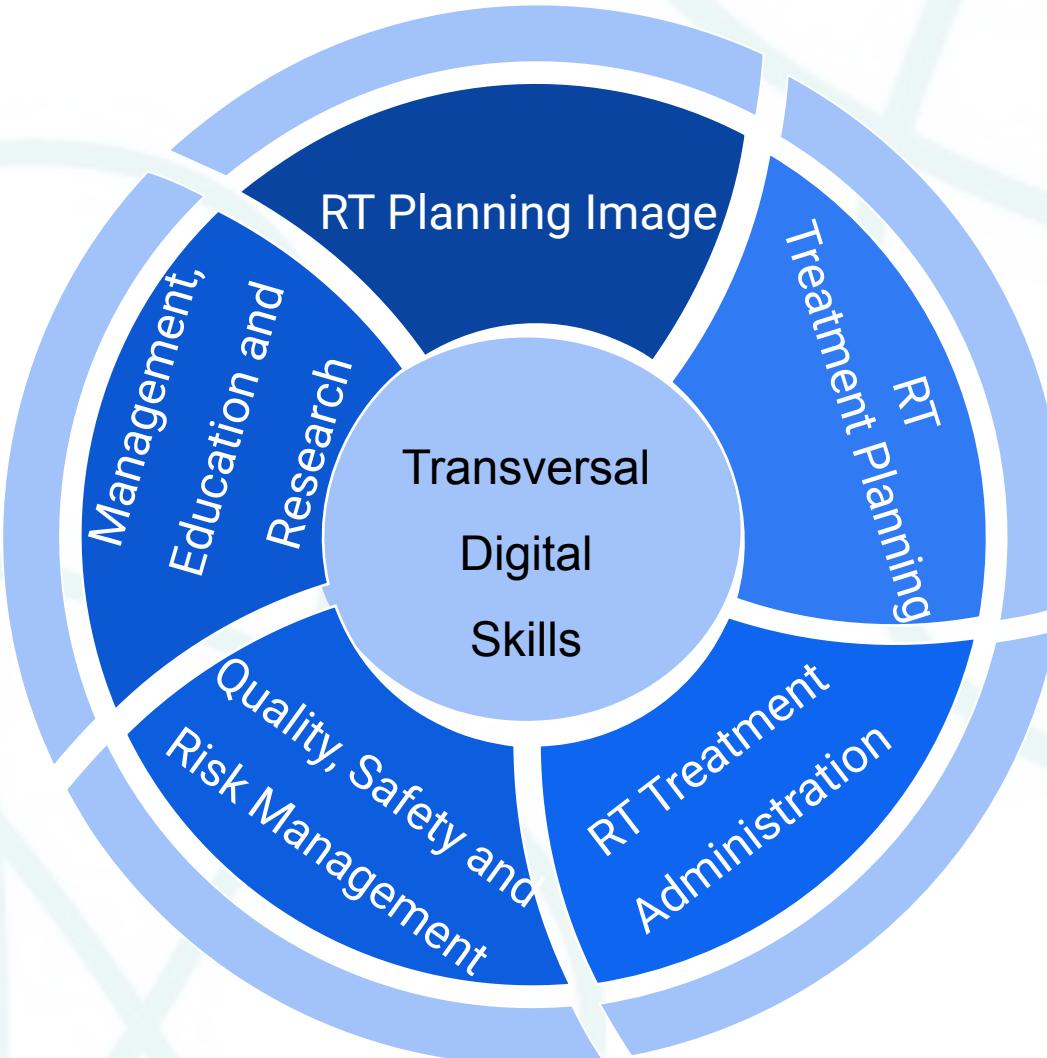


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1st phase: Results



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1st phase: Results

Transversal Digital Skills

- Technologies/ Information Systems (IS)
- Communication
- Electronic Patient Record (EPR)
- Patient Agenda
- Workstation

RT Planning Image

- Computerised Tomography (CT)
- 4D Computerised Tomography
- Image Processing and Enhancement
- Image Registration and Correlation
- Image Segmentation and Contouring

RT Treatment Planning

- Plan Treatment
- Plan Parameters (forward planning)
- Inverse Planning (IMRT/VMAT)
- 4D Planning
- SRS/SBRT Planning
- Dose Calculation
- Plan Evaluation
- Prerequisites for Treatment

RT Treatment Administration

- System Setup
- Treatment Delivery Preparation
- Treatment Verification: Conventional Techniques
- Treatment Verification: Advanced Techniques
- Image Matching
- Image Analysis
- Treatment Delivery
- Respiratory Gating Treatment Delivery
- SRS/SBRT Treatment Delivery

Quality, Safety and Risk Management

- Quality Assurance
- Security
- Risk Management
- Data Protection
- Information Integrity

Management, Education and Research

- Department Administration and Management
- Education
- Research

1st phase: Results

		Examples
Transversal Digital Skills	Communication	<ul style="list-style-type: none">• Use an internal communication channel• Create multimedia content for patient education
RT Planning Image	Computerised Tomography (CT)	<ul style="list-style-type: none">• Create scan protocols• Set acquisition parameters
RT Treatment Planning	Dose Calculation	<ul style="list-style-type: none">• Select calculation parameters• Calculate dose distribution
RT Treatment Administration	Image Analysis	<ul style="list-style-type: none">• View online/offline images• Use analysis tools
Quality, Safety and Risk Management	Security	<ul style="list-style-type: none">• Record all procedures concerning the radiation delivered• Review LINAC, MLC and imaging system failures/interlocks
Management, Education and Research	Research	<ul style="list-style-type: none">• Use search engines and digital libraries• Use data analysis software

❖ AIM: Assess the level of development and training needs of RTT/TRs regarding digital skills.

Survey divided into 2 parts:

- (1) professionals' socio-demographic characteristics (education level, age, gender, work experience, ICT);
- (2) level of development of RTT/TRs' skills and identify at what stage these skills are developed.

Section 1 of 18

An investigation of Digital Skills required by Therapeutic Radiographers/Radiation Therapists in the EU

Invitation and Information Letter

Dear participant,

We would like to invite you to participate in a survey which is part of the Safe and Free Exchange of EU Radiography Professionals across Europe - SAFE EUROPE project (www.safeurope.eu) and the PhD study entitled "Digital Skills for Therapeutic Radiographers/Radiation Therapists (TRs/RTTs)".

Aim and Objectives

The aim of this survey is to assess the knowledge of digital skills required by TRs/RTTs who practice Radiotherapy. The study also aims to identify the factors that influence the level of knowledge obtained, the stage these skills are developed, as well as highlight new emerging digital skills that are required for the job.

Methodology

This survey will be distributed across Europe by national and European professional associations, through SAFE EUROPE's partners. It will take approximately 30 minutes to complete. You can withdraw at any time before your submission.

Ethical considerations

All data will be treated under the General Data Protection Regulation of the University of Ulster and will be accessed by the research team only. Some of your free text responses may be included as direct quotes in published material however, we will ensure that individual participants cannot be identified. All the data collected will be used and stored in accordance with the Data Protection Act 1998. All electronic data will be anonymously stored on a password protected computer in a locked room at Ulster University for 10 years. The materials will then be destroyed in line with the University policy. This study was previously submitted to and approved by the Ethics Committee of the University of Ulster.

Thank you for your input.

Section 1 of 18

Badanie umiejętności cyfrowych wymaganych przez elektroradiologów pracujących w radioterapii w UE

Zaproszenie

Chcielibyśmy zaprosić Cię do wzięcia udziału w badaniu ankietowym, które jest częścią projektu Safe and Free Exchange of EU Radiography Professionals across Europe - SAFE EUROPE (www.safeurope.eu) oraz studium doktoranckiego zatytułowanego "Digital Skills for Therapeutic Radiographers (TRs)".

Cel i założenia

Celem tego badania jest ocena wiedzy na temat umiejętności cyfrowych wymaganych przez elektroradiologów, którzy pracują w dziedzinie radioterapii. Badanie ma również na celu określenie czynników, które wpływają na poziom uzyskanej wiedzy, etap rozwoju tych umiejętności, jak również zwrócenie uwagi na nowe pojawiające się umiejętności cyfrowe, które są wymagane w pracy.

Metodologia

Niniejsza ankieta zostanie rozprowadzona w całej Europie przez krajowe i europejskie towarzystwa i stowarzyszenia naukowe elektroradiologów, będącymi pośrednictwem partnerami programu SAFE EUROPE. Wypełnienie ankiety zajmie około 30 minut. Wypełniając ankietę, w każdej chwili można się wyciąć.

Względ etyczne

Wszystkie dane będą traktowane zgodnie z Ogólnym Rozporządzeniem o Ochronie Danych Osobowych Uniwersetu w Ulsterze i będą dostępne tylko dla zespołu badawczego. Niekto z Twoich odpowiedzi tekstowych mogą zostać włączone jako bezpośrednie cytaty do opublikowanego materiału, jednakże zapewniamy, że indywidualni uczestnicy nie będą mogli zostać zidentyfikowani. Wszystkie zebrane dane będą wykorzystywane i przetwarzane zgodnie z ustawą o ochronie danych osobowych z 1998 roku. Wszystkie dane elektroniczne będą anonimowo przechowywane na chronionym hasłem komputerze w zamkniętym budynku Uniwersytetu Ulster przez okres 10 lat. Następnie materiały zostaną zniszczone zgodnie z polityką Uniwersytetu. Badanie to zostało wcześniej zgłoszone do Komisji Etycznej Uniwersytetu w Ulsterze i przez nią zatwierdzone.

Dziękujemy za Państwa wkład.



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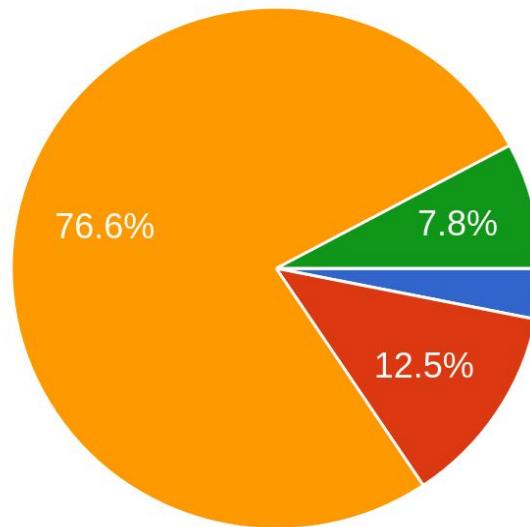
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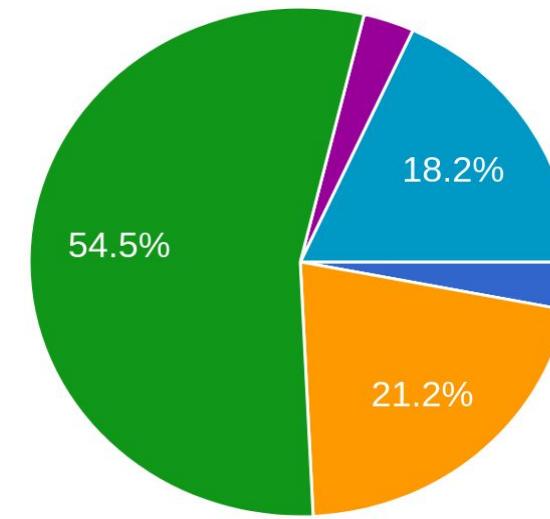
2nd phase: Preliminary Results

Academic level to practice RT (EQF)



- EQF 4 - Secondary level course
- EQF 5 - Short higher education programme
- EQF 6 - Bachelor's degree
- EQF 7 - Master's degree
- EQF 8 - Doctoral degree

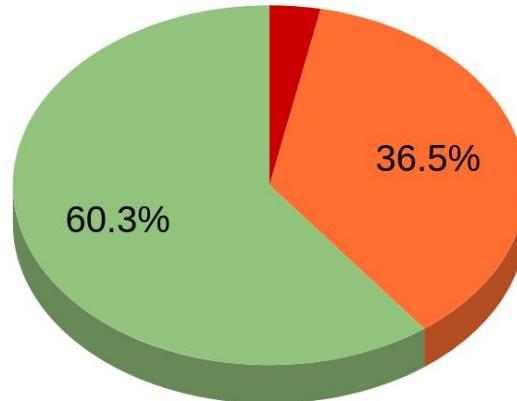
Highest academic level (EQF)



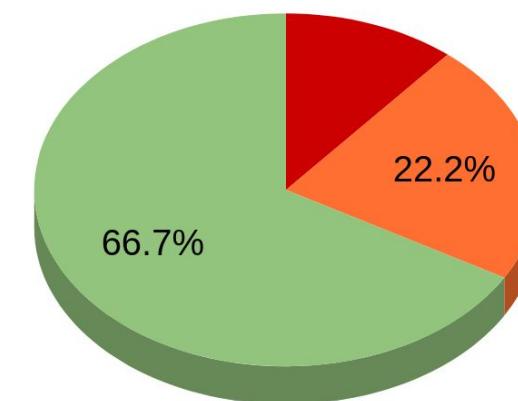
- EQF 4 - Secondary level course
- EQF 5 - Short higher education programme
- EQF 6 - Bachelor's degree
- EQF 7 - Master's degree
- EQF 8 - Doctoral Degree
- Other

2nd phase: Preliminary Results

Information processing

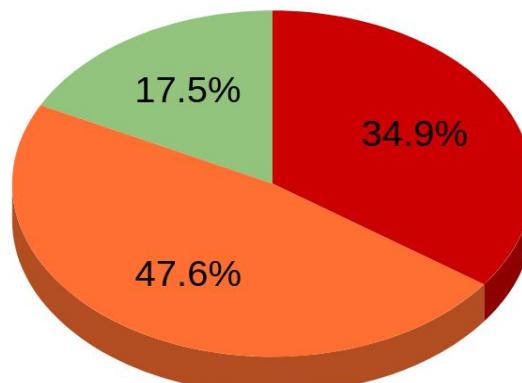


Communication

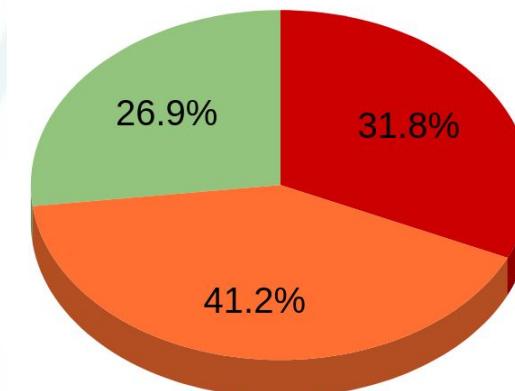


● Basic user ● Independent user ● Proficient user

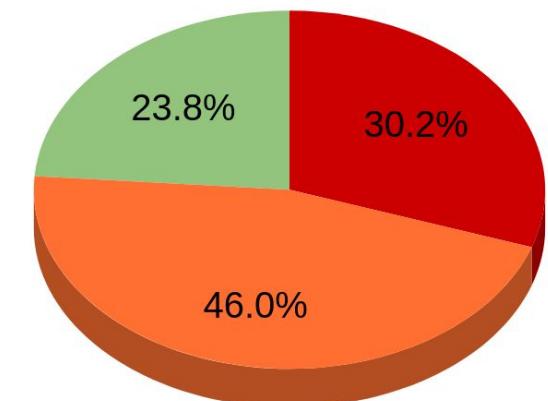
Content creation



Safety



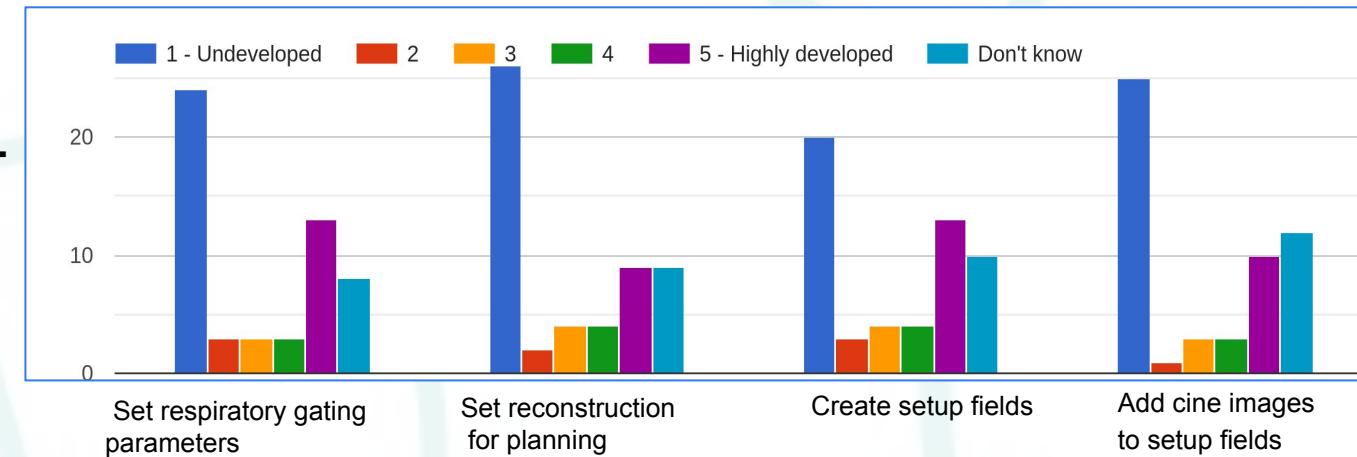
Problem solving



2nd phase: Preliminary Results

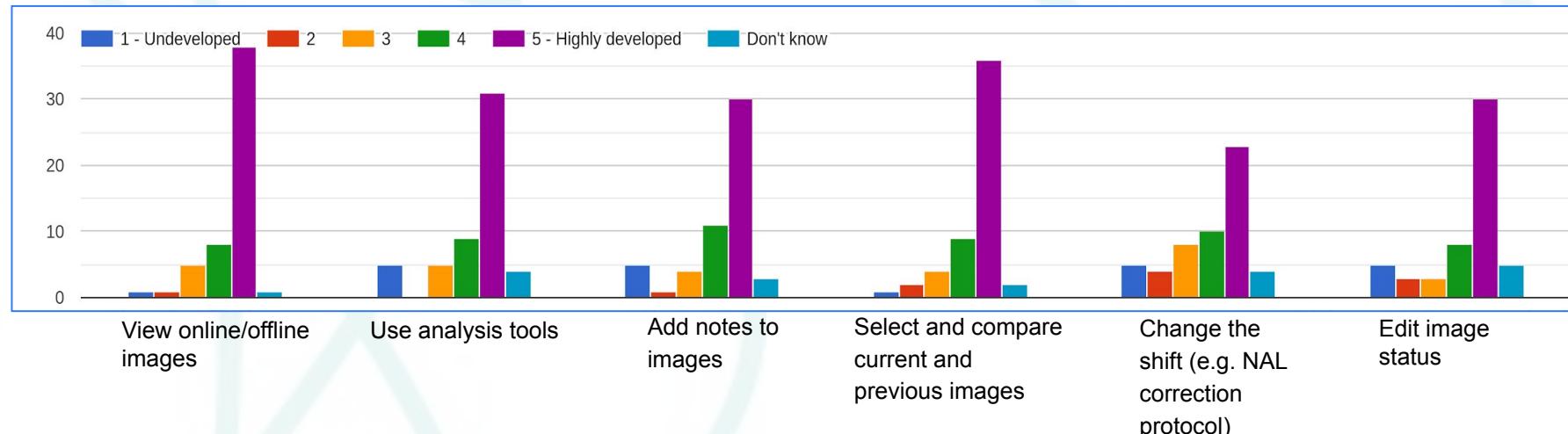
TREATMENT PLANNING

4D planning Skills - development level

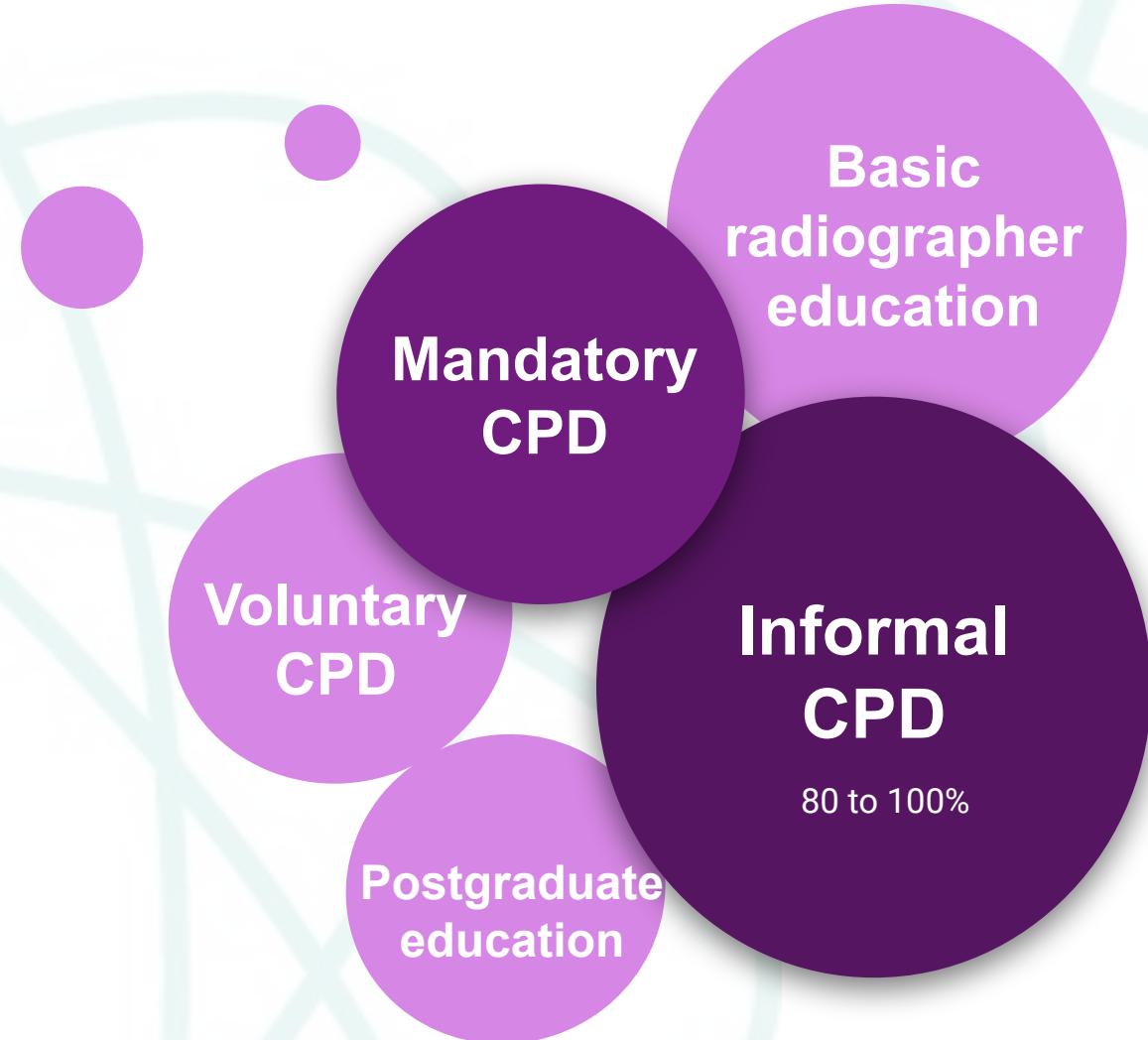


TREATMENT

Image analysis skills - development level



Digital skills' development- contexts



Discussion

- ✓ Successful implementation of digital technology depends on the healthcare professionals digital skills.
- ✓ Ensure that RTT/TRs are trained with the necessary skills, to adopt the best practice across Europe.
- ✓ It is the first study to present a dedicated list of the digital skills of the RTT/TRs.
- ✓ Closing the digital skills gaps will improve the quality of practice which will result in better patient outcomes.

Discussion

- ✓ Survey preliminary results:
 - Areas of intervention (ICT): content creation and problem-solving skills.
 - Undeveloped digital skills in the dimension “Treatment Planning”;
- ✓ RTT/TRs must have a good level of digital skills, or risk losing autonomy and influence.
- ✓ This set of digital skills will also allow for the anticipation of future needs, regarding the new technologies (ML, big data and cybersecurity).
- ✓ Make RTT/TRs co-developers of digital solutions for RT workflow.

Future directions

- ✓ Focus group interviews design:
 - Based on the European survey
 - Stakeholders: RTT Managers, Lecturers, Vendors representatives, Supervisors, Students

- ✓ Recommendations and webinars:
 - Sessions based on the gaps identified
 - Ensure that the RTT/TRs are educated with the necessary skills to enable them to practice across Europe

Manuscript submitted “Digital Skills of Radiation Therapists/Therapeutic Radiographers - document analysis for a European educational curriculum”.

Acknowledgements

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"You can have the most technologically advanced device in the world, but if you don't know how to operate it, it will be as useful as jumbo-jet without a pilot".

European Health Parliament. Digital Skills for Health Professionals. 2017.

Thank you



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<https://www.safeeurope.eu/>



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Ulster
University
(Project Coordinator)



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