ENSURING QUALITY HEALTHCARE PRACTICE FOR DOCTORS AND MEDICAL ALLIED PROFESSIONALS THROUGH A DIGITAL INTERACTIVE AUDIT PLATFORM

F. Papamalis[1], S. Cunningham[2], P. Hodges[2], A. Grochowska[3], A. Stefanowicz-Kocol[3], I. Poultourtzidis[1], M. Lillo-Crespo[5], M. Nikolaidou[1], S. Ko[5], V. Höijer-Brear[6], M. Törne[6], Z. Tilley Zoe[5], S. Felliciano[7], S. Konstantinidis[5], D. Spachos[1], P. Bamidis[1]

[1]Lab of Medical Physics and Digital Innovation School of Medicine Aristotle University (GREECE)
[2]Middlesex University (UNITED KINGDOM)
[3]University of Applied Sciences in Tarnow (POLAND)
[4]University of Alicante. (SPAIN)
[5]University of Nottingham (UNITED KINGDOM)
[6]Satakunta University of Applied Sciences (FINLAND)
[7]Knowledge Innovation Centre (MALTA)

Abstract

Internationally there are different requirements for measuring and monitoring health care practice and cross-border clinical placement. However, the quality of the clinical training settings has a significant impact on student experience and knowledge and eventually on the quality of the healthcare services. HealINT4ALL funded by the European Union aims to develop a global prepared health workforce regardless of cultural, political or educational context. Despite the great diversity due to the different needs, resources, regulations etc., there is a clear need for harmonised minimum training requirements especially for healthcare professions and from those benefiting from automatic recognition across the EU such as doctors, nurses and midwives, as reflected by the EU Directive (2013/55/EU). In offering international mobility, universities must ensure that learning environment standards are ethical and commensurate with their own quality assurance processes. For medical professions, demonstrating the quality of clinical practice internationally can be a challenging task. The project will innovatively adapt the newly established audit protocol and support tools to suit the needs of higher education for wider application in learning environments in medical-related professionals. The participatory co-creation methodology involving end-users in workshops to ensure alignment of the digital content with the learning needs of the students is essential to facilitate consistency and assure confidence for all stakeholders in the audit process and its outcomes. In order to facilitate quality assurance, consistency and raise standards of care, a digital interactive audit platform, supported by access to a central database is incrementally developed. The triangulation of the evidence obtained from the mapping exercise of the participating countries, provided the basis for the development of the first part of the digital audit platform.

Keywords: clinical placement, auditing system, students learning, digital interactive audit tool, healthcare services.

1 INTRODUCTION

The health professions are passing through a transformative phase with direct implication on students' learning. Internationally, there are different requirements for measuring and monitoring healthcare practice and the cross-border quality of education.

The quality of the clinical placement has a significant impact on student learning and is inextricable linked with the effectiveness of healthcare system. HealINT4ALL funded by the European Union aims to develop a global prepared health workforce regardless of cultural, political or educational context and could contribute towards curriculum transformation that enhance learning in the clinical environments of health professions. The Carnegie Foundation for the Advancement of Teaching highlights the need for reforms in health professions educations, which foster the development of learning environments that integrate classroom and clinical concepts emphasising clinical reasoning [1]. Likewise, the World Health Organization (WHO), in the Framework for Action on Interprofessional Education and Collaborative

Practice [2], argues for the infusion of interprofessional education in undergraduate health professions programmes. However, these recommendations to health professions education are made at a time that health education is confronted by immense challenges, such as disproportionate number of student numbers to available clinical facilities, scares resource and emerging health crises, such as the COVID-19 pandemic, that inevitably affects the capacity of the traditional clinical placement models to support students learning [3].

A major challenge is ensuring that medical and allied health professional can have such rich experiences and the quality assuring of placement experiences for students. HealINT4ALL provides Medical Education and Professionals Allied to Medicine with an audit system to facilitate quality assurance of EU clinical learning environment. Quality assured clinical learning, including evidence shared across boundaries, will support medical and allied healthcare professional international workforce the ability to transfer skills and practice and offer best interventions to enhance patient treatment. The HealINT4ALL tool will also promote inclusivity, as students will have the opportunity to obtain an increased number and variety of safe optimised learning placements through extensive partnerships developed.

Therefore, the HealINT4ALL project, supports and further facilitates the transposition process through the effective implementation of the EU legislative framework related to the shared evidence within the EU, due to benefits of free movement of health professionals (EC/36/2005 [4] amendment EU/55/2013 [5]),cross-border healthcare, which includes movement of patients to receive treatment (2011/24/EU [6]), the necessity for the recognition of professional qualifications and the updated harmonization of the minimum training requirements for professions benefiting from automatic recognition in particular for doctors, nurses, and midwives (Directive 2013/55/EU [7]. The project proposes the development of a digital interactive platform for portable pan-European and national placements appraisal in practice, with specific guidance following the appraisal audit protocols. The functional audit tool will be enabled for use on portable devices and will include a central database with capability for use by partner universities. It is expected that the audit tool will enable capability to address organizational level quality assurance and individual learning environments separately to enable best use of time and facilitate the inclusion of a number of clinical placement settings within a single organization. For this purpose, a virtual interactive teaching package for training the auditors has been designed, which enables learning to take place through self and blended learning approaches.

Partnerships between home organisations and the partner institutions that students visit, are at the root of transcultural [8] and wider professional learning. However, there is a great diversity in this relationship, as there is no consensus on what are the components in the structure, the support or the assessment that lead to more successful student learning [9]. Acknowledging this gap and the diversity in regulatory, administrative and quality assurance mechanisms in EU countries, HealINT4ALL works towards the wider adaptation of international placement audit and quality assurance tools to nursing, physiotherapy, midwifery and medicine. This paper focuses on the methodology and the incremental steps utilized for the development, adaptation and validation of the HealINT4ALL interactive e-platform and its training for auditing clinical placements and evaluation of the learning environment for institutions who want to exchange students to national and international settings and meet the agreed requirements. As mentioned, this project aims to facilitate an existing gold standard audit benchmark and best practice implementation and will add to existing materials to enhance digital capability and portability.

1.1 Digital interactive platform for European and national placements appraisal

Promoting internationalisation is fundamental and core within the HealINT4ALL project, because enabling students offers a sustainable means to consolidate and improve global evidence around best practice for clinical learning across the wider professional of medical and allied health sector. The assessment of clinical placements to support international mobility and the provision of the best clinical learning environments, require innovation to assure audit material resources that are fit for purpose, can work well within the situation and provide the correct teaching and learning to train auditors. This is essential to facilitate consistency and assure confidence for all stakeholders in the audit process and its outcomes.

Quality assured clinical learning, including evidence shared across boundaries, will support a globally prepared Medical and allied health personnel to transfer skills and practice and offer best interventions to enhance patient treatment. The primary aim of the HealINT4ALL is to develop a robust audit mechanism, which uses well established metrics, to benchmark placement quality and support for a wider range of health professional students across health facilities and universities in different EU countries. In this way, students will be confident that they can obtain an increased number and variety of safe optimized learning placements through extensive partnerships developed, thus fostering inclusivity. Opportunity to increase high quality placements internationally through the wider application

of the system to the International Organisation for Standardization (ISO), International Workshop Agreement (IWA) will be explored, as quality assurance will be benchmarked to this standard. Development of the skills and knowledge of auditors and auditor trainees to undertake audit is also critical and will be enhanced using new and innovative digital interactive resources. This project contributes to global citizenship as well as health and well-being supported by professionals in promoting high standards and best practice, which will be exported and disseminated widely across multiple professions and with capacity to be utilised across the world.

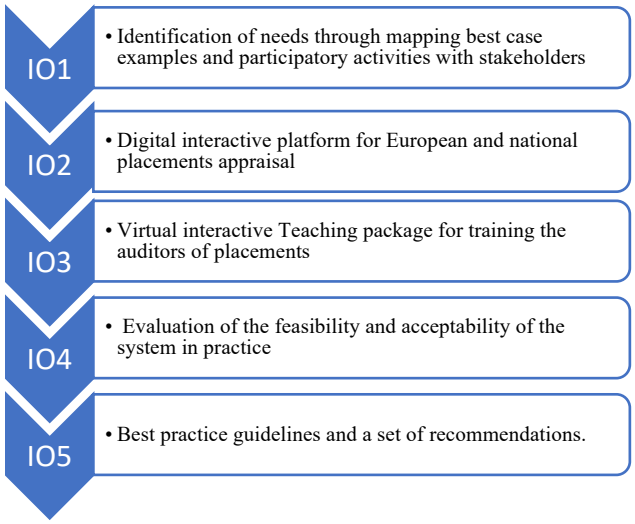

Figure 1 Output processes for HealIINT4ALL project (overall)

2 OBJECTIVES

1. To map and innovatively adapt newly established Audit Protocol and Support tools to suit the Higher Education needs for wider application to medicine and professionals allied to medicine.
2. To develop a digital interactive audit tool, which can be used in situ via iPads etc, supported by access to a central database, which can be easily managed by a provider and suit multi-professions.
3. To develop a virtual interactive learning and teaching resource for auditor preparation and update, which can be cascaded and incorporated into self-directed and blended learning.
4. To add further languages of the European Union and incorporate partners integration of the tools in all languages to facilitate wide use across multi-professions.
5. To execute an ongoing programme of intensive dissemination and impact evaluation in order to establish the HealINT4ALL Tools and subsequent IWA as the gold standard audit tool for the assessment of clinical placements supporting international mobility by all healthcare.

3 METHODS

Embracing the co-creation methodology and the participatory design shared care principles, the HealINT4ALL project partners set end-users in the spotlight, by actively engaging participants and partner institutions (universities, clinical placement of hospitals, healthcare professionals) from Spain, Greece, Poland, the UK and Finland in two milestone phases of the e-platform development and the training program: (a) the co-creation of the e-platform design, methodological training guide, and (b) the co-validation of the training program, by testing the e-platform (eLearning environment) and evaluating the final training material.

In order to achieve these objectives that really meets the needs and requirements of end-users, the HealINT4ALL project consortium followed a participatory approach, based on the co-design methodology and the mutual exchange of experience and know-how among all the involved stakeholders. Over the last decade, the co-design methodology has emerged as a significant bottom-up process - social in the means that it uses and in its ends - in which researchers, social innovators, citizens, vulnerable groups and civil servants co-create solutions from every aspect of the public life and

address the unmet needs of the society, based on the strong collaboration and involvement of all the different types of stakeholders [10, 11].

The participatory approach has been implemented through all the preparation steps of the training programme to collect requirements, to develop the training materials and specifications, as well as during the testing phase regarding the co-validation and evaluation of the entire development of the e-platform. In order to maximize the impact of stakeholders' involvement in the development of a coherent and effective training programme, the HealINT4ALL project consortium participated in all phases of the program design. To achieve this, a staged co-creation model was followed: i) in order to establish the "state-of-the-art" of best practice on clinical placements and its importance on students' learning, desk-based review was conducted to allocate available expertise and know-how on related projects and initiatives; interviews with structured questionnaires were used with experts from the healthcare and audit sector, and ii) open dialogue with academics/professors and auditors, regarding the co-creation of the implementation of the HealINT4ALL protocol and its potential impact on the organizational functioning of the clinical placements and their capacity to consistently provide students with evidence based clinical education.

3.1 Co-creation sessions to promote protocol awareness and audit process through the HealINT4ALL protocol

In order to increase protocol awareness, facilitate the implementation of the audit process, and design the tool, a series of co-creation sessions were realized. The first step was to invite in a meeting the stakeholders from clinical placement and university personnel in order to discuss the indicators of the protocol and the training elements of the e-platform, through a co-creation methodology. The co-creation session lasted 120 minutes' and it was audio recorded, after all participants provided their consent. A short presentation of the project's scope and objectives was made by the facilitator of the group and then certain parts around the elements of the protocol were discussed as follows: i) the necessity of the audit process; ii) the protocol and its basic indicators; iii) the audit process embedded into the HealINT4ALL platform; iv) and the impact of the organizational operation of the clinical placement.

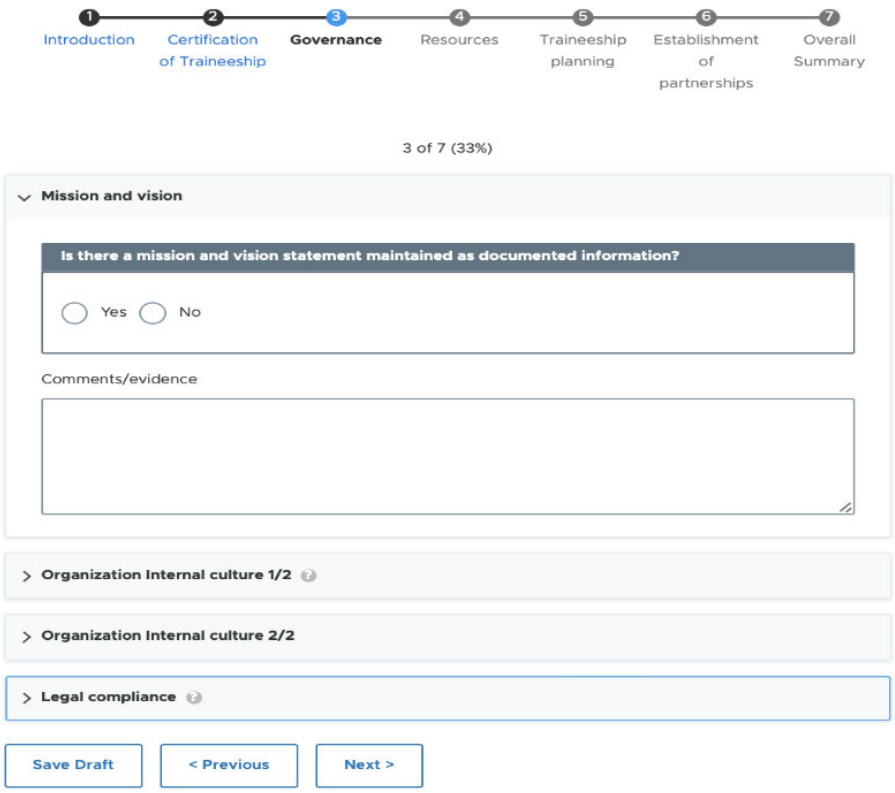

Figure 2. A section of the audit. A percentage indicator on the top displays the current progress and protocol indicators.

3.2 Development of the HealINT4ALL platform

From a technical perspective, the HealINT4ALL platform is based 100% on open source technologies. More precisely, we used Drupal[12][1] and the layout is implemented on the core theme Olivero[2] which provides the best experience regarding usability, accessibility and speed. Drupal is a flexible, open-source CMS that can easily be used to build websites, applications, and other digital experiences. It can be used for hybrid CMSs and headless CMSs as well. Furthermore, it supports unlimited users and content types, and can publish content in multiple languages and across many devices. Drupal is continuously modified and extended by a large community of users. It has eyebrow-raising advantages over other content management systems. The entire codebase will be released under MIT license and will be available under the main project repository [13, 14].

In a second round of co-creation sessions, end-users in every participating country were informed about the beta version of the tool designed by Aristotle University and the suggestions of end-users in every pilot site, which led to the development of the e-platform. In Greece, the co-creation session took place online on the 9th of June 2022 as a focus group with the active involvement of three academics actively involved on students and three experienced health professionals from a clinical placement. Greek participants agreed on the necessity for the audit process through the e-platform, provided valuable comments about its functionality and expressed their concerns regarding the potential implementation obstacles in daily clinical practice. Moreover, the participants also agreed on the co-created training modules, as it stemmed from the contribution of all participants' views, highlighting that "the modular structure of the training and the step-by-step interactive training guide, is the most comprehensive approach, which encompass all the training needs of auditors, clinical placements and the students. The modular structure of the training within the e-platform will allow the learners to increase their awareness of the protocol content, the rationale of auditing and the procedure utilized. Furthermore, the HealINT4ALL tool tailored by technical standards and specifications from the Education Informatics (EI) design pattern principles that allows communication with other information systems, usability, applicability and interoperability. The development of (EI) represents a more holistic and integrated view of the role of information systems and related practices to all aspects of the education environment.

3.3 HealINT4ALL Audit Tool eLearning Storyboard

The training design MOODLE as an abbreviation for "Modular Object-Oriented Dynamic Learning Environment" has been organized according to e-Platform functionalities, the protocol structure and its indicators in a form of electronic questionnaire with comprehensive pieces of information, using clear and simple language, pictures and videos, as requested by the majority of end-users. The training involves six courses, one being focused on the platform and comprises a series of scenarios of the Healint4All platform that were tested at the co-creation sessions.

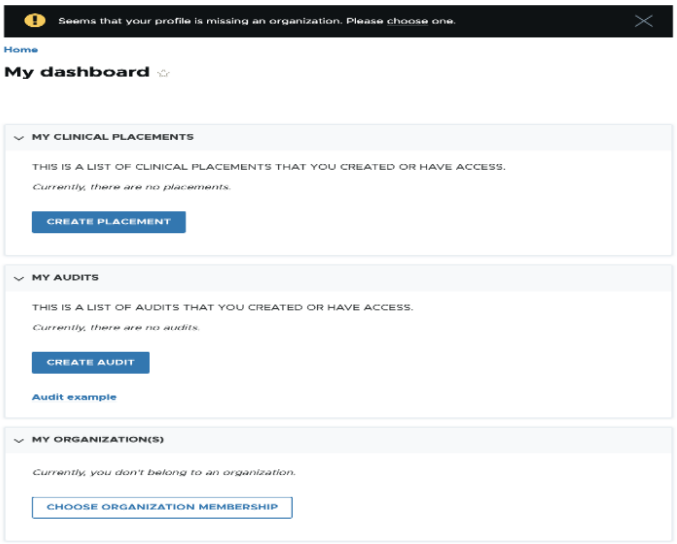

Figure. 3 Print screen of HEALINT4LL e-platform

1 https://drupal.org

2 https://www.drupal.org/project/olivero

3.4 Validating the HealINT4ALL e-Platform

The HealINT4ALL e-Platform (see Fig. 2), was finally validated in a two-step process by Greek participants that attended in a live demonstration and practice with the support of the researchers, during the second face-to-face co-working session, as well as on their own pace online practice at home for those, who had Internet connection and access to smartphones or tablets. The HealINT4ALL research team provided instructions for navigating the HealINT4aLL e-Platform and online training materials through the one-shot visit in the framework of the group meetings and the step-by-step guidance for exploring the platform through predefined scenarios that has been proved effective. The first evaluation of the e-platform system usability and applicability was made by the consortium members in order to get familiar with the structure of the e-Platform, its main features and the audit process. The participants expressed their satisfaction for the usability and user-friendly utilities and self-paced training at home. The platform included all the training materials presented and used for the audit indicators in the group meetings, like the informative material, the strategies/best practices, experiential activities and a range of scenarios.

Summarizing, the evaluation and implementation of the protocol through the HealINT4ALL e-platform, as part of the co-created methodological guide sessions, motivated participants to express their personal views on the impact of the audit process and the implementation of the protocol on students' clinical practice and learning. Within the same context, participants also provided valuable information about the impact of the protocol in both the quality of the clinical placements and the effectiveness on the provision of healthcare. Finally, the HealINT4ALL e-platform will allow inter-sectoral communication sharing evidence and information exchange among the clinical placements, auditors, healthcare organizations and universities. As a result, the protocol assessment and the auditors' feedback will provide the basis for the development of best practice guidelines and evidence-based recommendations, that will eventually increase the efficacy of healthcare interventions. This will also strengthen the enculturation process towards audit implementation and best practice interventions in the clinical placements, assuring quality and raise the standards of care.

REFERENCES

[1] Irby DM, Cooke M, Brien BCO. Calls for reform of medical education by the Carnegie Foundation for the Advancement of Teaching: 1910 and 2010. Acad Med. 2010;85(2):220–7.

[2] World Health Organization (WHO). Framework for action on interprofessional education & collaborative practice. Geneva: WHO Press; 2010. http://www.who.int/hrh/nursing_midwifery/en/. Accessed 15 May 2019.

[3] Keeping-Burke L, McCloskey R, Donovan C, Yetman L, Hansen L. Nursing students' experiences with clinical placement in residential aged care facilities. JBI Database System Rev Implement Rep. 2018;16(5):1109–16. https://doi.org/10.11124/JBISRIR-2017-003495.

[4] DIRECTIVE 2005/36/EC of the European Parliament and of the Council of 7 September 2005 on the recognition of professional qualifications

[5] DIRECTIVE 2013/55/EU of the European Parliament and of the Council of 20 November 2013 amending Directive 2005/36/EC on the recognition of professional qualifications and Regulation (EU) No 1024/2012 on administrative cooperation through the Internal Market Information System ('the IMI Regulation'

[6] Directive 2011/24/EU of the European Parliament and of the Council of 9 March 2011 on the application of patients' rights in cross-border healthcare

[7] DIRECTIVE 2013/55/EU of the European Parliament and of the Council of 20 November 2013 amending Directive 2005/36/EC on the recognition of professional qualifications and Regulation (EU) No 1024/2012 on administrative cooperation through the Internal Market Information System ('the IMI Regulation'

[8] Visovsky, C., McGhee, S., Jordan, E., Dominic, S., & Morrison-Beedy, D. (2016). Planning and executing a global health experience for undergraduate nursing students: A comprehensive guide to creating global citizens. *Nurse education today*, *40*, 29-32.

[9] Cunningham, S., (2017). Evaluating a nursing Erasmus exchange experience: reflections on the use and value of the Nominal Group Technique for evaluation. Nurse Educ. Pract. 26, 68–73. https://doi.org/10.1016/j.nepr.2017.07.002.

[10] Moulaert, F., MacCallum, D., & Hillier, J. (2013). Social innovation: intuition, precept, concept. *The international handbook on social innovation: Collective action, social learning and transdisciplinary research*, *13*, 13-23.

[11] Terstriep, J., Kleverbeck, M., Deserti, A., & Rizzo, F. (2015). Comparative report on social innovation across Europe. *Deliverable D3*, *2*, 201-212.

[12] Drupal - open-source CMS. Drupal.org. (2022, December 15). Retrieved January 12, 2023, from https://www.drupal.org/

[13] The MIT License (no date) The MIT License | Open Source Initiative. Available at: https://opensource.org/licenses/MIT (Accessed: January 12, 2023)

[14] https://github.com/dspachos/healint4all