Radiography 30 (2024) S1–S9

Contents lists available at ScienceDirect

Radiography

journal homepage: www.elsevier.com/locate/radi

Diagnostic radiography workforce expectations of learners against the 2023 HCPC standards of proficiency: Results of a UK Delphi study

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ARTICLE INFO

Article history:
Received 21 May 2024
Received in revised form
14 August 2024
Accepted 23 August 2024

Keywords:
Clinical placement
Assessment
Students
Education
Standards
Delphi survey

ABSTRACT

Introduction: The UK Health and Care Professions Council revised the Standards of Proficiency for diagnostic radiographers in 2023 to reflect modern practices and service needs. This will impact on the training and assessment of learners throughout their programmes in order to support them to meet the threshold standards.
Methods: A Delphi survey was distributed to UK diagnostic radiographers to ascertain the stage of training in which they expect each standard of proficiency to be demonstrated by the learner.
Results: Ninety-four diagnostic radiographers responded to the survey and 58.5% (n = 55) completed the second round of the survey. Participants agreed on the stage of pre-registration training that 74.9% of standards should be met. However, for 19.6% of standards there was no consensus. In 5.5% of standards participants expected these to be met one year post qualification.
Conclusion: Agreement of when three quarters of the new Standards would be expected to be met during pre-registration training could support practice placement learning and assessment. However, there is some uncertainty around the Standards and the ability to provide appropriate resources, support, and expertise to enable learners to meet them.
Implications for practice: The consensus of expectations could inform stage appropriate learning opportunities aligned to the 2023 HCPC Standards within practice placements, and a standardised assessment, should the appetite be established. However, the UK diagnostic radiography profession still has some work to do in aligning expectations with the statutory regulatory body requirements and preparing all staff to support learners to meet all threshold standards at point of qualification.

Introduction

The implementation of the 2023 revised Standards of Proficiency is arguably the most significant change for the United Kingdom (UK) diagnostic radiography profession since the Health and Care Professions Council (HCPC) was established as the new regulatory body in 2002. The HCPC periodically reviews the Standards of Proficiency and revisions are made with public and professional body consultation with the Society and College of Radiographers. Previously, relatively minor revisions and additions to the Standards were made,[1,2] often in response to external factors. In the last revision of the Standards in 2013, duty of candour was incorporated following widescale recommendations for the National Health Service (NHS) in response to failings identified in the Francis report[2]; and non-contrast computed tomography (CT) head imaging competency was introduced in response to the National Institute for Clinical Excellence (NICE) evidence-based guidelines promoting the importance of CT in patient pathways.[3,4]

Current diagnostic imaging practice has evolved, and demand has increased with imaging central to the success of healthcare policy initiatives and priorities around health promotion and early disease detection.[5,6] Delivery models of care have also morphed, centralising the patient, and advancing scopes of practice to streamline pathways, expedite patient care and improve patient outcomes.[7,8] The harnessing of technology and artificial intelligence to support digital health initiatives, and evolving practitioner roles is also changing the UK healthcare landscape. In response to these changes, the 2023 revision to the HCPC Standards of Proficiency for diagnostic radiographers not only aligns expectations for practitioners' competencies to current practices,[9] but those needed in the future for a more flexible workforce. The number of Standards has increased from 134 to 177. Some Standards remain similar but with

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https://doi.org/10.1016/j.radi.2024.08.014

changes to the wording of existing Standards designed to move registrants away from a passive understanding towards active implementation of the Standards.[9] Newly introduced Standards focus on the mental health and resilience of registrants, digital skills, leadership, centralising the patient and mastery of a wider variety of cross sectional imaging technologies with the introduction of competencies in magnetic resonance imaging (MRI), increasing the range of examinations and competencies in computed tomography, and assisting in interventional procedures.[9,10] The HCPC published comparison tables of the previous and 2023 Standards of Proficiency to highlight the changes.[9] Importantly, these changes significantly impact student learning and the threshold expectations of student knowledge and skills on qualification.

The College of Radiographers (CoR) Education and Careers Framework[11] ensures appropriate education underpins all levels of UK practice (practitioner, enhanced, advanced and consultant practitioner) and across the 4 pillars of clinical practice, education, research and leadership. Alongside this the CoR and HCPC Standards and requirements for approval guide the curriculum content and programme outcomes for diagnostic radiography training,[11–13] ensuring they are scaffolded by appropriate teaching, learning and assessment strategies which support learners to meet the threshold standards and competencies for practitioner level. Programmes define the learning outcomes achieved by stage of study, often adopting a spiral curriculum model where concepts are revisited and built upon with increasing complexity to develop the learners understanding of the bigger picture.[14] This may mean different programmes align particular Standards of Proficiency and achievement of them with different stage learning outcomes, depending on the design of their curriculum. Regardless of this, a constructive alignment approach to curriculum design, where the teaching methods and assessment support learning activities stated in the outcomes, is shown to appropriately support student learning.[15] Practice placements are integral to the learning and teaching strategy within diagnostic radiography programs globally, facilitating development and application of knowledge and competencies to which the assessment of professional practice is aligned.[16,17] Educational programmes have traditionally emphasised projectional radiography[18–20] placement experience over other imaging modalities, and as a result, education related to cross-sectional imaging, image interpretation and research have typically been reserved for the later year(s) of pre-registration study[19] or post registration. The majority of student practice placement learning takes place in the imaging department, with few programmes incorporating non-radiography and non-patient facing placements to support development of wider professional attributes and competencies.[20] Opportunities to utilise broader settings and more innovative placements to develop professional skills have been identified[16–18,20–26] and the continual change within the NHS, and increased demand for diagnostic radiographers, necessitates adaptation to professional education models.[27] In addition, changes within the 2023 HCPC Standards require a shift in practice placement learning expectations and objectives to support achievement of a broader range of proficiencies.[28]

The diagnostic radiography profession is now moving from a position of familiarity with the long standing 2013 HCPC threshold competency statements[3] and diagnostic radiography training, towards a set of new proficiency Standards and uncertainty in learning requirements.[28] In order to provide appropriate practice learning opportunities and objective and constructive feedback on student progression and achievement, transparent understanding of the 2023 Standards and consensus on the expectations of students at different stages of study, and perhaps beyond, are required. Therefore, this study explored the perceptions of diagnostic radiographers across the UK and their expectations of when learners would demonstrate achievement of each of the 2023 HCPC Standards of Proficiency statements. The underlying premise for this was to determine if the Standards were all deemed to be equally complex with mastery at point of qualification, or if any of the Standards would be expected to be met at earlier stages of training, much like the premise of a spiral curriculum, and if so, to identify which those Standards were. It is however acknowledged that the HCPC requires Standards to be met at point of qualification. A Delphi study approach was used as an established method of aggregating expert opinion.[29]

Method

A JISC online Delphi survey was created to ascertain consensus on what stage of training, or beyond, each of the HCPC 2023 Standards of Proficiency for diagnostic radiographers could be expected to be met. Diagnostic radiographers across the UK, where the HCPC Standards of Proficiency applied, were invited to participate. The survey was distributed in January 2023 prior to the implementation date for the Standards in September 2023 via Health Education England networks, professional and imaging networks, and social media platforms including LinkedIn and X (formerly Twitter). Prior to completion, participants were provided with a participant information sheet and asked to indicate consent to take part in the survey. A link to the HCPC website, outlining the changes to the 2023 Standards of Proficiency in comparison to the existing 2013 Standards, was provided in the survey information. Ethical approval was granted through the institutional ethics committee (EC27495).

The survey consisted of 199 statements derived from the 162 Standards of Proficiency for diagnostic radiographers (15 headings excluded). As some statements within the Standards were multifactorial, these were broken down into more than one statement. The authors determined six overarching themes by which the Standards could be mapped: *Communication; Person centred care; Key concepts of Radiography; Legislation; Development & Innovation; and Leadership*. The number of Standard statements was not evenly spread across the themes, with the highest proportion of Standard statements mapping to key concepts of radiography (n = 68/199; 34.2%%) (Table 1). These themes were used as subheadings to organise the survey questions and signpost participants.

In the first round of the Delphi survey, participants were asked to select from the following options regarding the stage of learning they would expect each Standard of Proficiency statement to be achieved:

- Student at End of Year 1 of Training.
- Student at Mid-Point of Training.
- Student At End of Training/Point of Qualification.
- Radiographer One Year Post Qualification.

The wording of these options was carefully chosen to accommodate different training pathways (e.g., 2-year pre-registration

Table 1
Distribution of survey statements across the six themes (n = 199).

Theme	Total No. of statements in each theme n (%)
Communication	17 (8.5%)
Patient centred care	35 (17.6%)
Key concepts of Radiography	68 (34.2%)
Legislation	27 (13.6%)
Development & Innovation	26 (13.1%)
Leadership	26 (13.1%)
Total overall	**199**

Masters programme and 3 or 4 year BSc undergraduate programmes). Consensus was defined as at least 50% participant agreement for the stage of training where proficiency achievement would be expected.[29] Two demographic questions were used to determine the role and location of participating radiographers. Contact details were requested where participants consented to take part in subsequent survey rounds. Additional free text questions explored how prepared participants felt to support and/or assess students to meet the 2023 HCPC Standards, and what would enable practice placement sites to support/assess students. Thematic analysis was independently undertaken by two researchers using Microsoft Excel to organise and code free text data. Coding was compared for concordance, reviewed and agreed before being organised into themes. Themes were re-checked against the coded extracts in an iterative process.[30,31]

The second round of the Delphi survey consisted only of the statements where consensus was not achieved in the first round. The results of the first round were also provided alongside each statement indicating the percentage of participants that opted for each of the four stages of development. This allowed participants to consider the wider professional view before making their own selection of appropriate stage in the second round.

Results

Ninety-four diagnostic radiographers from across Scotland, Wales and England completed the first round of the survey, and 55 (58.5%) went on to complete round 2. In both survey rounds, the greatest proportion of responses came from the North East and Yorkshire region: n = 42/94; 44.7% in round 1 and n = 22/55; 40.0% in round 2. The largest number of respondents identified themselves as radiographers working with students: n = 29/94; 30.9% in round 1 and n = 13/55; 23.6% in round 2 (Fig. 1).

Consensus was reached regarding expected stage of achievement for 18.6% (n = 37/199) statements after round 1 of the survey and a further 61.8% (n = 123/199) statements after round 2, resulting in consensus for 80.4% (n = 160/199) of statements overall (Table 2). The level of consensus across these 160 statements ranged from 50% to 84%. Participants agreed that 45 (22.6%) Standard statements should be met at the end of the First Year of Training; 17 (8.5%) at Mid-Point of Training; and 87 (43.7%) at the End of Training/Point of Qualification (Table 2). This resulted in agreement that 74.9% (n = 149/199) of Standard statements should be met during Pre-Registration Training. Additionally, for 11 (5.5%) statements, participants did not believe these Standards should be met during student training and instead agreed that the expected stage of achievement should be One Year Post Qualification (Table 2). In the remaining 39 (19.6%) Standard statements, consensus agreement was not met on the stage of training for the Standard to be achieved.

The greatest number of Standard statements expected to be met by the End of The First Year of Training (n = 21/45; 46.7%) fell under the theme of legislation. Topics under this theme related to confidentiality; information governance; health and safety; professional conduct; respect for and rights of service users and carers; effective communication skills; and the significance of radiation dose and risk versus benefit.

Only 17 (8.5%) Standard statements were expected to be met by students at the Mid-Point of Training. These focussed on modification of communication; understanding or responding to the needs of different groups and individuals; understanding ethical and legislative frameworks; and recognising the role of other health and care professionals and systems. None of the Standards related to the development and innovation theme were expected to be achieved by Mid-Point of Training.

Under each theme, with the exception of legislation, End of Training/Point of Qualification was the stage at which participants felt the greatest number of Standard statements should be met: 54.4% (n = 87/160) of all with consensus and 43.7% of all 199 Standard statements. Nearly half of those expected to be met at this stage were under the theme of key concepts of radiography and included assisting with: a range of more complex diagnostic imaging techniques; Ultrasound; CT examinations of the spine, chest and abdomen in acute trauma and to contribute effectively to other CT studies; and imaging procedures involving the use of radionuclides.

The 11 Standard statements that participants did not expect achievement of until One Year Post Qualification as a radiographer related to: performing standard MRI examinations; the use and analysis of information and data; quality management; quality improvement; research; and managing complex situations (see Table 3). Importantly, participant responses did not reach consensus on Standard statements relating to physical and mental health self-care; evidence-based practice and continued professional development (CPD) of the registrant and others; technical aspects of imaging equipment; dose calculations; fluoroscopic and interventional procedures; and performing CT examinations (see Table 3). Interestingly, of the Standards where no consensus was achieved or consensus was One Year Post Qualification, only 12 statements reflect a new or part of a new HCPC Standard of Proficiency (Table 3).

With regards to how prepared participants felt to support and/or assess students to meet the new Standards, 82 of the 94 participants in round 1 (87.2%) responded to the free text question. Thematic analysis indicated respondents fell in to one of four categories: not prepared; somewhat prepared; prepared; or unsure. Collating the frequency under these themes indicated that only 34 (n = 34/82; 41.5%) participants indicated they felt prepared.

> *'I feel highly prepared in this regard due to the guidance the universities have provided. For example, the student placement books and regular email updates from course leaders etc. As well as this the education lead radiographer also disseminates essential guidance to us regarding supporting and assessing students to make certain they reach their full potential.'* (ID34)

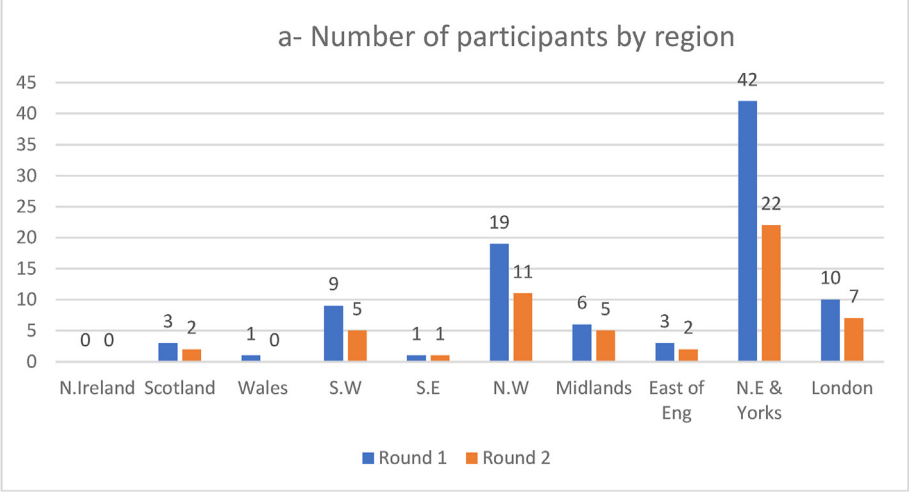
In contrast, other participants felt differing degrees of unpreparedness, relating this to a lack of resources, lack of guidance regarding the new Standards, and the degree of change in relation to current roles and expectations.

> *'Quite unprepared. We have limited capacity in CT/MRI already and will struggle to support the students enough to meet the new standards.'*(ID30)

> *'Unprepared, as these HCPC SoP* (Standards of Proficiency) *changes are drastic and unprecedented. It's hard to picture myself being confident to support the students through these changes when they're alien to me currently*' (ID53)

> *'Guidance for the new HCPC standards has so far been limited but I feel confidently able to support students in most aspects on clinical practice.'* (ID65)

With regards to participants responses as to what would enable practice placement sites to better support/assess student achievement against the new Standards, four further themes were determined: support and training; resources; desired attributes of assessments; valuing learners and training. Ninety -three out of 94 participants responded to this question which was only asked in the first round of the Delphi.



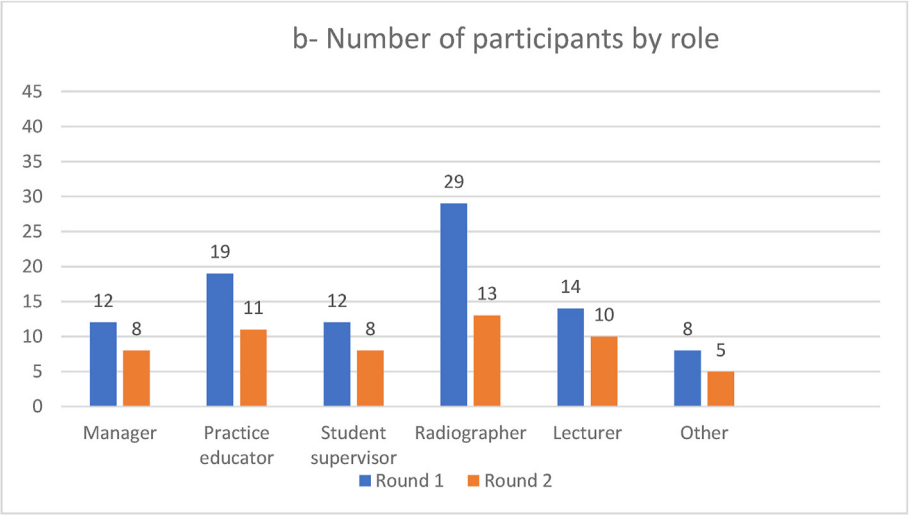


Figure 1. Demographics of participants.

Support and training

Participants expressed a need for information and clarity around the HCPC Standards and their implementation with some commenting that the wording of the Standards was vague.

'*More awareness of the new HCPC Standards of Proficiency*'. (ID70)

Communication, information and training and additional support from managers to ensure parity in the interpretation of the Standards within the practice setting and clarity over any changes to current working practices or roles was felt to be needed. CPD for staff was identified as important to ensure practitioners themselves met the 2023 Standards, but also for undertaking the role of supporting the learning and assessment of students in practice.

Table 2
Consensus on stage of achievement of Standard Statements by theme (n = 199).

Themes for standard statements	Number of standard statements n (%)				
	Statement standards by stage of consensus[a]				No consensus agreed
	Student at end of year 1 of training	Student at mid-point of training	Student at end of training/point of qualification	1 year post-registration	
Communication	2 (1%)	3 (1.5%)	5 (2.5%)	2 (1%)	5 (2.5%)
Patient centred care	8 (4.0%)	4 (2.0%)	13 (6.5%)	2 (1%)	8 (4.0%)
Key concepts of Radiography	4 (2.0%)	7 (3.5%)	42 (21.1%)	1 (0.5%)	14 (7.0%)
Legislation	21 (10.6%)	2 (1%)	2 (1%)	0 (0%)	2 (1%)
Development & Innovation	2 (1%)	0 (0%)	14 (7.0%)	5 (2.5%)	5 (2.5%)
Leadership	8 (4.0%)	1 (0.5%)	11 (5.5%)	1 (0.5%)	5 (2.5%)
Total	**45 (22.6%)**	**17 (8.5%)**	**87 (43.7%)**	**11 (5.5%)**	**39 (19.6%)**

[a] Based on consensus of 50% or above.

Table 3
Standards where expectations could not be agreed or deemed beyond pre-registration training (n = 50).

Theme Standard mapped to	Radiographer 1 Year Post Qualification	No consensus on stage to be met
Communication	7.9[a] Regularly reappraise information needs to provide service users with support and information 13.15[a]~ Use physical, graphical, verbal and electronic methods to collect and analyse information from a range of relevant sources including service user's reports, pathological tests and results, dose recording and treatment verification systems	7.5[a]~ Remove any barriers to communication where possible 7.6~Understand the need to support the communication needs of service users and carers, such as through the use of an appropriate interpreter 7.7[b]Use information, communication and digital technologies appropriate to their practice 8.1~ Work in partnership with service users, carers, colleagues and others 8.4 ~Contribute effectively to work undertaken as part of a multi-disciplinary team
Patient centred care	7.10~ Advise other healthcare professionals about the relevance and application of imaging modalities to the service user's needs 8.16[b] Understand the need to involve service users in service design, service delivery, education and research	5.5[b] Recognise the characteristics and consequences of barriers to inclusion, including for socially isolated groups 5.6[b] Actively challenge these barriers to inclusion, supporting the implementation of change wherever possible 5.7[b] Recognise that regard to equality, diversity and inclusion needs to be embedded in the application of all HCPC standards, across all areas of practice 7.8 Understand the need to provide service users or people acting on their behalf with the information necessary in accessible formats to enable them to make informed decisions 8.17 Understand the need to engage service users and carers in planning and evaluating their diagnostic imaging and interventional procedures 12.6~ Understand the role of the radiographer and other operators in the promotion of health and health education in relation to public health, healthy living and health screening for disease detection 13.27[a] Provide appropriate care for the range of service users and their carers before, during and after imaging examinations 15.3 Empower and enable individuals (including service users and colleagues) to play a part in managing their own health
Key concepts of Radiography	13.36[b] Perform standard magnetic resonance imaging procedures	12.1[a] Understand the structure and function of the human body 12.1[a]~ Have knowledge of physical and mental health, disease, disorder and dysfunction relevant to their profession 12.11~Understand and apply the principles of ionising radiation production, interaction with matter, beam modification, administration of radionuclides and radiation protection 12.12 Know the physical and scientific principles on which image formation using ionising and non-ionising radiation is based 12.13 Understand radiation dosimetry and the principles of dose calculation 12.15[a]~ Understand the capability and applications of equipment used in their profession 12.15[a]~ Understand the range of equipment used in their profession 13.19 Operate diagnostic imaging equipment safely and accurately relevant to their profession 13.24[a]Calculate radiation doses and exposures and record 13.30[a],[b]Assist with imaging techniques performed on anaesthetised or unconscious patients 13.34[a]Manage and assist with fluoroscopic diagnostic and interventional procedures 13.34[a]Manage and assist with fluoroscopic diagnostic and interventional procedures, that involve the use of contrast agents 13.35[a]Perform a broad range of computed tomography (CT) examinations, including standard head CT examinations 13.39[a],[b]Critically analyse clinical images for technical quality
Legislation		2.10[a]~ Apply current legislation, policies and guidance relevant to their profession and scope of practice 2.12~Practise in accordance with current legislation

(*continued on next page*)

Table 3 (*continued*)

Theme Standard mapped to	Radiographer 1 Year Post Qualification	No consensus on stage to be met
		governing the use of ionising and non-ionising radiation for medical and other purposes
Development & Innovation	11.3[a]~ Monitor and systematically evaluate the quality of practice 11.3[a]~ Maintain an effective quality management and quality assurance process working towards continual improvement 11.5[b] Evaluate care plans or intervention plans using recognised and appropriate outcome measures, in conjunction with the service user where possible, and revise the plans as necessary 13.11[b] Engage service users in research as appropriate 13.18 Manage complex and unpredictable situations including the ability to adapt planned procedures	1.3[a]~ Keep their skills and knowledge up to date 8.11[b] Promote and engage in the learning of others 11.1~ Engage in evidence-based practice 11.2~ Gather and use feedback and information, including qualitative and quantitative data, to evaluate the responses of service users to their care 11.4[b] Participate in quality management, including quality control, quality assurance, clinical governance and the use of appropriate outcome measures
Leadership	13.12 Formulate specific and appropriate management plans including the setting of timescales	2.11 Recognise the power imbalance which comes with being a health care professional, and ensure they do not abuse this for personal gain 3.4[a] Develop clear strategies for physical and mental self-care and self-awareness and safe working environment 3.4[a] Adopt clear strategies for physical and mental self-care and self-awareness and safe working environment 4.6 Demonstrate a logical and systematic approach to problem solving 8.10 Act as a role model for others

Numbers relate to the 2023 HCPC Standards of Proficiency for Radiographers.
~minor modification of wording.
[a] Part of the full 2023 standard (split in to more than one survey statement).
[b] New standards.

'The first thing is to ensure that all qualified staff comply with the standards, and this will require radiology management support to achieve.' (ID59)

'More CPD sessions and reflective practise.' (ID36)

In addition, there was also a feeling that education providers should have an increased role in supporting the learning and assessment of students in practice to reduce the impact of the new Standards on service delivery.

'More support from university staff by being on site more regularly. University staff providing sessions on the new regulations.' (ID25)

Increased practice placement time, combined with a reduction in student numbers, was felt to be needed to support students to achieve the new HCPC expectations. There was recognition that learners on apprenticeship routes had more time learning in the imaging department and this was perceived to have a positive impact on student performance and was a point of concern regarding achievement of expectations for students on traditional programme routes.

'Reduce the number of students back to previous years so students can be supported safely and are trained to the expected level, leaving university with all the knowledge and practical experience they need rather than double the cohort, half their clinical placement time and then enter the workforce having significant gaps and understanding in their knowledge. This has significant safety implications and employers are left to pick up the pieces. We have apprentice radiography students and the difference in their abilities compared to the standard route now is worlds apart. they also feel part of the team as spend most of their training in the workplace' (ID26)

Resources

Overwhelmingly, staff resource and time was identified as an issue in supporting learning and assessment. The need for more staff, and practice educators in a specific role related to this, was identified.

'Ongoing staff crisis being resolved [would help]' (ID47)

'More practice educator roles - time specifically allocated to clinical role to support and manage students' progress. This can be limited in some departments.' (ID90)

Some participants raised the increased number of radiography students in the department as being a barrier to student learning due to limiting access to available resources.

'Less students in one department at any one time. Too many students and not enough staff means that staff are unable to support the students individually' (ID73)

The quality, quantity or appropriateness of equipment and facilities was also felt to be a barrier for some, and identified as something requiring investment to facilitate learners to meet the upcoming threshold Standards.

'Good clinical practice settings, newly innovative diagnostic equipment/machinery and different varieties of diagnostic procedures [are needed].' (ID41)

Assessment

Participants' felt assessment should capture the wider aspects of what it means to be a diagnostic radiographer, not just proficiencies

related to image production, such as attributes of professionalism. There was also a desire for clear expectations of student learning outcomes by stage of learning, with clear and formal assessment criteria and training in their application so that assessments could be consistently applied.

> *'More guidance on how to assess these* [Standards of Proficiency]' (ID 78)

> *'Broken down points as to what is expected for each year of training with attached assessment criteria for end of placement module'* (ID 88)

> *'I think it would be a good idea to have yearly clinical placement assessments so that the site coordinator can assess the students' level of working according to the proficiency standards for each academic year.'* (ID 74)

Values

Participant responses indicated differing attitudes towards students and their value within the practice setting.

> *'Students who have initiative instead of a sense of being owed a living. Universities impressing on the students that this is a job therefore punctuality, professionalism, enthusiasm and a willingness to learn is required.*' (ID75)

There was a sense that neither students, or radiographers supporting their learning, were valued. This was reflected in the way students were treated, or the lack of time and support radiographers were given in their workload to support students.

> *'Trusts recognising student training as a key fact of clinical practice, not as an added burden.*' (ID72)

> *'More time, more inclination, greater empathy* [from staff to support students].' (ID 58)

Discussion

The results of the Delphi study provide illumination of the expectations of diagnostic radiographers with regards to meeting the 2023 Standards of Proficiency during the progressive stages of training and into their early career. Participants agreed that the majority of Standards should be achieved during pre-registration training, but whilst some are complex and take time to reach the threshold standard, others were expected to be achieved at earlier stages of training. Participants identified that the Standards relating to the underpinning knowledge and ability to work safely, abide by legislated practices, confidentiality, and provision of effective care and communication should be achieved by end of first year of study. This implies that respondents felt these Standards provided the foundation on which to navigate the practice environment safely and develop wider clinical skills and professional knowledge. This mirrored previously reported focus group findings where radiographers expected first year students' to be aware of underpinning principles of safe and legal practice and have communication and interpersonal skills.[28] A relatively low number of Standards were expected to be achieved at the Mid-point of Training, but indicates progression of practice is expected as these related to modification of communication and techniques to meet service user needs. The skew towards meeting the remaining Standards at The End of a Programme/Point of Qualification suggests that participants felt that learners require time across the programme to achieve these. Scaffolding of learning and practice placement experiences in these areas will still be needed throughout stages of the programme in order that students are able to demonstrate those capabilities within that timeframe. In areas, such as MR imaging, where this was perceived to be a post qualification competency, this may pose an issue in support for learners and exposure to hands on experience. This is likely linked to the cultural status of MRI being a specialist imaging area and synonymous with practice beyond a radiographer's historical mainstay of projection radiography.[19,32] The focus of placement learning to date around projection radiography image acquisition, and lack of meaningful exposure to other imaging modalities in placement has been identified in previous studies[18–20,32] but will need to change in order to enable new threshold Standards to be met, and the development of the modern, flexible and agile workforce to be achieved A mindset change may be needed within the diagnostic radiography profession around pre-registration training expectations across the different imaging modalities, and post-qualification career progression, to address the perceived service barriers in supporting this.[32]

Relatively little student exposure to wider professional experiences during practice placements currently[19,20] may explain why the Standards around management, service quality and improvement, and patient care plans were not seen to be expectations during, or at the end of, pre-registration training. Wilkinson et al.[28] also identified that some skills and knowledge around the Standards related to development, innovation, and leadership were not expected of undergraduate students. This is perhaps linked with the employers' perspective of competence which is strongly influenced by the notion of fitness for purpose, that is the skills that meet the requirements of the workplace, rather than fitness for practice and the conferment of capabilities.[1,33] Although leadership and improvement skills have become an increasingly important focus area for the NHS and all its healthcare workforce, it is often missing, disjointed or not explicit within pre-registration healthcare curricula.[34] Active learning mechanisms and the assessment of leadership skills, attributes and knowledge throughout a programme and in practice have been advocated as helpful in developing as a leader.[35] However, support for mentors and practice assessors may be needed to help students learn and achieve leadership skills and behaviours.[34]

Whilst the HCPC have publicised the revised Standards and created a gap analysis for registrants,[36] it is evident from the findings of this study that the radiography workforce feels unprepared to support this step change in the Standards of Proficiency, both in terms of what it means for themselves as practitioners and in supporting and assessing the progress of learners. The need for guidance, support and training, particularly from the HCPC, managers and education providers, demonstrates the lack of clarity within the profession of what this change looks like.[28] The potential for different interpretations of the Standards, and thus variation in the diagnostic radiography graduate, is perhaps greater than with the 2013 Standards which have remained static and familiar over a considerable period of time. This also has implications for preceptorship, which is already reported by some as the default in equipping graduates to work within their scope of practice in a given clinical setting.[1]

UK diagnostic radiography programmes are at liberty to implement unique practice assessments and organise curriculum content across the stages of the programme in the order they see appropriate. This variation, while beneficial for educational organisations in promoting and marketing the unique selling points of their programme, makes it challenging for practice placements to support students studying on different programmes. Comparison between students studying different programmes may occur, and those

supporting practice learning may be influenced by their own training and experience in determining expectations of learners at stages within their training, such as the ability to communicate with patients and act in a professional manner early in their training.[26,28] The consensus determined in this Delphi study could support the development of assessment strategies, informing the expectations of leaners by stage of training, and a more holistic capture of broader Standards within assessment models, as called for by the participants. The Society of Radiographers has advocated for standardised practice placement assessment to be explored by UK education providers as a means of innovation in practice placements and facilitating expansion in capacity.[37] Though standardised assessment has been achieved in other health care professions,[38,39] it comes with challenges and may not be accepted by education providers wanting to maintain the unique differences of their programme in an arena of increasing competition. Inconsistencies in supporting appropriate practice placement learning can impact students' development and achievement of learning outcomes.[40] For those radiographers in practice, particularly in areas which have traditionally provided limited practice placements, the Delphi results could be used to support stage appropriate learning activities developing towards threshold competence.

The reported high vacancy and attrition rate,[41] and the demands on staff and service at a time when the numbers of diagnostic radiographers in training are expanding,[5,6] was also raised as a cause concern impacting on student learning in this Delphi. While there was a call for reduced student numbers within participant responses, this will only exacerbate radiography staffing issues and will not address the increasing demand for radiographers in the workforce which has resulted in the push for higher radiographer student numbers. In addition, negativity around learners, and that they, and role of supporting learning in practice are not valued, is a concern and has been reported elsewhere. The need for more staff resource and time to support learning, including protected roles, was seen as a priority in the Delphi. NHS England sees the educator workforce as a core consideration in integrated workforce and service planning, and that educator time and resource must be established and protected with clear job roles developed.[42] The Allied Health Professions (AHP) Educator Career Framework has been developed to outline the knowledge skills and behaviours required to effectively support AHP education and practice, with the underpinning premise that education is a pillar of AHP professional practice thus every professional's responsibility.[11,43] This must be recognised and supported through employers if education and learners are to be valued.

Limitations

As this study formed part of a time bound funded project, a third round of the survey was not undertaken, and it is unknown whether consensus on any of the 39 remaining statements could have been achieved. Delphi studies have many advantages in gaining expert opinion around concepts, however it should be noted that over time, participants can change their minds, and this may reduce validity.[44] This is something to consider especially as more information and knowledge is being shared surrounding the updated 2023 HCPC Standards of Proficiency. Whilst the Delphi indicates the stage at which participants agreed the Standards should be met, it did not explore how or where achievement of the Standards could or should be assessed.

Conclusion

Despite the publication of the 2023 HCPC Standards of Proficiency prior to implementation, there appears to be a lack of clarity around these and the implications for learning and assessment. Concerns around the ability to provide appropriate resources, support, and expertise to enable learners to meet the Standards have been raised. The expectations of diagnostic radiography students and apprentices is deemed too high, particularly with concerns over the amount of practice placement hours and the number of learners impacting on the quality of the learning. Further guidance and training around the assessment of students against the new Standards was also identified. However, encouragingly, agreement of when three quarters of the Standards would be expected to be met during pre-registration training could support identification of appropriate practice placements/activities across different stages of learning and inform assessment expectations.

Implications for practice

Whilst there is no national curriculum or common assessment for UK diagnostic radiography education, the findings of this Delphi, and the consensus of expectations, could inform stage appropriate learning opportunities, outcomes and assessment in programmes aligned to the 2023 HCPC Standards. However, there is further work to do in re-framing the profession's expectations of what the role of the future diagnostic radiographer is to facilitate wider learning experiences, support leaners in meeting the appropriate standards, and produce graduates fit for modern service delivery. The need to resource, value and support the training of our future workforce must also be a priority for the diagnostic radiography profession if we are to see the vacancy rates fall and the provision of quality services for patients.

Funding statement

This work was funded by NHS England Workforce, Training and Education North East and Yorkshire.

Conflict of interest statement

None.

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