

*Review of Clinical Skills and Simulation
Technicians/Technologists in the UK:
Results of a Survey-Based Study*

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Introduction

In 2013, a national survey and subsequent report¹ was requested by the Modernising Scientific Careers (MSC) programme team to clarify the current situation of Clinical Skills and Simulation Technicians in the United Kingdom. Although, the online survey was to primarily gather evidence for justification to include the role of the Clinical Skills and Simulation Technician as part of their healthcare science apprenticeship educational framework (CF) 2-4, the results provided a valuable insight as to the background, roles and training needs of a still relatively unrecognised but skilled technical workforce.

Background

The aforementioned survey highlighted the generic skills that Clinical Skills and Simulation Technicians needed to ensure sustainability and future proofing of healthcare learning environments that included e-learning, simulation and other mobile technologies. However, the most significant result was a general lack of availability or access to relevant, quality training which was impacting on both personal development and career progression.

In the last 3 years, progress has been made towards better recognition of the role with increased engagement and networking of Technicians across the UK and beyond, but development of needs specific training or courses, standards and professional registration continues to be work in progress.

Some key initiatives have already contributed to the growth and development of the role; others will do so in the very near future:

1. A funded pilot of the first clinical skills and simulation technician apprenticeship in the Yorkshire and Humber region
2. The launch of the role of regional TECH Champions² supported by the Association of Simulated Practice in Healthcare (ASPiH)
3. The development of groups/networks facilitating provision of training and events, for example, the *ScotSimTech* training days
4. The growth in status and impact of the TECH Room at the annual ASPiH Conference
5. The joint ASPiH-SimGHOSTS conference in 2015 (Leeds) and 2016 (London)
6. New relationships with professional membership organisations to help support the training needs and move towards professional registration for skills and simulation technicians

¹ Nicklin J 2013 Clinical Skills and Simulation Technicians in the United Kingdom – the current situation https://static.onlinesurveys.ac.uk/media/account/331/survey/181069/question/national_report-clinical_skill.pdf (Accessed 22/03/16)

² <http://www.aspih.org.uk/regional/tech/champs/> (Accessed 02/08/16)

Purpose

The key objectives of the 2016 survey was to:

- identify any specific changes in the expectation of the role and responsibilities
- update the facts and figures from the 2013 data on skills and knowledge requirements
- identify the training opportunities now and for the future
- clarify and analyse the increasing challenges that technicians face in their daily work activities
- assess the impact and the potential of professional registration
- use as an indicator of the importance and relevance of the ASPIH standards for simulation based education
- provide valuable evidence to source additional support, resources and funding from industry, national organisation and groups.

It is from these objectives and subsequent findings that specific recommendations will be proposed, these will not only clarify what is *still* required to support and progress the role, but also the what, who and where to ensure they are achieved.

Methodology

A short questionnaire using the Bristol Online Survey tool was developed (Appendix A) and the link forwarded to known skills and simulation technicians in both Trust and University facilities through the Regional TECH Champions networks; further distribution and awareness of the survey was communicated through the ASPIH website and social media i.e. Twitter. For this reason, numbers of simulation technicians reached is difficult to estimate, however it was felt that responses were a satisfactory representative sample and sufficient for the purpose of the review.

61 responses were recorded.

The main body of the questionnaire was comparable to the 2013 survey but additional questions targeted the differing objectives for this review of the 2016 data. Participants were urged to complete not only to aid the comparison to the earlier survey but to highlight the predicted still unmet need for training and professional development.

Analysis of findings

Of the sixty-one simulation technicians who completed the survey, 39 out of the 61 used the descriptor of technician, technical or technologists in their title with differing backgrounds spanning clinical and non-clinical, with over half coming from a non - clinical setting.

Nursing was the most common professional clinical background, with audio visual/information technology leading the non-clinical participants of the survey. Only 11.5% declared holding a formal teaching qualification, for example PTTLS, ENB998 or PGCE

Question 3 asked *where in the United Kingdom they were located?* Participation from across the United Kingdom was not 100% but deemed sufficient for the purpose of the survey as responses were recorded from Scotland, Wales and Northern Ireland and *all but one* of the 13 LETB regions in England.

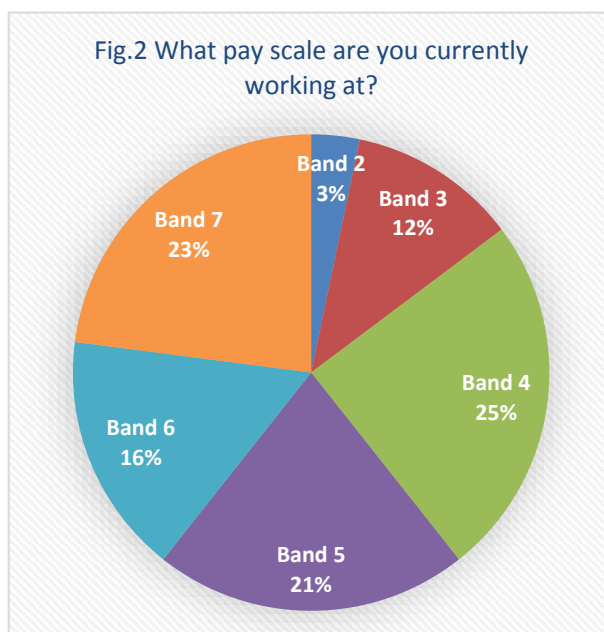
Sixty percent were employed in NHS Trust facilities with one person working freelance nationally (Fig.1)

Fig.1 Whereabouts in the UK are you located? Select your HEE region or country	Trust	University	Total
Yorkshire and the Humber	6	2	8
East Midlands	6	1	7
North West	3	2	5
North East	1	0	1
West Midlands	3	2	5
East of England	2	1	3
Thames Valley	2	3	5
South West	5	2	7
Wessex	3	1	4
Kent, Surrey and Sussex	1	0	1
North West London	1	0	1
South London	1	0	1
North Central and East London	0	0	0
Scotland	2	6	8
Ireland	0	2	2
Wales	1	1	2
	Freelance		1
Totals	37	23	61

Enquiry as to pay scale and/or banding (Fig.2) revealed that the majority of respondents were working at Band 4 level in both NHS Trusts and Universities, however, *NO* technicians were working at either Band 2 or 3 in a University skills and simulation facility.

The higher banded posts i.e. 6 and 7 were associated with a clinical background, mainly nursing or operating department practitioner and were notably working in trust facilities.

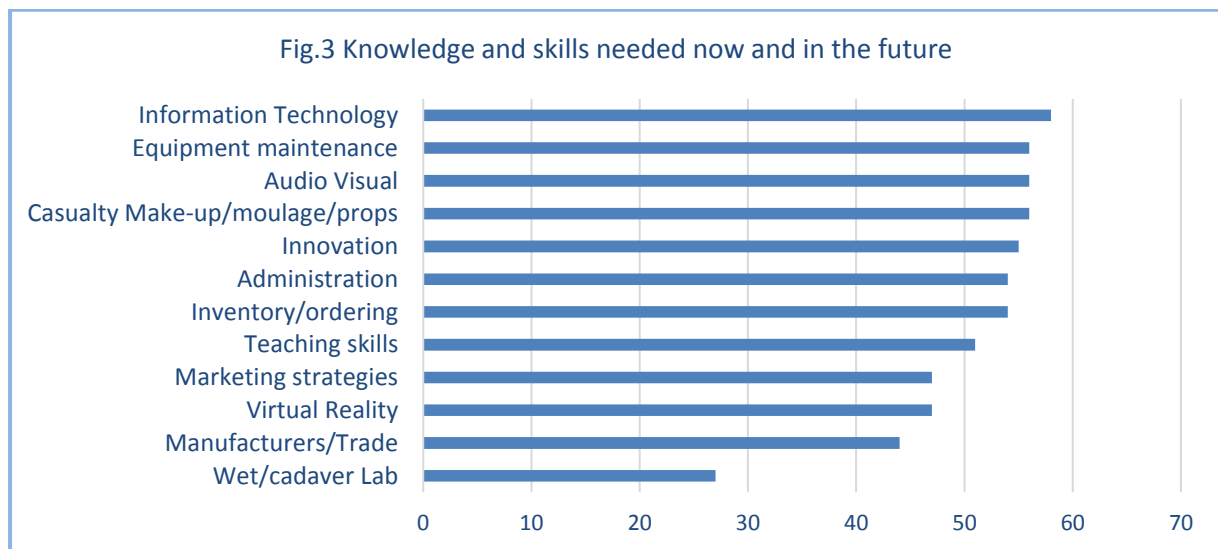
The latter finding supports the thinking that clinicians moving into a different role within a Trust would usually maintain their banding, whereas university support staff roles are generally middle-grade, regardless of a clinical



or non-clinical background. However, it is useful to remember that when comparing pay scales/spines, a top band 5 in a Trust would be comparative to a low band 6 in a University.

Question 4 asked technicians to - *Consider and annotate against 12 skills and/or knowledge that they currently use to carry out their role, those that they considered they would need more support to provide in the future and those that they did not require*

Despite three more relevant skills being added to the 2016 survey i.e. innovation, virtual reality and marketing strategies, the findings of the 2016 survey (Fig.3) showed comparative data to 2013 regarding the nine original skills. However, there was a significant increase in need for teaching skills, up from 34% to 83% with some technicians expressing a desire to be more involved with staff training, train the trainer courses, practical teaching and faculty development. 90 percent of these responses came from technicians working in NHS Trusts



Innovation scored the highest of the three skills added for 2016, a combined score of 82 on the needs analysis i.e. needing the skills and knowledge now and in the future. This was in third position behind moulage/special effects (88) and information technology (83). Yet, this high score is not replicated in any of the questions that followed regarding training opportunities or challenges; there is minimal mention of new product development, inventions or adaptations that we know are part of technician’s everyday activities in their centres.

Knowledge and skills of information technology and equipment maintenance (Fig.4) were ranked as the two top highest requirements, with wet lab/cadaveric work considerably lower down in the training needs (Fig.5)

Fig.4 Equipment maintenance
56 out of 61 needed more support and training NOW
22 of those felt they would need on-going support and more training for the future
No correlation between trust or university based or background

Fig.5 Wet lab/cadaveric work

27 out of 61 either needed more support and training NOW or in the very near future

34 did not require this skill

All those needing the skill NOW are working in Trust facilities

A third of the 61 respondents identified other *skills gaps*, these are themed below:

- Basic anatomy and physiology, medical/clinical information/terminologies, clinical knowledge and experience, awareness of differing professions/roles etc.
- Project management, research and academic projects
- Business administration, finance, service provision and improvement
- Medical equipment/devices, manual handling/transport of equipment, hazardous materials, first aid, fire warden responsibilities
- Training the trainers (using software, setting the scene, storyboards, debriefing)
- Acting skills

Question 5 asked *what would be the top 5 learning opportunities or educational programs you would want to access to improve the work that you do?* A free text box was provided for responses, this resulted in a wide-ranging variety of responses, common themes are grouped below in no order of priority or occurrence:

- IT skills – programming, databases, software, hardware
- Equipment/manikin maintenance - from basic to advanced including trouble-shooting
- Moulage - from basic to advanced, including casting, overlays etc.
- Teaching skills and/or qualification – Twenty percent listed gaining a teaching qualification as one of their top five priorities.
- Audio Visual skills - knowledge of video equipment, film editing
- Simulation – certification, qualification, course design
- Networking – training events, conference hosting, attending or coordinating

It is not surprising that there is a substantial connection between the directed question of No.4 and the free-text responses of question No.5, this duplication only demonstrates the overall unmet need of specific skill-sets. The visual representation of word frequency from the answers to question 5 are contained in the word cloud in Fig.6



Fig.6

The penultimate question - *What are the key challenges that you face with the setting up, delivery and evaluation of skills and simulation sessions?*

Nearly 25% of technicians noted faculty as one of their daily challenges across both Trusts and Universities, the main issue in Trust facilities seems to be the availability, the release and the quality and skills of clinical staff to coordinate and run simulation sessions. In universities it is the lack of engagement, knowledge or *interest* in simulation based education that adds to the technician's daily challenges and unfortunately the lack of respect that is shown for those in a technical role when working with some faculty members.

'trying to get teaching staff to use technology' and a *'lack of teaching staff's understanding of technical staff's importance in the planning stages'*

'There is a clear divide between my role as a technical officer and the lecturers'

10 out of the 61 specified *space* as an issue; this for the majority was referring to the amount of equipment v storage space

Just short of 40% stated *time* as one of their biggest challenges, this could be broken down further as not enough hours in the day, insufficient time to test networks, expectation of quick turnarounds and set up times, no time factored in to troubleshoot problems and no dedicated time to maintain equipment. Sometimes, these issues were only compounded by;

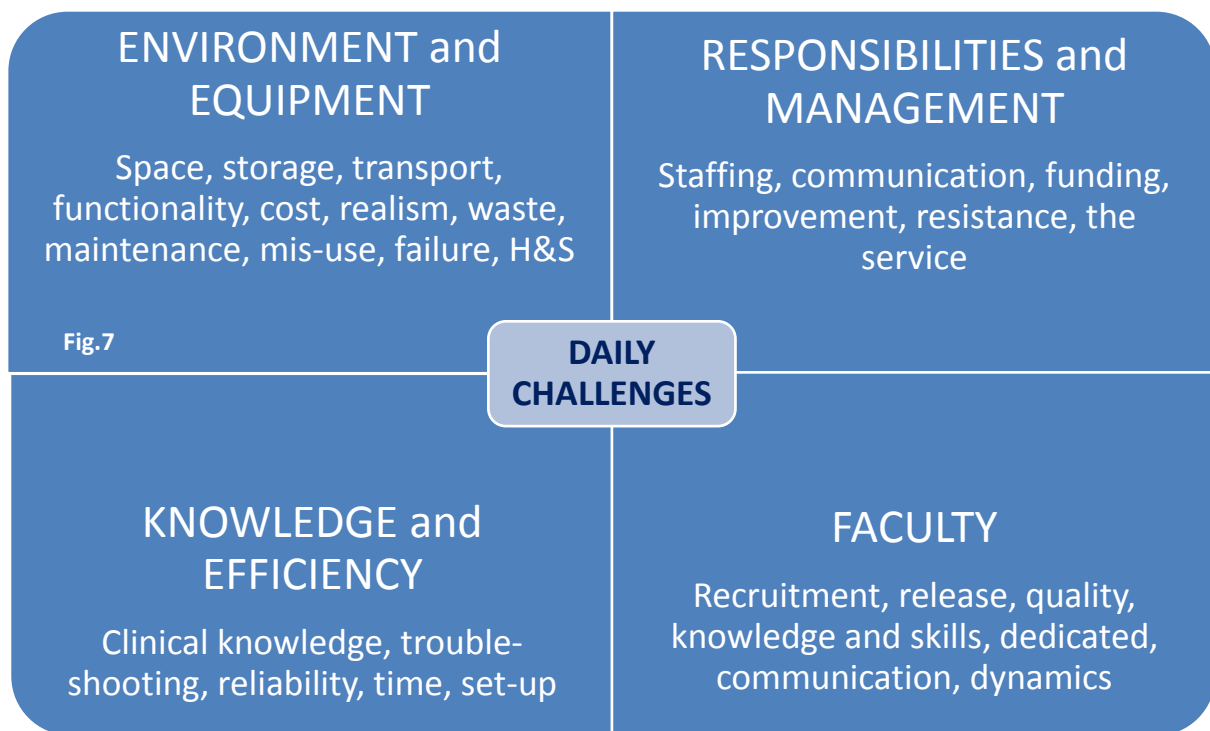
'Not knowing the function of all the equipment and having limited clinical knowledge to set-up for skills'

Over 25% responses referred to staffing levels, skill mix and mismatch of communication between staff as to requirements for courses all contributing to their daily challenges

It is evident from these responses that technicians are fully aware of the issues and challenges in their service provision but are not always in a position or recognised as having the right skills to coordinate or manage teams, either within or outside of their departments to help improve efficiency and productivity.

‘No control over bookings - oversubscribed - quantity over quality’

The free text responses were grouped under four main issues to help classification and future work on providing possible solutions and strategies; Equipment and the environment, management responsibilities, knowledge and efficiency and Faculty (Fig.7)



Finally, respondents to the survey were asked - *What value would you place on undertaking a formal approved faculty development program for technicians?*

Ninety-three percent of respondents placed a medium to high value on undertaking formal training and/or accessing a development program for technicians. Further remarks stressed a real need and importance of recognition and standardisation of the role, validation of people’s expertise and experience and a shared aspiration to be a member of a professional body and have access to an appropriate qualification in the very near future.

The majority felt that any development opportunities needed to be tech-specific but cover all *clinical skills* provision - not just high fidelity simulation and scenarios and not be delivered as a small section within a ‘*faculty development*’ course.

These are all candid, yet typical comments representing how strongly technicians feel about their role; despite their passion for what they do and deliver on, not having a clear development pathway or any recognition as a *true professional* is viewed not only as a real hindrance to their work activity and career progression, but impacts noticeably, on their status in their department or facility.

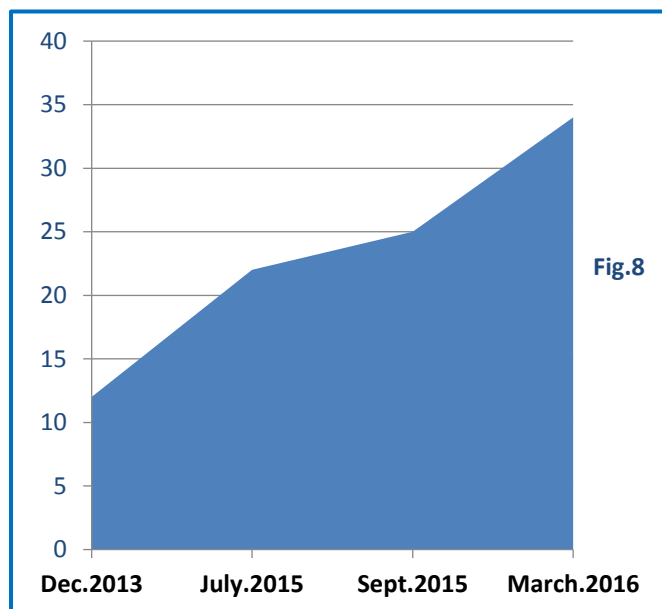
Discussion

The only significant change in information on banding/pay scales from the 2013 survey was, as mentioned in the analysis, no respondents were working at Bands 2 and 3 in Universities and the percentage at Band 4 was 16% compared with an overall total percentage of 44% at Bands 2-4 in 2013. This is an indication that the role and content of the job descriptions and person specifications have theoretically moved up the nationally evaluated profiles of the NHS and Higher Education Institutions (HEI) and their respective schemes; the NHS Job Evaluation scheme and Higher Education Role Analysis (HERA) Some early work has already been undertaken³ to support simulation technicians to better understand the systems and processes by engaging with management and HR departments. This is possibly an area that needs further investigation and clarification.

There is an interesting correlation between the regions/countries and the number of responses, the top responders identified in Fig.3 i.e. Scotland and Yorkshire and the Humber are areas where engagement of technicians has been driven by certain individuals/groups, on some occasions accompanied by funding, but resulting in active networks, related projects and events and provision of training.

From December 2013 to March 2016 In the Yorkshire and the Humber region alone, the number of skills and simulation technicians working in NHS organisations and HEIs has trebled.⁴ (Fig.8)

Similar activity, increasing recognition for the role and the skills that technicians can bring, coupled with a genuine need has resulted in a marked rise in job opportunities in certain areas. Both NHS Jobs and jobs.ac.uk are regularly advertising a variety of skills and simulation/technical support roles, including simulation technician Apprenticeships.



³ Gay C and Riby S 2015 Improving Your Job Description (p.16) http://www.simghosts.org/images/sim/old-website/Files/Event%20Brochures/SimGHOSTS_BROCHURE_Version_C_UK_Europe_Compressed.pdf (Accessed 20/08/16)

⁴ Wilkinson D. (2016) *Clinical Skills in Yorkshire and the Humber* PowerPoint presentation, Health Education England. Yorkshire and the Humber.

The need for teaching skills and/or qualification is consistent throughout the survey responses. The majority of technicians teach and/or mentor informally as part of their role, either demonstrating functionality and how the equipment/kit works or supporting the user.

Do technicians feel that by holding a recognised teaching qualification would improve their capability to share and demonstrate their skills and expertise? Perhaps, increase their confidence of their own abilities? Or would it help to justify their position as a legitimate faculty member, above and beyond their technical and supporting role.

Free text responses point to a combination of all three, but it is worth taking into consideration the subtle language difference between *faculty* in an NHS Trust and *faculty* in a University and the differing challenges it brings for the technician. Whilst NHS simulation faculty are usually a group of speciality experts, simulation focussed enthusiasts who come together or work as individuals to support programmes, scenarios and course, their technical expertise and knowledge of the equipment may be limited.

In universities, academic are referred to as faculty, their subject specific expertise is usually clearly defined but whether they use simulation or other learning technologies and equipment in their teaching is not. The Dearing report⁵ found that students in universities place increasing demands on support/technical staff to provide them with advice and guidance, these staff reported a growing involvement in learning and teaching functions, for example, training students how to use equipment and '*teaching students how to learn*' was one previously seen as being the academics responsibility.

The division between the academic and the technical supporting roles in Universities is notorious; not just in daily work activity, but pay scale and status implications. If technicians are ever going to be recognised as a valued member of faculty, then achieving professional registration and/or a teaching qualification could be one of the solutions.

The key skills identified and other outcomes from this study are not dissimilar to those identified in a survey-based study done in 2015 in the United States⁶ which identified five core tasks that simulation technicians assigned as their primary role: equipment setup and breakdown, programming scenarios into software, operation of software during simulations, audiovisual (AV) support, and on-site simulation maintenance. This is reassuring that the US and UK are needing similar skills, however their training offering has progressed more rapidly. SimGHOSTS, aka The Gathering Of Healthcare Simulation Technology Specialists launching its first online training courses in early 2016, that are available at a cost to their international subscribed community.⁷

When evaluating the responses from the skills that UK technicians still require, the comparative data from the national 2013 survey was slightly skewed due to introducing three more skills; innovation, marketing and virtual reality (VR), the latter was added not only because of the increased commercial availability of programs and VR environments, but the expectation of faculty and managers, that skills and simulation technician would be up to speed with all the recent developments. It should be noted

⁵ The Dearing Report (1997) Higher Education in the learning society: Main Report London: Her Majesty's Stationery Office 1997

⁶ Bailey R, Taylor RG, FitzGerald MR, Kerrey BT, LeMaster T, Geis GL. (2015) Defining the Simulation Technician Role: Results of a Survey-Based Study. *Simulation in Healthcare* Oct;10(5):283-7

⁷ http://www.simghosts.org/sim/About_Our_Courses.asp (Accessed 28/08/16)

that several skilled technicians and networks across the country are advocating the use of VR and are involved with small projects and workshops^{8 9 10}

The word cloud (Fig.6) also included acquisition of such skills as App development, 3D printing and augmented reality – it is widely anticipated that these latter two technological skills are rapidly transforming healthcare and education¹¹ and very likely to be common-place in skills and simulation centres in the near future. Training should be seen as being offered proactively rather than reactively.

Innovation scored as one of the greatest skill requirement of the three new skills added for 2016, but disappointingly any reference to research and/or innovation capability or capacity is mentioned minimally in the remainder of the survey results. However, this probably reflects and links to one of their biggest challenges.....TIME. Unfortunately, it seems that any such developments, collaborative working with industry and future commercialization is still being lost within busy, '*not your job*' departments¹² The HEE Research and Innovation Strategy¹³ advocates developing a flexible workforce that embraces research and innovation, the technical workforce need to be collaborating and communicating more effectively with this programme/framework and contributing to the proposed hub of evidence based research and innovation.

It is quite evident from responses to several of the questions that the art of moulage and creation of special effects is becoming an expected everyday practice for the majority of the simulation technicians. Although, formal training was acknowledged as a need; most are bridging this educational gap by self-directed learning.

Some of the skills highlighted as required in the 2013 survey have already been offered as full and half-day courses by a partnership agreement between a Northern University and HEaTED¹⁴ a professional development organisation for technicians. Basic and advanced moulage, medical terminology for the non-clinical technician, setting up of a wet lab and introduction to the operating theatre have been available to book since early 2016, prices ranging from £75 to £150. Unfortunately, due to a combination of logistics, cost and release of staff to attend - *none* of the courses have yet been delivered. Suggestions have been made that some of the courses, for example, medical terminology could be delivered online, this is an interesting solution and probably one that should be pursued.

⁸ TEL News July 2016

<https://worldspanmedia.s3.amazonaws.com/media/aspindhjango/uploads/documents/newsletter/tel-news-july-2016.pdf> (Accessed 22/08/16)

⁹ TEL News March 2016 <http://www.aspih.org.uk/static/aspindhjango/uploads/documents/newsletter/tel-news-march-2016.pdf> (Accessed 22/08/16)

¹⁰ Gay C 2016 <http://www.aspihconference.co.uk/wp-content/uploads/2016/08/ASPIH-First-Draft-Programme.pdf> (Accessed 24/08/16)

¹¹ AUGMENT - Technology trends 2016: Augmented Reality and 3D printing <http://www.augment.com/blog/technology-trends-2016-augmented-reality-and-3d-printing/> (Accessed 10/08/16)

¹² Nicklin J. 2014 Skills and Simulation Technicians: the innovators now and for the future.....(unpublished) <https://worldspanmedia.s3.amazonaws.com/media/aspindhjango/uploads/documents/publications/the-silent-innovators.pdf> (Accessed 29/08/16)

¹³ HEE Research and Innovation Strategy https://hee.nhs.uk/sites/default/files/documents/HEE_Research_and_Innovation_Strategy.pdf (Accessed 27/08/16)

¹⁴ HEaTED <https://www.stem.org.uk/heated> (Accessed 28/08/16)

An Australian eLearning faculty development package is soon to be evaluated for potential UK use, this contains generic and optional modules as online or face-to-face workshops, some modules are specific to the skills development of simulation technicians. This would be a useful acquisition.

The words '*standards, quality, approved, accredited and best practice*' have been used frequently in all of the free text responses in reference to training, faculty, programmes and facilities. Technicians are fully aware that there is a genuine need for individuals, teams and departments to comply to an '*overall standard*' so it is important that they contribute either as individuals or in their teams to the 2nd consultation of the ASPIH draft standards for simulation based education¹⁵ and help to shape the next iteration. There has never been such a greater opportunity to ensure that a standard framework and the infrastructures are in place to support the training and development of technological support personnel involved in the delivery of skills, simulation and technology enhanced learning in skills and simulation facilities.

The opportunity for professional registration with the Science Council through ASPIH will have tremendous impact on the availability of professional development opportunities, the Science Council's CPD standards learning activities,¹⁶ specifically their formal/educational professional development requires participation in training courses, conferences or scientific meetings, e-learning activities and maintaining or developing specialist skills. It is imperative that these are made readily available and accessible prior to accepting registrants i.e. skills and simulation technicians onto the Science Council registers.

Conclusion

The role and responsibilities of skills and simulation technicians is growing rapidly, the expectation still seems to be that they have the capability and capacity to plan, coordinate and run the scenarios, medium-high fidelity simulation programmes and workshops without any additional training. Neither the single technician nor those in larger teams are being given much opportunity to attend any specific technical training, usually as a result of issues with release, lack of funding or justification. There is evidence that technicians are filling their knowledge and skills gaps through self-directed learning, facilities are literally *growing their own* technical support staff, a concept that is more suitable for apprenticeship schemes than a Band 5 technician.

However, it is this self-sufficiency that could enable and support others, the regional Champions and regional networks are all in a good position to coordinate and deliver the training to their technician colleagues and faculty members.

Daily workplace challenges are frequent; many can be attributed to the frustrations and lack of motivation that technicians feel when they are undervalued. The technician in 2016 is definitely looking for more coordination/managerial development to keep abreast of not only a technological enhanced learning environment but a faster paced, both time and person, limited service!

¹⁵ 2nd consultation of the ASPIH draft standards for simulation based education (2015)

<http://www.aspih.org.uk/standards/consultation/> (Accessed 20/08/16)

¹⁶ CPD Standards: Definitions and examples of learning activities

<http://sciencecouncil.org/web/wp-content/uploads/2016/01/CPD-Learning-Activities.pdf> (Accessed 28/08/16)

Skills and simulation technicians are becoming increasingly recognised for the skills and innovative ways of working that they bring to the simulation based education arena but without the belief, backing and problem-solving strategies being more readily available they will neither have the tools, techniques or solutions to contribute to improving their service.

Nonetheless, the future is significantly brightened by the prospect of professional registration, a standard framework for simulation based education and the realisation by industry and other major groups/organisations that technicians are becoming key to the coordination of effective and productive skills and simulation facilities.

Recommendations

1. Support the commitment and expertise of our regional groups and TECH Champions to coordinate local, regional and national training and educational networking events. Develop a portfolio of specific technician-led courses and educational events that are nationally available and easily accessible.
2. Encourage a more collaborative, shared approach by our industry partners; to continue delivery of their specific product training but in addition, facilitate a more supportive model of professional development for technicians that includes problem-solving techniques and coping strategies to help address the challenges of their daily work activities and improve the workplace environment and service delivery
3. Explore the potential of the technician specific modules in the Australian eLearning faculty development package and other online opportunities for learning.
4. Facilitate a more coordinated and standardised approach to those organisations who want to recruit clinical skills and simulation apprentices
5. Explore opportunities for simulation technicians to access research and innovation funding and scholarships; potentially through national organisations and groups including industry, but also regional groups and networks.
6. For ASPiH, the future Professional body organisation for skills and simulation technician, to provide guidance and support for their members to apply for professional registration with the Science Council (awaiting final approval)
7. Ensure that the relevant content of the ASPiH national Standards Framework for SBE is appropriate and sufficiently comprehensive to uphold the standards expected of skills and simulation technicians, faculty, and management.
8. Explore the potential of a national project to further investigate the job profiling of the technical workforce in skills and simulation centres.

APPENDIX A - SURVEY QUESTIONS

1. Please specify your current role and/or title:

1.a. What is your background, do you have already have a professional qualification?

1.b. What pay scale/banding are you currently working at?

2. Do you work in an NHS Trust or a University facility?

2.a. If you selected other, please specify

2.b. For which professions does your facility provide clinical skills and/or simulation training?

2.c. If you selected other, please specify

3. Whereabouts in the UK are you situated? Please select your HEE region or country from the list below, if you are unsure state your place of work

3.a. If you selected Other, please specify:

4. Consider and annotate the skills and knowledge that you currently use to carry out your role, those that you consider you will need more support to provide in the future and those that you do not require

4.1. Administration

4.2. Audio Visual

4.3. Casualty Make-up/moulage/props

4.4. Equipment maintenance

4.5. Innovation

4.6. Information Technology

4.7. Inventory/ordering

4.8. Marketing strategies

4.9. Manufacturers/Trade

4.10. Teaching skills

4.11. Virtual Reality

4.12. Wet/cadaver Lab

4.a. Any other skills/knowledge gaps? Please specify

5. What are your top 5 learning opportunities or educational programs you would want to access to improve the work that you do?

6. What are the key challenges that you face with the setting up, delivery and evaluation of skills and simulation sessions?

6.a. What value would you place on undertaking a formal approved faculty development program for technicians?

6.b. Have you any additional comments/thoughts that would contribute to supporting the development of clinical skills and simulation technicians?