Health Education England

Blended learning for pre-registration and undergraduate healthcare professional education

2022

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Ministerial Foreword

As the Minister of State for Health leading on NHS workforce, it is a privilege to be able to support the use of blended learning approaches in educating, continuous learning and upskilling of our fantastic NHS staff.

In the time that I've been a minister here at the Department, I'm always struck by the innovation that colleagues continually bring forward and embed in their day-to-day caring roles and ongoing training. I'm immensely proud of the work that HEE has been leading to develop innovative approaches to training the NHS workforce of the future, such as blended learning. I see this ongoing development as vital to ensuring that we fulfil our ambitions for the NHS workforce, and in a way that works for that workforce. We have come a long way, but there is so much further we can go.

We have seen rapid changes to healthcare delivery and healthcare education in recent years, particularly in response to the pandemic, but also to meet the changing demands and needs of students and patients.

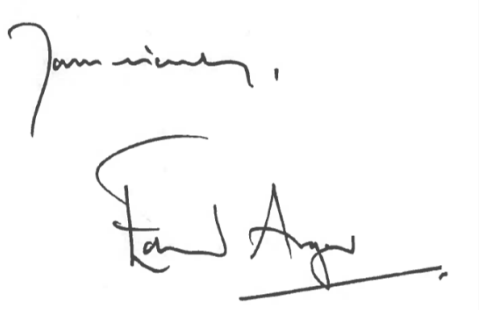
This report outlines the potential for blended learning to improve learning outcomes and student engagement and experience, to help create a new cadre of skilled and motivated professionals to join our NHS workforce.

In line with our commitment to expanding opportunities across the country, the report sets out the potential role of blended learning for those students in England currently unable to access healthcare pre-registration qualifications easily, such as those living in remote, rural or coastal communities. It also highlights the potential of blended learning programmes to allow students to access learning opportunities flexibly to further their career aspirations alongside their work, family and personal commitments.

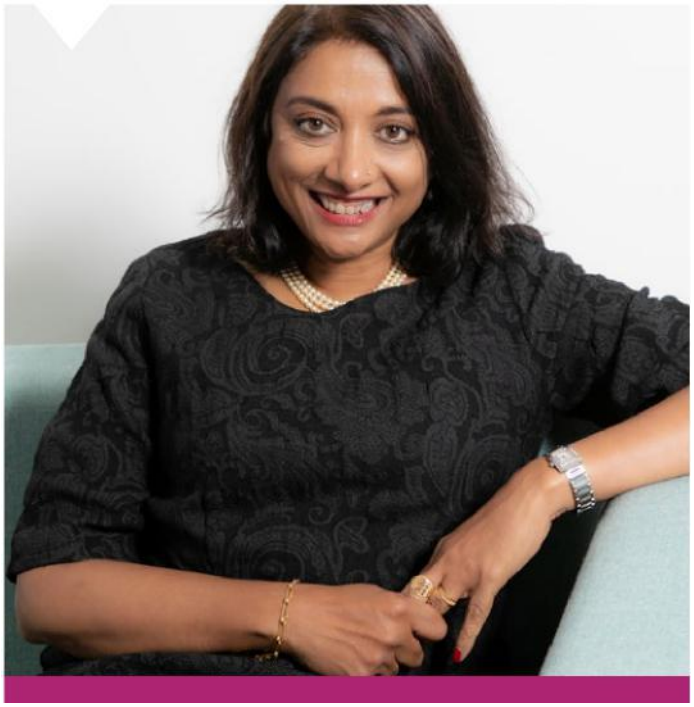
Finally, and building on recent experiences in the pandemic, the report demonstrates where and how we can go further with blended learning with appropriate flexible regulation, targeted investment, and greater use of innovative and emerging technologies.

I would like to extend my thanks to Health Education England colleagues and to all those who participated in the development of this important report.

I look forward to continuing to take an active role in further discussions with system partners - to agree a plan on implementing the recommendations from this report and to continue to promote the demonstrable benefits of blended learning for health professional education.



Edward Argar MP
Minister of State for Health



Foreword – Dr Navina Evans, Chief Executive, Health Education England

The provision of healthcare education has evolved rapidly over the past two years, in part as a response to the COVID-19 pandemic. However, even before the pandemic, a variety of factors were driving the need to change, including shortages in the healthcare workforce and issues with widening access, participation and diversity. Also pressing is the need to grow a digitally ready workforce so that we are ready and able to fully utilise current and emerging digital and learning technologies for the benefit of the population.

Health Education England (HEE) was mandated in 2019/2020 to promote alternative routes into the nursing profession by establishing a blended learning nursing degree programme, combining digital, face-to-face and practical learning, that maximises the opportunities to provide a fully interactive and innovative programme.

The emerging reviews of the few commissioned programmes are showing promising benefits in terms of diversity of student population, student satisfaction and more. However, we will continue to evaluate the approach to ensure that it delivers quality healthcare professional education, makes an impact and adds value.

Due to the pandemic, the blended learning approach has sparked a great deal of interest and a real need to utilise this approach across all healthcare professional education.

This document has been developed through the engagement of system partners with a broad range of expertise, which has helped us to frame the current state of blended learning and the potential it has to inform the delivery of healthcare professional education and training in the future.

We will continue to utilise our expertise within HEE and the wider system to promote the blended learning agenda, and to facilitate the creation of a significantly different offer in healthcare professional education. This will ultimately support the growth of an adaptive, expert and professional workforce which is prepared for the demands of 21st century care, and I am proud that these programmes will be here to benefit both our learners and the population of England as we look to the future.

Executive summary - Patrick Mitchell, Director of Innovation, Digital and Transformation, Health Education England

Health Education England (HEE) supports the delivery of excellent healthcare and health improvement to the patients and public of England; by ensuring that the workforce of today and the future have the right skills, values and behaviours at the right time and in the right place HEE's work includes planning and commissioning,

workforce redesign and reform in partnership with various system partners, regulators, professional bodies, councils and others, to ensure that the healthcare workforce receives the best education and training to deliver safe, quality and contemporary care.

Blended learning approaches have been used in varying levels to educate healthcare professionals, however, following the commissioning of the fully integrated blended learning nursing programme, there has been a surge in interest in its use for other healthcare professional education training due to the pandemic.

This resulted in HEE gaining support from Care Minister Helen Whately MP to convene a Task and Finish group with regulators and other partners to:

- explore and understand the drivers and issues in moving the blended learning agenda forward
- explore good practice from an international perspective
- explore how changes to regulation may release new opportunities to develop blended learning programmes

This report presents the current positions of regulators and key stakeholders with consideration for how blended learning can promote accessibility, diversity and inclusivity. There is a focus on how learning and support technologies can be identified and utilised effectively in the delivery of digital and online education.

It provides the reader with an opportunity to examine regulatory, technological, accessibility, diversity and inclusion issues in relation to investment, development and delivery of blended learning healthcare programmes.

While some regulators and professional bodies have limited or no restrictions to the amount and use of emerging and innovative technologies in the delivery of healthcare education, others have restrictions which we hope will be reviewed in conjunction with evidence, to release new opportunities for the development of innovative blended learning programmes.

There is evidence that blended learning has benefits including, low non-continuation rates, better student experience and satisfaction, skills development and confidence.

This knowledge provides the opportunity to examine how blended learning approaches can be utilised in providing robust and suitable healthcare professional education in the current era.

The higher education sector has responded flexibly to the COVID-19 pandemic and deployed different teaching and learning pedagogies considering social distancing requirements. More widely, the pandemic has provided an opportunity for educators, commissioners, and the government to examine the role of increased digital and online education to complement face-to-face and practice learning in developing the future healthcare workforce.

Successful delivery of these programmes is not without challenges such as:

- significant financial investment and resources
- change in perception of the delivery methods being second rated
- development of faculty and practice educators to deliver digital and online education
- an appropriate level of digital literacy skills to allow students to fully engage with education
- an appropriate level of learner readiness to engage with online/blended delivery
- investment in the technologies that deliver the right outcomes for students
- access to the right equipment, software and infrastructure by students from low participation areas, with learning needs or from rural and remote areas
- strong leadership and a shift in culture

Recommendations will be made for readers to explore contributions to development and delivery of high quality blended learning healthcare education.

HEE will continue to utilise its internal Technology Enhanced Learning (TEL) expertise and collaborate with key stakeholders, including industry and international partners, to examine the evidence and identify where changes are required to enable effective use of the approach.

It will continue to engage closely with key system partners in responding to challenges to ensure that opportunities to utilise blended learning have been fully exploited.

1. Introduction

The report was developed with the support of a Task and Finish group with regulators and other key stakeholders.

It has been informed by bilateral discussions with regulatory and professional bodies and councils to understand current use of blended learning approaches in delivering healthcare professional education and plans for potential changes to current positions post pandemic. Also, the potential for changes to regulation releasing new opportunities to develop blended learning healthcare programmes further.

A series of literature reviews were conducted with additional insights gained from an international knowledge exchange project to provide evidence for consideration by the various system partners.

It has considered how digital, emerging technologies and simulation can be utilised as part of a blended learning approach to deliver effective healthcare professional education.

It has also examined various contextual factors to understand the drivers and issues impacting on the use of blended learning approaches.

Consideration has been given to how the use of blended learning approaches can widen access and participation and promote diversity and inclusion.

There are various definitions of blended learning. For this report, we have used this broad definition, ***"a method of teaching that integrates technology and digital media with traditional instructor-led classroom activities, giving students more flexibility to customise their learning experiences"[1].*** For health professional education, practice learning is a key component and the balance of in-person delivery and delivery in a digital environment can vary widely, with regulatory and professional standards requirements to determine practice learning in a digital environment.

Background and context

Utilisation of digital, emerging technologies and simulation in the delivery of healthcare professional education is evolving rapidly, with recent acceleration due to the COVID-19 pandemic.

The change has been embraced by educators and learners, however, it has raised challenges and questions about its widespread deployment

and the implications of this. There are regulatory constraints and, in some professions, evidence to support effective use is patchy.

Flexibility of online learning can facilitate wider access to higher education by different groups, however, attention needs to be given to building inclusivity in the overall approach to avoid some people who suffer from digital exclusion being unable to access these opportunities.[2]

The use of blended learning in the delivery of healthcare professional education is not a novel idea, however, it has received a lot of attention recently with consideration for wider use in pre-registration and undergraduate education. The successful and effective use of blended learning in healthcare professional education is dependent on several factors such as:

- appropriately designed pedagogy, curriculum and assessment
- locally arranged/ brokered practice learning opportunities
- students having access to the right digital infrastructure, including internet access and appropriate study space
- staff and students having access to the right tools and resources to build the digital skills necessary to engage
- strategically harnessing technology to drive educational experience and outcomes
- inclusivity for different student groups to be considered from the outset[2]

It is imperative that we build on the successful adaptations that have taken place during the COVID-19 pandemic.

Who is this report for?

This report has been developed to inform the Department of Health and Social Care about progress made in the use of blended learning for healthcare education and plans post COVID-19. It provides opportunities for individual regulators and professional bodies to explore how flexibility in standards can facilitate the use of blended learning and for councils to support their members delivering blended learning education and for all to contribute to progressing this agenda.

Also, the report offers consideration for HEE when commissioning blended learning healthcare education and for Higher Education Institutes to consider provision of effective blended learning health professionals' education and training.

It will support collaboration by various partners and guide investment in development and delivery of healthcare blended learning education.

Summary overview

- **The need, enablers and opportunities for system change:** Following the publication of the Topol Review[3], we recognise that the changing political landscape provides critical opportunities for supporting sustained innovation and harnessing investment

- **Accessibility, diversity and inclusivity of the Blended Learning Programme:** This work has considered the implications for improving access and participation. In addition, the wider impact on diversity, equality and the benefits around inclusion have been evaluated

- **The role and insights from regulators, professional bodies and membership councils:** This maps and considers the work and current thinking around blended learning by: Allied Health Professions, dentistry, healthcare, science, medicine, nursing and midwifery, pharmacy and psychological professions

- **Learning and support technologies:** The proposed solutions for use of technology in blended learning healthcare professional education programmes, based on good practice nationally and internationally are considered. Together with the technical considerations, quality and standards and how the benefits of this investment can be measured

- **Cost and funding:** Implications for investment, cost for delivery and student funding have been reviewed

- **Evaluation, recommendations and conclusion** Frameworks for evaluation are highlighted with recommendations for individual organisations and the collective system to consider

2. The need, enablers and opportunities for system change

The UK leaving the European Union (EU) provides opportunities for regulators previously governed by EU Directives 2005/36/EC to evaluate their position on the amount and use of digital and emerging technology for practice learning.

The Topol Review highlighted how flexibility and personalisation of learning should extend to the future workforce who should be able to move away from a one-size-fits-all approach[3]. Following the publication of the report, we have rapidly seen significant use of technologies in education delivery to provide flexibility and personalization – a trend that has been heavily influenced by the COVID-19 pandemic.

Digital technologies are bringing powerful changes to education delivery and systems. The increase in access to devices and communications in students' digital literacy, in private providers' development of learning environments, and in free online resources, changes the way in which students access and learn concepts and skills[4].

In the context of healthcare professional education, these drivers and enablers need to be explored alongside professional regulation and standards. Consideration should also be given to ways in which locality-based practice learning can be integrated accessibly with the digital and online learning approaches.

Despite the drivers and enablers for blended learning innovations and change, it will not happen automatically without investment, guidance and the imperative for educators, policy makers, health leaders and education ministers to promote change.[2,4]

There are relevant enablers critical for successful innovation and change which need to be strengthened: leadership support for innovation, teacher professional development, communities of practice, learning technology systems, tools and services, evaluation and research evidence and shareable resources.[4]

However, current successful innovations are localised and inconsistent across the education and healthcare system and are unsustainable. This is compounded by limited investment, and

the lack of strategic priority for developing and sustaining these innovations has minimised systemic change, though evolving. Nevertheless, recent events have presented new challenges as well as opportunities to revisit this position and utilise the learning available to us to effect systemic change[2].

The value of blending the two is that digital methods offer much greater personalisation, flexibility, inclusiveness and efficiency[5] than conventional methods can, but they have to be used appropriately. If done well, blended learning can improve student experience, reduce non-continuation rates, improve learning, and boost engagement[6].

3. Accessibility, diversity and inclusivity of the Blended Learning Programme

The programme and this report have been informed by an equality and human rights policy impact assessment. The interim conclusions of the equality and human rights impact assessment acknowledged that in developing the blended learning programme, there was active consideration around access and participation. The programme also benefitted from drawing on the insights and expertise of those with direct experience of supporting equality and inclusion. A summary of the conclusions and observations drawn from the equality impact assessment process include:

- The Blended Learning Programme was initiated with partners who had been through a rigorous assessment process. This considered their commitment to the access and participation agenda. The assessment process reflected and weighted performance around equality and inclusion. These are firm foundations to build the programme on and will enable the programme team, working closely with partners, to ensure monitoring across the protected characteristics
- Programme level consideration of good equality and inclusion data collection, through monitoring, will support development, delivery and expansion of the Blended Learning Programme. Ongoing monitoring, together with plans for evaluation, will help all partners to demonstrate due regard and compliance with the Equality Act 2010 and the public sector equality duty, as well as identify successful approaches that can be replicated and/or scaled
- Further strategic work is required to ensure that action continues to be considered, with partners, to address the historic underrepresentation and inequality experienced by disabled people. It is important to put in place systems to assure that innovation is not delivered without consideration of the impact on access and learners. This is particularly important given the known access challenges and barriers to

effective use of simulated and online learning packages that continue to exist for some students with visual and hearing impairments, as well as students living with dyslexia, dyspraxia, or attention deficit hyperactivity disorder (ADHD)

- The development of monitoring will also be required to ensure that emergent blended learning solutions do not contribute to future adverse impact, or disproportionate disadvantage for people from across the nine protected characteristics (together with non-paid family carers). In future, further thought may need to be given to adapting data classifications to measure social mobility within the context of learners engaged in blended learning and work

- The current configuration of the programme may contribute to students from remote areas, including coastal and rural communities, in future realising better opportunity for access and participation. It is important the programme includes robust mechanism to capture such benefits. This increase in opportunity would be multi-factorial, for example, the advantage of reduced costs associated with attendance at a traditional higher education institute (HEI), increased choice of providers and courses; so, it is important that methodology allows for collection of data across direct, indirect and serendipitous benefits to this socio-economic group

- The Office for Students is carrying out policy work on digital poverty. It is important that opportunities to share evidence and data are used to further shape future thinking on blended learning

- As part of the wider, long-term evaluation of the Blended Learning Programme, HEE is working with several early adopter sites to evaluate the development and implementation of the programme. The evaluation framework could be used as a tool to set out outcomes and inform and shape future updates to drive further impact in support of equality and human rights.

As the programme develops, so will the work associated with ensuring that the impact on equality, diversity and inclusion is considered. The equality impact assessment is set out in a separate document

4. Current position of the professions and regulation

Regulators and professional bodies have a central role in protecting the public by developing and promoting standards of proficiency and professional education and maintaining registers of professionals who meet the registration requirements.

4.1 Allied Health Professionals

Background

The NHS Long Term Plan (LTP)[7] and the subsequent People Plan[8] signaled the need for significant growth in numbers of AHPs for the workforce. This increase will need to be matched by equivalent expansion in the amount of practice learning required to deliver these numbers.

Practice is changing, the long called for shift to care closer to home also requires a change in the location of practice-based learning away from the acute NHS Trusts to community, domiciliary and primary care settings. In general, more needs to be done to ensure sufficient placement capacity across all settings. COVID-19 has necessitated a change in the models of delivery of care to manage workflow and keep people safe. This has led to innovative practice in terms of using online platforms to deliver care in line with the NHS England and Improvement (NHSEI) definition of Technology Enabled Care Service (TECS).

Students need to be digitally prepared to be fit for practice going forwards.

Education practice is also changing in the wake of advances in technology and blended learning and simulation are becoming commonplace in the delivery of AHP degrees. Good simulation done well is recognised as having value in preparing learners effectively so that when they enter the practice learning environment, they are better prepared and can consolidate their skills in practice rather than start from scratch.

The COVID-19 pandemic has accelerated the move to broaden and increase the use of blended learning approaches to support the progression of

students. There is now an opportunity to capitalise on these changes to:

- create innovative, accessible degree programmes to attract a more diverse student population (mature students, people from low participation areas, protected characteristics, rural and remote areas, etc.)

- provide flexibility in training with increased use of appropriate digital and other learning technologies

- develop digitally capable health professionals suited to the demands of 21st century care delivery who continue to meet the professional and regulatory standards

Regulator perspective

There are two regulators for the AHP professions – the General Osteopathic Council (GOsC) who regulate the osteopathy profession and the Health and Care Professions Council (HCPC) who regulate art therapists, drama therapists, music therapists, podiatrists, dietitians, occupational therapists, operating department practitioners, orthoptists, paramedics, physiotherapists, prosthetists/orthotists, diagnostic radiographers, therapeutic radiographers and speech and language therapists. The standards they publish mandate the requirements of education providers, however each provider has freedom to design their own programme of learning.

The Health and Care Professions Council

The HCPC Standards of Education and Training (SETS) have a framework based on outputs. Each standard is framed in a way to describe what must be achieved. HEIs as providers, have the autonomy to deliver these standards through their own curriculum design. The guidance is not designed to be prescriptive. Each HEI takes the guidance and develops their own individual curriculum in the context of the environment they are operating in, the professions they are delivering to and the relationship they have with their stakeholders. They are expected to explain and detail this at an approval event and are reviewed annually through monitoring.

Education providers are already encouraged to consider the range of teaching and learning opportunities they make available to support the delivery of their curriculum through the HCPC SETS which say, 'the structure, duration and range of practice-based learning must support the achievement of the learning outcomes and the standards of proficiency.' (SET 5.2)[9]

Simulation is currently used within professional training programmes to prepare learners to enter practice-based settings and to support the observation and assessment of practical skills in a controlled environment. Recently, there has been an increased focus on exploring opportunities for simulation to be used more widely as a suitable learning experience. The intent is to explore to what extent it could function interchangeably alongside more traditional practice-based learning experiences, rather than being viewed as an add-on.

The HCPC supports the collective effort being undertaken by workforce and employer-led organisations alongside the professional bodies to develop a new consensus in this area of simulation. Their expectations within the context of SETS remain the same; education providers must ensure the practice experience in simulation is suitable to support the achievement of programme learning outcomes.

These standards outline that learning and teaching methods used must be appropriate to the effective delivery of learning outcomes. The assessment strategy and design must ensure that those who successfully complete a programme meet the standards of proficiency for the relevant part of the register. Assessment throughout the programme must ensure that learners demonstrate they are able to meet the

expectations of professional behaviour, including the standards of conduct, performance and ethics. Assessments must also provide an objective, fair and reliable measure of learners' progression and achievement. Each education provider has overall responsibility for the delivery and quality assurance of practice learning. They are expected to do this in partnership with practice learning providers and together deliver a safe and supportive learning environment which is appropriate to deliver the learning outcomes.

The practice learning experience is expected to be integral to the delivery of the overall learning experience and must relate to the profession it is intending to educate. How this is done is up to the provider. The exact number of hours, the requirements at each progression point, and the model, range, and location of delivery are all determined by the education provider in line with any additional professional body standards or guidance. However, only HCPC standards are required to be met for provision to be approved and delivered.

Embedding suitable technology-enabled service opportunities can form part of the overall profile education providers offer going forward. The HCPC welcomes education providers seeking to innovate in this area. Importantly, education providers must be able to assure the quality of this type of practice learning in the same way as any other practice learning settings. This includes being satisfied about the arrangements for supervision and that the environment is safe and supportive for learners.

Allied health professional students do not have to be supernumerary while undertaking practice learning, nor is there any HCPC stipulation about the ratio of practice educator to student. However, some AHP professional requirements do set supervisor-student ratios that may pose a barrier to blended learning options. It is accepted that practice educators/supervisors do not always need to be registered practitioners. However, it is crucial that they can provide a safe, supportive and effective learning environment.

The HCPC's regulatory framework is designed to allow for flexibility around delivery while ensuring a consistent output. It is expected that education providers reflect current standards for pre-registration education and/or curriculum guidance from the professional bodies and Quality Assurance Agency (QAA) subject benchmark statements (where applicable). If a provider deviates from the standards, then they would be

expected to provide detailed evidence to support any innovation.

Currently, when significant changes to programmes are being considered, providers should notify the HCPC either before or after they are implemented, including any changes to practice learning based on blended learning.

Once notified the HCPC can take three actions:

1. consider the changes as part of the annual monitoring process

2. partner visitors will assess whether the programme continues to meet the standards via the submitted paperwork

3. assess the programme via an approval visit

This is an iterative process and providers are always advised to contact the HCPC when making changes for it to support and guide the process. The current change and quality assurance processes are under review and will be updated soon.

The General Osteopathic Council

The General Osteopathy Council (GOsC) set the SETS and standards of practice for osteopaths. The standards include outcomes based on five main themes.

The GOsC also provides guidance regarding the delivery of education and training as well as overarching regulation. The guidance is outcome-based with no absolute requirement about hours. However, the normal expectation is 1,000 hours across the 4-year course and that a student would see 50 separate patients in this time.

The guidance includes details of common clinical presentation and approaches to treatment that a graduate is expected to be able to manage. Each education provider has the autonomy to deliver the curriculum how they see fit to deliver practitioners who are fit to practice and therefore be registrable with the GOsC. The guidance is currently under review.

The current guidance has no specific reference to blended learning. Most osteopathic educators are currently implementing a blended approach, having moved theory teaching largely online, but retained practical teaching in class, with appropriate infection control, and similarly retained clinical provision after the initial lockdown. Providers have been asked to report on these changes, and how they assure themselves that all outcomes continue to be met, and these responses are considered by the Education Committee of the GOsC.

AHP professional body perspective

All the AHP professional bodies provide standards/guidance for HEIs in relation to curriculum and placement education. It is notable that all have given subsidiary advice about managing the student experience during the pandemic to support progression and completion.

Each of the professional bodies ensure that alongside the quality mechanisms, specific professional standards are achieved by providers. While not all produce written guidance, they all have an expectation that an appropriate registered professional will sign off the profession specific placement learning outcomes.

The HCPC is the statutory regulator of AHPs and its standards must be met by education providers to be approved to deliver AHP education in the UK. There is no requirement for AHP education programmes to be accredited by individual professional bodies.

4.2 Dentistry

Dental Education and Blended Learning Approaches

Background

The dental team in the UK is made of up of seven professional groups. Their training must meet the standards set by the General Dental Council (GDC), who also maintain the professional register to which all dental professionals within these groups register with on completion of initial training.

Although the GDC register has common standards and defines the "scope of practice" for each professional group, their training may be divided into two categories.

Dentists, dental hygienists and dental therapists

Dentists, dental hygienists and dental therapists all train full-time at universities in England. For dentists, a five-year programme is undertaken, leading to a level seven exit award (namely Bachelor of Dental Surgery). The education is delivered by the 11 dental schools in England.

For dental hygienists and dental therapists, programmes are, in the main, three years leading to a level six exit award. The actual exit award title differs between schools and there is not a uniform approach across England. All 11 dental schools provide joint dental hygienist/therapist training (although the exit award in Sheffield is a level 5 Diploma). In addition to the training delivered by the dental schools, there are standalone dental care professional schools in Teesside and Portsmouth which deliver a dental hygiene programme and a three-year full time joint bachelor's degree in dental hygiene and dental therapy respectively. In addition, Portsmouth also delivers a three-year bachelors degree in Dental Hygiene as do London South Bank University (at Eastman Dental Hospital), who also host a three year full-time joint dental hygienist/therapist degree programme. The University of Essex host a nonstandard two-year dental hygienist level five foundation degree with an additional year available to take students to bachelor's degree (level 6) in dental therapy. The University of Essex is a nonstandard programme in that the clinical activity is undertaken in general dental practice as opposed to in clinical facilities provided by the NHS to dental schools. Dental Nurses, Dental Technicians, Clinical Dental Technicians and Orthodontic Therapists are largely part-time programmes.

The University of Portsmouth offers a one-year full-time Certificate of Higher Education (exit award level 4) and, from September 2022, an additional part-time version, in Dental Nursing, inspected and accredited by the GDC. Most UK dental nurses are trained with an exit award at level 3 – there is a wide variety of training providers which are not inspected by the GDC. Their awarding bodies are, however, subject to GDC inspection. These bodies are: National Examination Board for Dental Nurses (a non-OFQUAL regulated body, thus meaning its exit award is an *award* and not a qualification), City and Guilds and NCFE (CACHE). Most training is now delivered through the dental nurse integrated apprenticeship. There are many examples of dental nurse training being delivered as a blended approach with the largest provider being London based 'Tempdent'.

Dental technology (level 5) is delivered by a small number of FE colleges and universities. Although some programmes are full time (including a new joint dental technician/clinical dental technician programme delivered by University of Central Lancashire - UCLan), most are part time. A highly successful foundation in dental technology delivered by Cardiff Metropolitan University using the blended delivery approach has been running for many years. Although based in Cardiff, the vast majority of students are from dental laboratories in England as the initial blended course was funded through the previous CDO workforce development initiative.

Clinical dental technicians

To undertake clinical dental technician training, the participant must already be a dental technician. This programme is only delivered in small numbers by UCLan, however, the exit award is by the Royal College of Surgeons of Edinburgh. Although at notional level 5, this is currently not a QA or OFQUAL approved qualification. While an apprenticeship has been agreed and funded, it is currently not being delivered.

Orthodontic therapists

Orthodontic therapist training takes the form of a notional level 4 course, currently delivered by six centres in England. To enter this training, you must be a dental nurse, a dental hygienist, dental therapist or dental technician, and work in an orthodontic environment. Although leading to GDC registration, the training is not OFQUAL approved and therefore does not lead to a formal qualification as the awarding bodies are the Royal College of Surgeons England (RCS Eng) and the RCS Edinburgh (RCS Edin).

It should be noted that the umbrella term 'dental care professional' is used as a collective term for dental nurses, dental hygienists, dental therapists, dental technicians, orthodontic therapists and clinical dental technicians.

Orthodontic therapist training also includes postgraduate training that would result in an individual gaining further qualification and/or being eligible to be registered on the GDC Specialist list.

Clinical Placements in Dentistry/ Dental Care Professionals

Clinical placements form an essential part of the training of dentists and dental care professionals, as all require significant interaction with patients to achieve the learning outcomes described by the GDC.

During their five-year educational programmes, dental students are likely to spend approximately 5,000 hours directly involved in delivering dental treatment to patients. The placements which allow students to gain this experience are delivered by a variety of models, including any combination of placements within purpose-built clinics in dental hospitals, which are often physically linked to the HEI, community clinics or primary dental care practices.

While on placement, students must work under appropriate levels of dedicated supervision by experienced clinician educators and have in place all supporting educational and clinical resources, such as dental nursing. Dental therapists and hygienists train under a similar model.

Within their educational standards, the GDC set out expectations for placements to ensure, amongst other things, that patient safety is assured. This includes an expectation that prior to undertaking clinical procedures on patients, students are required to undertake 'pre-clinical' education and training that not only embeds necessary knowledge and expected behaviours and values, but also develops clinical/surgical skills.

The development of such clinical skills is undertaken using simulation which can take two broad forms: (1) clinical simulation using purpose-built models/mannequins (often know as phantom heads) and (2) virtual reality simulation, for example, dental simulation haptics, which rely on high fidelity 360-degree computer generated images and sensory feedback. Both clinical simulators and haptic units are expensive resources typically based within training facilities within HEIs.

For postgraduate trainees, clinical education/training is often delivered as part of salaried training posts within the NHS. Other training programmes can be self-funded by students and are often aligned to master's level qualifications. The majority will have clinical placements within dental hospitals or specialist clinics where trainees receive supervision and mentoring. The supervision required will vary depending on the qualifications and prior experience of the trainee. In most situations, trainees are registered with the GDC and able to

practice independently, although needing support as they develop skills that can be considered more technically demanding and while working with more complex patients and their dental problems.

Blended Learning

Most, if not all, programmes delivering education for undergraduate and postgraduate dental professionals, within all registration categories, already include a blended learning approach involving a wide variety of formats.

Online delivery through virtual learning environments is commonplace and is particularly prevalent in parts of the courses which are aimed to deliver learning outcomes related to knowledge acquisition, application and synthesis and developing understanding.

Prior to the COVID-19 pandemic, the extent to which online learning was supported and delivered varied considerably between institutions. However, it is likely that now all institutions will have moved to the use of online teaching methods to deliver some of these outcomes.

During the height of the pandemic, this shift occurred at pace and did not have the luxury of careful and considered development. Providers are now reviewing and revisiting online delivery of learning outcomes to ensure that the opportunities afforded by a blended learning approach are now maximised. Moreover, student perceptions of online delivery of course content need to be carefully considered and an appropriate ratio of in person to online teaching must be maintained. The definition of blended learning, as opposed to some lectures in person and others online, should be negotiated and publicised so that benefits of teaching and learning in the two settings can be maximised.

Future Direction of Blended Learning in Dentistry

The enforced shift to greater reliance on online teaching has certainly made providers think again about the best way of delivering the 'non-clinical placement' elements of their programmes. As the pandemic situation has begun to ease, like the wider university sector, most dental schools have not immediately resumed their previous curriculum model.

In terms of clinical placements, however, the situation is more challenging, as demonstrated by the significant disruption of clinical training during the pandemic. Clinical training for dentists, hygienists and therapists was completely stopped during the first wave of the COVID-19, when all non-urgent dental care was suspended. Schools and HEIs resumed clinical activity at different times during the pandemic due to local factors and differences in national guidelines. The impact of this on student progression has been, and will continue to be, significant over the coming months and years. For example, education providers could not deliver the GDCs expected learning outcomes without having access to clinical placements where students deliver hands-on dental treatment in real patients.

While many providers have rapidly increased the availability of clinical simulation to maintain technical skills and partially compensate for lost placement opportunities, all have recognised that clinical simulation, either virtual or real, cannot, at the current time, replace clinical placements where real patients are treated. The technology of simulation, although developing rapidly, is unlikely at any time soon to replace the need for real time, real life, real patient, complex interactions and clinical skills experience. It does, however, have the potential to develop into an essential adjunct that adds value to the established approach of the student as the operator delivering patient care.

Apprenticeship programmes, particularly for dental nurses, may benefit from a blended learning approach, especially for the knowledge-based element of training. This would allow the courses that are often day-release to be undertaken remotely, avoiding the need to travel to attend teaching in person. For DCPs working in rural areas, travel is currently a barrier to accessing the course and the Oral Health Practitioner Apprenticeship is currently only available in the Thames Valley region. By offering a blended learning approach, access to the apprenticeship could be increased. This may also be true of other apprenticeships that rely on clinical workplace for clinical training such as orthodontic therapy.

As yet, virtual and mixed-reality have not been fully utilised in dentistry, apart from haptics in some schools. It could be utilised for all dental learners for human disease, medical emergencies, and human factors training, for both current learners and for GDC registrants attending continuing professional development and mandatory training. As clinical simulation opportunities add value to clinical training, there will be a need to demonstrate to all key stakeholders that these approaches have important roles in workforce development that strengthen the approach to patient safety.

4.3 Healthcare science

Background

Healthcare science describes over 50,000 professionals working in a wide variety of clinical specialties such as cardiac science, haematology, radiotherapy physics and clinical engineering. For a complete list of healthcare science specialties and professional bodies or associations, please see the end of this section.

The NHS Long Term Plan (LTP)[7] and People Plan[8] identify the need to significantly increase the healthcare scientists (HCS) workforce to deliver quality healthcare services. To deliver this increase there needs to an increase in the availability of essential clinical placements.

Changing practice means there will be a shift to care closer to home. This shift will require a review of the delivery of clinical placement education away from the acute NHS Trusts to more community, domiciliary and primary care settings. Already we are seeing that in audiology some clinical placements are being provided in high street healthcare services. While this shift has started, more needs to be done to ensure sufficient capacity across a full range of settings. COVID-19 has necessitated a change in the models of delivery of care to manage workflow and keep people safe. This has led to innovative practice in terms of using virtual platforms to deliver care in line with the NHSEI's definition of Technology Enabled Care Service (TECS).

Education practice is also changing with advances in technology and simulation providing opportunities for use in the delivery of HCS degrees. Good simulation done well is recognised as having value in preparing

students effectively so that when they enter the clinical learning environment, they are better prepared and can consolidate their skills rather than start from scratch.

As a result of the pandemic most HEIs delivering HCS programmes are implementing a blended approach; having moved theory teaching and assessment largely online, use of skills laboratories and simulation is supported and practical teaching in class, if provided, requires appropriate infection control and social distancing. Similarly, clinical placement provision requires appropriate infection control and social distancing and, in some cases, is provided by simulation as patient numbers are limited.

There is an increase in the number of healthcare science programmes being delivered as degree apprenticeships and blended learning is being used by HEIs to provide teaching and learning in the delivery of the degree apprenticeships. As the apprentice is employed and the employer required to support a minimum of 20% off the job learning, the use of blended learning and digital technology is an ideal method of providing the knowledge and skills.

Regulator perspective

There is one statutory regulator and three voluntary regulators for HCS professionals. Clinical scientist and biomedical scientist healthcare science professionals are regulated by the Health and Care Professions Council (HCPC). Clinical scientists are senior scientists who work either in the life science, physiological sciences, physical science or bioinformatics. Biomedical scientists work in the life sciences in pathology.

The Academy for Healthcare Science (AHCS), Registration Council for Clinical Physiologists (RCCP) and Register of Clinical Technologists (RCT) provide accredited voluntary registers. The voluntary regulators maintain registers for healthcare science workers who are not regulated by statute by the HCPC. The accredited voluntary registers are accredited by the Professional Standards Authority (PSA) established by government in preference to statutory registers. The PSA provides a statement recommending the use of practitioners who are registered on accredited registers emphasising the importance that people working in health and care are trained, skilled and treat patients and service users well.

All regulators and the National School of Healthcare Science (NSHCS) have given subsidiary advice about managing the learner experience during the pandemic to support progression and completion.

Health and Care Professions Council Clinical Science

The HCPC Standards of Education and Training (SETs) has a framework based on outputs. Each standard is framed in a way to describe what must be achieved. The HCPC guidance is not designed to be prescriptive. The HCPC has approved the National School of Healthcare Science (NSHCS) as an education provider for the National Scientist Training Programme (STP) for clinical scientists delegating the responsibility of accrediting HEIs offering STP programmes to the NSHCS.

The HEI providers then deliver these standards using a curriculum provided by the NSHCS and developed in collaboration with HCS professionals. Each HEI delivers the curriculum in the context of the environment they are operating in, the professions they are delivering to and the relationship they have with their stakeholders. They would be expected to explain and detail this at an approval event and would be reviewed against it annually through monitoring.

The HCPC encourages HEIs to consider the range of practice-based learning (PBL) opportunities they make available to support

the delivery of their curriculum through its Standards of Education and Training which says, 'the structure, duration and range of practice-based learning must support the achievement of the learning outcomes and the standards of proficiency.' (SET 5.2)[9]

For STP the NSHCS as the HCPC education provider has overall responsibility for the delivery and quality assurance of the work placement. This is achieved by working in partnership with placement providers to deliver a safe and supportive learning environment which is appropriate to deliver the learning outcomes.

The placement experience is integral to the delivery of overall learning experience and must relate to the profession it is intending to educate. For the STP the learner is employed in a supernumerary capacity for the duration of their training. The requirements for progression and the range of assessment methods in the clinical placement are determined by the NSHCS in line with any professional body standards or guidance.

The HCPC supports introducing innovation in practice-based learning using simulation, TECS and multidisciplinary approaches to practice-based learning. It is important that where innovation in PBL is introduced, education providers must be able to assure the quality of this type of placement in the same way as any other placement setting. This would include being satisfied about the arrangements for supervision, and that the environment is safe and supportive for learners. Practice educators must have relevant knowledge, skills and experience to support safe and effective learning and, unless other arrangements are appropriate, must be on the relevant part of the Register. (SET 5.6)[9]

The HCPC framework is designed to allow for flexibility around delivery with a consistent output. It is expected that education providers reflect current curriculum guidance from the professional bodies and subject benchmark statements. If a provider deviates from the curriculum guidance, they will be expected to provide detailed evidence to support any innovation.

Biomedical Science

Undergraduate Biomedical Science and HCS Practitioner Training Programmes (PTP) life science degrees approved by the HCPC are subject to the same HCPC SETS and provide eligibility to register as a biomedical scientist with the HCPC. Biomedical science degrees may also be approved by the Institute of Biomedical Science (IBMS). The IBMS provide a Registration Portfolio (Certificate of Competence for HCPC registration) that is a professional qualification demonstrating a learner has achieved the HCPC Standards of Proficiency for registration as a biomedical scientist.

PTP Life Science degrees are accredited by the NSHCS using the AHCS Standards of Education and Training.

Accredited Voluntary Regulators

Guidance from the voluntary regulators is in line with the HCPC, or equivalent, Standards of Education and Training, to ensure public protection at the same time as enabling healthcare education to introduce innovation.

This is achieved by applying standards which ensure learners are trained in a way that promotes safe and effective practice, enabling education providers, professional bodies and clinical placement providers to best determine how this is achieved within the appropriate SET

Academy for Healthcare Science (AHCS)

The AHCS delegates the accreditation of HEIs delivering HCS undergraduate Practitioner Training Programmes (PTP) to the NSHCS. The NSHCS conduct the accreditation process against the Academy Standards of Education and Training and Standards of Proficiency (SoP) for HCS Practitioners; both equivalent to the HCPC SETS and SoP.

The PTP curriculum details the learning outcomes HEIs must deliver and includes skills assessments mapped to professional body guidance. Recently it has been difficult to meet many of these skills assessments in the workplace due to restrictions imposed because of the pandemic. The NSHCS and AHCS have provided HEIs with the flexibility to progress and complete learners by assessment of the high level outcomes to be achieved through the curriculum. This approach recognises the importance of both simulation and engaging with new technologies and blended learning in delivering the placement experience.

HCS PTP learners are normally required to complete 50 weeks clinical placement across the 3-year course. However, due to the pandemic and following recommendations from the PTP Improvement Survey this requirement is under

review. Flexibility is allowed in reducing the total clinical placement with emphasis on the learners demonstrating the programme learning outcomes. It is expected that the current total 50 weeks will be reduced to 30 weeks or equivalent hours. Any reduction in clinical placement time or introduction of new innovative methods will require providers to assure the quality of the placement.

As learners progress into employment, they may need to continue to be supported in a preceptorship year to continue developing their professional skills and competencies.

Registration Council for Clinical Physiologists (RCCP)

Accreditation for Higher Education Institutes (HEI)

The RCCP sets standards for registrants including those for pre-registration programmes. It has a responsibility to ensure that graduates are safe and competent practitioners who are eligible to apply for registration. The RCCP is not directly responsible for the curriculum or competencies of pre-registration programmes which are developed by the professional bodies working with education providers and NSHCS. However, the RCCP is responsible for ensuring that education providers deliver the content and curriculum to the standard required for competent, safe practice.

The RCCP ensures that appropriate standards are developed and maintained to assess registrants to the register. RCCP guidelines are intended for use by those delivering and accrediting courses that lead to registration in the following disciplines: audiology (including hearing therapy and educational audiology), cardiology, GI physiology, neurophysiology, respiratory physiology and sleep physiology.

Register of Clinical Technologists

Entrants to the accredited RCT must demonstrate that they meet the education and training standards by successfully completing a PTP degree in the relevant specialism (clinical engineering or medical physics (IPEM) works with the NSHCS to ensure the highest standards of education and training in medical physics and clinical engineering. It is the responsibility of the NSHCS to accredit undergraduate degree programmes that are delivered as part of the national PTP.

Professional body perspective

Professional bodies provide guidance to the NSHCS and HEIs on curriculum content and placement education. They have also provided subsidiary advice about managing the student experience during the pandemic to support progression and completion. The role of professional bodies and employers will be important in supporting newly qualified graduates entering employment that may have had their training affected by the current pandemic.

Healthcare science professional bodies

For a complete list of healthcare science professional bodies visit the Academy for Healthcare Science website.

Blended learning

Overall, there are various requirements and standards by individual regulators, professional bodies and councils in the delivery of healthcare science education. There are current opportunities to utilise blended learning approaches or increase its use, this needs to be considered in the context of the learning attained recently and the emerging evidence in this space.

4.4 Medicine

Regulator – General Medical Council

The General Medical Council (GMC) is an independent regulator and is responsible for setting standards that medical training organisations are expected to meet in the delivery of their training. Furthermore, it sets the outcomes that medical students and doctors in training should achieve by the end of their training.

Medical schools must provide an education that allows newly qualified doctors to meet all the outcomes, including the core set of practical skills and procedures, and therefore to be fit to practise safely as a doctor when they graduate. The legislative framework for undergraduate medicine is centred around the GMC approving institutions that can deliver Primary Medical Qualifications (PMQs) and engaging with the institutions to ensure they meet the GMC standards (Promoting Excellence) and can ensure their graduates meet the GMC Outcome for Graduates.

Promoting excellence

This document sets out the requirements for medical education and training that organisations in the UK must meet.

The 10 standards set out requirements for the management and delivery of undergraduate and postgraduate medical education and training.

General Medical Council – Standards, guidance and curricula

Outcomes for graduates

Outcomes for graduates sets out the knowledge, skills and behaviours that new UK medical graduates must be able to show.

General Medical Council- Outcomes for graduates

The GMC works with bodies entitled to award PMQs to quality assure innovative programmes, for example, Edinburgh's programme targeted at healthcare professionals.

Overall, the use of innovation and technologies will be driven by providers who are a body on GMCs list that can issue PMQs.

Professional body - Medical Schools Council

The Medical Schools Council is the representative body for UK medical schools. The Council acts as a forum for medical schools to provide expert opinion on areas of medical education and research. It is made up of the heads of UK medical schools and meets in order to shape the future of medical education in the UK.

While they all work towards meeting a common standard, which is set by the GMC, no two medical degrees are the same. This variation can be in areas such as course structure, the types of placements offered, and teaching styles used. In these ways each medical school is able to build its own set of values into its training and contribute graduates to a medical workforce which can provide the many services required by the National Health Service.

The use of blended learning

The Medical Schools Council is very supportive of using innovative and excellent ways of facilitating learning that matches outcomes similar to face-to-face delivery. This has been reinforced by the recent pandemic; much more could be online, and highlights elements of medical education that innovation and technologies can be utilised for effective learning.

Digital learning resources

In addition to supporting the use of innovative technologies, the Medical Schools Council offers several online learning resources to UK medical schools as part of their membership. These are:

Virtual Primary Care
Speaking Clinically
Medical Schools Council eLearning Resources

4.5 Nursing and Midwifery

Background

Attracting and training nurses requires a multipronged approach including the ability to attract greater numbers of people from a diverse range into the nursing profession, with consideration for accessible, flexible learning approaches. This need has been illuminated by the recent pandemic which has resulted in a shift in the delivery of nursing and midwifery education.

Additionally, the value of current and emerging technology in the delivery of 21st century healthcare cannot be overemphasised and provides opportunities for use in the delivery of education and training of the nursing and midwifery workforce.

Increasing the supply and diversity of both the nursing and midwifery workforce is essential and requires a concerted collaborative effort between various system partners, commissioners, educators, practice organisations and regulators.

Regulator perspective

The role of the Nursing and Midwifery Council (NMC)

The Nursing and Midwifery Council (NMC) is the professional regulator of almost 745,000 nursing and midwifery professionals. Its vision is safe, effective and kind nursing and midwifery care that improves everyone's health and wellbeing.

As part of their regulatory role the NMC sets the standards for education, training, conduct and performance so that nurses, midwives and nursing associates can deliver high quality and safe care throughout their careers.

The standards framework for nursing and midwifery education part 1 (2018) applies to all Approved Education Institutions (AEIs) and their practice learning partners that have been approved to deliver NMC programmes.

These standards aim to provide AEIs and practice learning partners with the flexibility to develop innovative approaches in their education and training programmes for nurses, midwives and nursing associates, while being accountable for the local delivery and management of approved programmes in line with the standards. Pre-registration nursing and midwifery programmes may offer various academic and flexible routes to registration when seeking approval in line with the standards. Such routes include a blended learning approach.

The standards framework for nursing and midwifery education part 1 should be read alongside part 2: standards for student supervision and assessment and part 3: programme standards. The programme standards being specific for each profession or programme, along with the relevant standards of proficiency. Together these are the NMC Standards for education and training ('Realising Professionalism') for the nursing and midwifery professions. Education institutions must be approved against these standards to run any NMC approved programmes.

AEIs are responsible for working with practice learning partners to develop the curriculum and manage the quality of their educational programmes. Overall responsibility for the day-to-day management of the quality of any educational programme lies with an AEI, in partnership with practice learning partners who provide opportunities for practice learning experiences for both nursing and midwifery students.

Before a programme can be delivered, an approval process takes place to ensure that the proposed programme meets the NMC standards.

Public safety is central to the standards as students are in contact with people throughout their education and it is important that they learn in a safe and effective way.

Through the Quality Assurance (QA) processes, education programmes are monitored to ensure that they continually meet the standards, and that education institutions and practice learning partners are managing risks effectively. Using internal and external intelligence, risks are monitored to ensure ongoing quality in education and training; this intelligence gathering includes analysis of system regulator reports. Processes are in place for collecting, analysing and responding to any risk intelligence received regarding educational programmes, including concerns raised directly by students. Approved education providers are required to self-report annually any risks or concerns that could affect the quality of programme delivery and, therefore, any risks to the public.

In order for AEIs to deliver a blended learning route they must either seek approval of a new programme or modification of a programme already in approval. This must be done in line with the NMC Quality Assurance framework.

Aspects to consider when developing a blended learning programme

The NMC will consider approval or major modification of nursing and midwifery programmes to be delivered using blended learning approaches, and in line with the quality assurance framework will see how AEIs are:

- evidencing how their courses meet the NMC education programme standards and the standards or proficiency for registered nurses (2018) and education programme standards and standards of proficiency for registered midwifery (2019)

- provide a clear strategy for technology enhanced and simulated learning that demonstrates how technology will be used

effectively and proportionately in theoretical and practice learning

- considering the impact on the student experience and how they provide student support, supervision and assessment in line with the standards

- indicate how following standards are being met and utilised to develop programmes

- Standards framework for Nursing and Midwifery Education

- Standards for student supervision and assessment

- Standards of proficiency for registered nurses

- Standards for pre-registration nursing programmes

- Standards of proficiency for midwives

- Standards for pre-registration midwifery programmes

Practice learning and the EU directive

EU legislation set out the minimum education and training requirements for nurses and midwives for many years. The NMC has been required to adhere to this legislation, as outlined in the programme standards, with limited or no reference to technology and simulated learning. This means, for example, that nursing students are required to undertake 2,300 hours of practice learning that involves people, healthy or ill, in communities of health, which can restrict innovative simulated practice learning activity. Now the EU exit transition period has ended, the UK is no longer required to follow EU minimum standards for nursing and midwifery education programmes. However, as they form part of the programme standards, the NMC commissioned independent research to help understand whether there should be a move away from any of the EU requirements and therefore change the programme standards. Further information can be found here on this research. A programme of work to review some of these standards is now underway and includes the use of technology and simulated learning.

The COVID-19 education recovery standard to support nursing students allowed students to undertake up to 300 hours and in some cases up to 600 hours of simulated learning across the length of their programme. The learning from this change will contribute to any potential changes in the future to the programme standards around the use of technology and simulated learning in practice education.

The Council of Deans of Health

The Council of Deans of Health welcomes the opportunity to contribute to this report. The Council represents 100 UK university faculties engaged in education and research for nursing, midwifery and the allied health professions.

This position has been developed following consultation with our members, including those who have been commissioned to deliver blended learning nursing programmes and other universities across the UK. The Council will continue our work to support members who are currently delivering blended learning programmes and those who plan to do so in the future.

Changes in education delivery

Healthcare faculties across the country are constantly reviewing and modernising the way healthcare higher education is delivered across both theory and practice. This includes blending different and flexible teaching methods and pedagogies, expanding online and distance learning, investing significantly in simulation and

digital technology platforms, and facilitating more interdisciplinary learning.

Healthcare higher education has faced significant challenges in the context of the COVID-19 pandemic. UK universities introduced extensive use of remote online and digital learning for academic and theory education to reduce human interaction and conform with government guidelines on social distancing. Online patient consultations were used for vulnerable healthcare students to access practice settings without endangering their health. Immersive technology platforms were deployed to enable simulated practice placements. These allow students to develop skills and behaviours without the need for in-person face-to-face interaction.

We need to learn lessons from the digital innovation deployed by UK universities in the context of the pandemic and see which technologies enable students to best meet regulatory standards of proficiency. The increased use of blended learning has presented opportunities for higher education to take greater advantage of digital and technological innovation in the future.

Key messages

1. Blended learning provides an opportunity to access healthcare higher education for prospective students who may not have done so in the past or through existing routes.

2. Blended learning programmes should not only give students the competencies to gain professional registration but also equip them to work within the fast-changing landscape of technology-enabled healthcare services.

3. More work should be undertaken by HEE with universities and employers prior to procurement to understand the needs of employers, the demographic groups that most benefit from these programmes and local widening access and participation ambitions.

4. Blended learning programmes provide opportunities to rethink the regulation of practice placements. There is a need for greater regulatory flexibility to allow for the increased use of simulation and immersive technologies, especially in nursing and midwifery education.

5. In the future more placements will need to be developed across the private, voluntary and independent sectors as well as in research, education and the third sector. Increased used of simulation and digital technologies should also enable the development of new virtual placement opportunities, which will ease pressure.

Regulators, in partnership with educators, service and other stakeholders, should undertake work to understand which new technologies can be used across theory and practice education to ensure competency against certain professional standards.

4.6 Pharmacy

Regulator perspective

The General Pharmaceutical Council – Regulation of education and training.

The General Pharmaceutical Council (GPhC) regulates pharmacists, pharmacy technicians and pharmacy premises in Great Britain.
The GPhC sets the standards for the initial education and training of pharmacists and pharmacy technicians, the education and training of pharmacist independent prescribers and requirements for support staff.

The standards for the initial education and training of pharmacists have recently been revised (January 2021). To qualify as a pharmacist will continue to

take a minimum of 5 years and includes the following steps:

- Successful completion of a GPhC accredited Master of Pharmacy degree (MPharm), which is a full-time, 4-year course.

- Successful completion of the foundation training year (52 weeks), a period of paid employment in a community or hospital pharmacy during which a trainee is required to build up a portfolio of evidence and demonstrate their competence whilst being observed at work.

- Successful completion of the GPhC's registration assessment.

- Meeting the fitness to practise requirements for registration as a pharmacist.

- During their initial education and training students/trainees will need to demonstrate that they meet the learning outcomes, which are outcome based.

- After the 2021 standards are fully implemented, the foundation training year will also entail a period of learning in practice directly related to independent prescribing, during which trainees must complete at least 90 hours of supervised practice under the supervision of a designated prescribing practitioner.

- To qualify as a pharmacy technician takes a minimum of 2 years and includes the following steps:

○ Successful completion of a GPhC-approved integrated competency and knowledge-based qualification/course – The course is flexible in its delivery. It can be delivered face-to-face, at a distance, online or a combination of these.

○ Successful completion of a minimum of 2 years' consecutive work-based experience in the UK under the direction of a pharmacist or pharmacy technician to whom the trainee is directly accountable for not less than 14 hours per week.

In order to qualify as an independent prescriber, pharmacists must complete a GPhC-accredited course, which is typically run over a period of 6 months. The course is part-time and often delivered through a combination of face-to-face teaching sessions (often 1 day per week) and self-directed study.

Some universities offer a course with a larger distance learning option; however, all courses will involve a minimum of 26 days of teaching and learning activity. In addition to this, each pharmacist must successfully complete at least 90 hours of learning in a practice environment whilst being mentored by a medical practitioner.

The GPhC does not set specific requirements regarding blended learning.
Most course providers have delivered a large part of their programmes (mainly theory teaching) online during the COVID-19 pandemic but retained practical teaching in class/placements.

Providers have been asked to report on these changes. The Council is very supportive of the blended learning approach and the new standards for pre-registration training provides opportunities for higher education institutes to utilise various approaches including blended learning to achieve established education outcomes.

The standards do not have restrictions on the use of digital and other technologies in the delivery of pharmacy education which promotes innovation and flexibility to use blended learning approaches but not distance or online courses.

4.7 Psychological professions

Background

The NHS Long Term Plan advocates for digital solutions to improve the delivery of mental healthcare and address unmet needs.[7] An increase in the use of technology across healthcare also necessitates a psychological workforce that is digitally capable. In addition, the COVID-19 pandemic has led to a shift in the approach to technology, particularly in the training and education of the workforce. The professional and accrediting bodies of the psychological professions provide mixed guidance related to the use of digital methods and technology in training, which has been summarised in this paper to offer an overview.

The psychological professions are a diverse group of professions whose work is informed by the disciplines of psychology and psychological therapy. For the purposes of this paper, the 12 psychological professions are adult psychotherapists, child and adolescent psychotherapists, children's wellbeing practitioners, clinical psychologists, cognitive behavioural therapists, counselling psychologists, counsellors, education mental health practitioners, family and systemic psychotherapists, forensic psychologists, health psychologists and psychological wellbeing practitioners.

The standards of education and training for the psychological professions are set out by several, distinct professional bodies, which are detailed below. Children's Wellbeing Practitioners and Educational Mental Health Practitioners do not currently have course accreditation by a professional body. The BABCP and BPS are in the process of launching a registration process for PWPs and hope to offer registration for CWPs and EMHPs in the future. Additionally, professions such as counsellors and psychotherapists have training standards accredited by several different bodies, some of which are not included in this paper. Therefore, some of the guidance detailed below may not apply consistently across a single profession or between professions.

Training for 6 of the 12 psychological professions – child and adolescent psychotherapists, children's wellbeing practitioners, clinical psychologists, cognitive behavioural therapists, education mental health practitioners and psychological wellbeing practitioners – is funded by HEE. However, there are members of all 12 professions working in NHS commissioned healthcare.

Regulator's perspective

The Health and Care Professions Council (HCPC)

The Health and Care Professions Council (HCPC) regulates the 4 practitioner psychologist types represented in NHS commissioned healthcare: clinical psychologists, counselling psychologists, forensic psychologists and health psychologists. Their Standards of Education and Training (SETs) has a framework based on outputs.

Each standard is framed in a way to describe what must be achieved. The higher education institutes (HEIs), as providers, then have the autonomy to deliver these standards through their own curriculum design. The guidance is not designed to be prescriptive. Each HEI would then take the guidance and develop their curriculum in the context of the environment they are operating in, the professions they are delivering to and the relationship they have with their stakeholders. They would be expected to explain and detail of this at an approval event and would be reviewed against it annually through monitoring. For the practitioner psychologists this approval and monitoring process is conducted jointly by HCPC with the British Psychological Society.

Education providers are already encouraged to consider the range of opportunities they make available to support the delivery of their curriculum through the HCPC standards of education and training which say, 'the structure, duration and range of practice-based learning must support the achievement of the learning outcomes and the standards of proficiency.' (SET 5.2)[9]

Simulation is currently used within professional training programmes to prepare learners to enter practice-based settings and to support the observation and assessment of practical skills in a controlled environment. In recent months, the focus has been on exploring opportunities for simulation and other learning technologies to be used more widely as a suitable learning experience. The intent is to explore to what extent it could function interchangeably alongside the more traditional practice-based learning experience, rather than being only viewed as an add-on to it.

The HCPC supports the collective effort being undertaken by workforce and employer led organisations alongside the professional bodies to develop a new consensus in this area of simulation and learning technologies. Their expectations within the context of the standards of education and training remain the same; education providers must ensure the practice experience in simulation is suitable to support the achievement of programme learning outcomes. These standards outline that learning and teaching methods used must be appropriate to the effective delivery of learning outcomes.

The practice learning experience is expected to be integral to the delivery of overall learning experience and must relate to the profession it is intending to educate. How this is done is up to the provider. The exact number of hours, the requirements at each progression point, the model of delivery, where and the range are all determined by the education provider in line with any additional professional body standards or guidance.

Embedding suitable technology enabled care service opportunities can certainly form part of the overall profile education providers are looking to offer going forward and the HCPC welcomes education providers seeking to innovate in this area. Importantly, education providers must be able to assure the quality of this type of practice learning in the same way as any other practice learning setting. This would include being satisfied about the arrangements for supervision, and that the environment is safe and supportive for learners.

The framework is designed to allow for flexibility around delivery whilst ensuring a consistent output. It is expected that education providers reflect current standards for pre-registration education and/or curriculum guidance from the professional bodies and subject benchmark statements. If a provider deviates from the standard/guidance, then they would be expected to provide detailed evidence to support any innovation.

Currently, when significant changes to programmes are being considered providers should notify the HCPC either before or after they are implemented, including any changes to practice learning based on the themes set out in this paper. Once notified the HCPC can take 3 actions:

1. consider the changes as part of the annual monitoring process
2. partner visitors to assess whether the programme continues to meet the standards via the submitted paperwork
3. assess the programme via an approval visit

This is an iterative process and providers are always advised to contact the HCPC when making changes for them to support and guide the process. The current change and quality assurance processes are under review and will be updated soon.

Professional bodies/associations The Association for Family Therapy and Systemic Practice (AFT)

The Association for Family Therapy and Systemic Practice (AFT) is a registered charity working to benefit the public by promoting effective family therapy and systemic services and high standards of professional training and practice. It does this:

- accrediting professional family and systemic training courses run by external training providers
- supporting qualified family and systemic psychotherapists with application to the UKCP register and maintaining the requirements
- supporting all members with systemic skills and knowledge development with resources and guidance
- developing workforce training in systemic practice for key services

The 4th edition of the AFT standards reflects a wish to ensure that training standards continue to fit with the competencies required to carry out systemic practice with changes in society, employment contexts, research and client needs.

The 4-year training is designed to qualify students to work with families, couples, individuals, other systems and relationship networks and includes training relevant to work with children and adolescents.

Design and delivery of courses

Courses are encouraged to develop their teaching and course delivery in innovative ways and course accreditation is an effective way of sharing good practice. However, courses will be required to meet the established standards. Teaching methods must be appropriate for the course content as well as reflecting systemic theory and philosophy and accepted principles of adult learning.

A range of teaching methods appropriate to adult education and the teaching of systemic ideas and practice are encouraged for the delivery of education. In the context of the pandemic, AFT have agreed that 100% of training, practice and supervision for all courses can be online for the period up to December 2021. Beyond this time period, it is proposed that a minimum of 50% of clinical work should be face-to-face in the room. Additionally, outside of the pandemic context it is recommended that distance teaching and learning technologies should not be used prior to face-to-face contact and a learning relationship has been established.

Association of Child Psychotherapists (ACP)

The Association of Child Psychotherapists (ACP) is the main professional body for child and adolescent psychotherapists in the UK and accredits all training courses for child and adolescent psychotherapists.

ACP's primary role as a professional body under the Professional Standards Authority (PSA) is to ensure professional standards continue to be met and to take appropriate action if they are not. Their role is also to ensure that everyone who requires the highly skilled care provided by child and adolescent psychotherapists can access this when and where needed.

Design and delivery of courses

ACP's Quality Assurance Framework for Training in Child and Adolescent Psychoanalytic Psychotherapy has no requirements that would preclude blended learning. However, the complexity of the clients the child and adolescent psychotherapists tend to work with may require

additional consideration around the suitability of remote methods for client contacts.

During the pandemic, teaching was transferred online and has used a live learning method. Trainees have been on placement and it has varied widely depending on provider and context as to whether trainees have been working in person or remotely. The has been a wide embrace for online working, with a statement of variance issued to reinforce the importance of not reducing standards but recognising that some competences can be achieved using other means. Going forward, there will be an introduction of digital competences in recognition of the likelihood of mixed provision in the future. Alongside all of this, supervision groups were set up to support each other in managing virtual delivery.

British Association for Behavioural and Cognitive Psychotherapies (BABCP)

The BABCP is the lead organisation for Cognitive Behavioural Therapy (CBT) in the UK and Ireland. It promotes, improves and upholds standards of CBT practice, supervision and training.
The BABCP supports its members to develop professionally and link with the CBT community. It is a professional association operating a highly respected voluntary register for, amongst others, accredited cognitive behavioural therapists, and helps to protect the public by supporting best practice.

CBT practitioners who can demonstrate they meet BABCP's standards of education, training, supervision, work experience and other areas of personal development can apply to become accredited. Higher education courses which can demonstrate they meet BABCP's standards of education and training can also apply for accreditation.

Design of delivery and courses

The Minimum Training Standards stipulated by the BABCP do provide some flexibility in relation to demonstrating knowledge and competences. However, there are currently strict requirements around the minimum length of study and modalities. In relation to blended learning, the current Minimum Training Standards require 200 hours of face-to-face teaching, with up to 20% being delivered by distance learning with a real-time/live interactive element. The Minimum Training Standards also require 200 hours of face-to-face clinical contact.

During the pandemic, the BABCP will recognise all remote teaching, with the provision that this must be conducted in real time, and remote clinical contact. The BABCP also stated that the requirements of face-to-face teaching were being reviewed prior to the pandemic and are still under review, indicating that the 20% restriction may change in the future. There is some evidence about increased skills acquisition in managing therapeutic relationship particularly using phones. The BABCP have found recently that remote learning has attracted diverse students and made course more accessible especially to students with disabilities and those living at a distance from their educational institute. Also, CBT outcome data for England showed improvements in outcomes which coincided with the move to entirely remote provision.

As a result of this learning from the pandemic, the BABCP has extensively reviewed its Minimum Training Standards and Core Curriculum and the final draft is now ready to go out to consultation. The updated version will include a change to the expectation that all teaching will be in person and the upper limit on how much teaching can be delivered remotely will be removed. The requirements are being updated to ensure all theoretical and skills teaching must include a 'live' element, such as opportunity for discussion, small group and questions. There is not currently a specification of how much teaching must be

synchronous and this will be reviewed on the basis of emerging evidence.

British Association for Counselling and Psychotherapy (BACP)

The BACP is a professional association for members of the counselling professions in the UK, championing the counselling professions as a viable, and increasingly evidence-based choice for people seeking therapy. BACP support members throughout their careers to make a positive difference to the mental wellbeing of their clients.

BACP members can evidence their experience and adherence to professional standards via the well-recognised BACP individual accreditation scheme which offers a valued quality mark. This requires members to evidence 450 hours of core training and 450 hours of client work, and evidence of their experience, competence, and supervision. Alongside this, BACP also runs accreditation schemes for counselling services and for training courses and has a qualification approval scheme for awarding organisations.

Prior to the pandemic, BACP had a series of membership, registration, and accreditation standards. The requirements included 100 face-to-face hours with clients in a placement while in core training and all training hours needed to be face-to-face rather than online.

During the pandemic, BACP flexed the usual requirements. Standards for entry into membership and registration changed to allow for online training and online client work in order not to disadvantage trainees. Members could accumulate these hours remotely, providing that the tutor contact hours were synchronous and via a video platform, and that placement hours were still conducted with real clients and in agreement with the placement provider. Specific guidance was provided for training providers to support these changes.

During the course of the pandemic, it became apparent that many trainees were coming to the end of their training and placements without any experience of working face-to-face with clients. BACP therefore encouraged training courses to formulate a form of assessment for these trainees, and BACP guidance gave some suggestions of how to do this, for example via a peer counselling assessment or a reflective assignment.

BACP also provided general guidance on best practice and areas of consideration for training providers, including:

- trainers ensuring that trainees have enough teaching hours either online or face-to-face to meet the requirements of the course and its learning outcomes
- the use of virtual classrooms for tutor contact hours but ensuring that trainers are skilled and competent for such delivery and trainees have the right conditions in place to fully engage with their learning
- online or phone working will only be acceptable as an interim arrangement during the pandemic and if a considered plan for ensuring safe, ethical practice is in place, and provided that trainees have been taught and assessed in basic competences for this way of working

BACP accredited and approved core trainings

BACP runs a course accreditation scheme and approved qualification scheme which both provides a direct relationship with accredited courses and qualification partners and enables BACP to assess quality standards of core trainings.

BACP collaborated with accredited courses and approved qualification partners to agree the flexibilities regarding tutor contact hours and

placements, and to provide a space for discussion, guidance, and support. Network meetings have also taken place between course providers as a form of collegiate support and to establish best practice in online teaching delivery and remote placements.

Accredited and approved trainings were required to embed the flexibilities to usual requirements, including the need for an assessment of face-to-face practice for students who had accumulated placement hours solely online and/or by phone.

Accredited courses were still required to meet the requirement of at least 400 tutor contact hours, but these could be delivered remotely with the same flexibility for other core trainings.

Future requirements

In 2020, BACP carried out a review of the e-Counselling and Telephone Competence Framework, now renamed as the Online and Phone Therapy (OPT) Competence Framework. This is being used to underpin a training curriculum due to be published in Spring 2021 and an addendum to the course accreditation criteria.

Regarding BACP's longer-term position, from September 2021, accredited core training courses and approved qualification providers will be able to provide up to 30% of training remotely, providing it is synchronous and via video-based platform (this percentage will be under review). Furthermore, up to 50% of placement hours can be delivered remotely via a combination of online-video and phone, or online-video only. Other changes in the addendum to course accreditation are underpinned by the competences in the OPT framework and will be confirmed in the Summer.

This change to BACP's requirements also extends to all core training courses (for example, those not BACP accredited) and this will be reflected in a change to the requirements for individual membership which currently exclude online learning. A guidance document for all training providers who wish to include some online teaching delivery was produced and published on the BACP website in Spring 2021.

British Psychoanalytic Council (BPC)

The BPC is the leading UK professional association and a Professional Standards Authority Voluntary Accredited Register for the psychoanalytic and psychodynamic psychotherapy profession.

As well as a regulatory role, BPC advances the knowledge and understanding of the theory and practice of psychoanalysis and psychoanalytically informed therapies in a range of critical policymaking and opinion-forming arenas in the UK.

During the pandemic, Member Institutions (MIs) successfully adapted their courses to online/ remote learning. Courses are generally divided into 3 parts; training, placement and personal therapy and BPC issued guidance to provide information to Members Institutions on how to manage and maintain all three areas online or over the phone during the pandemic. BPC is discussing what methods of training may remain digital going forward.

Overall blended learning programmes may be possible, however, for psychoanalytically based work it would only be a limited part of the overall training.

British Psychological Society (BPS)

The British Psychological Society (BPS) is the learned and professional body, incorporated by Royal Charter, for psychology in the United Kingdom. The key objective of the BPS is to promote the advancement and diffusion of the knowledge of psychology (pure and applied) and promote the efficiency and usefulness of

members, by setting up a high standard of professional education and knowledge. In the context of the psychological professions, the BPS accredits and details the standards of training for clinical psychologists, counselling psychologists, forensic psychologists and health psychologists, as well as providing the standards for psychological wellbeing practitioner training.

The BPS standards are intended to be interpreted and applied flexibly, in a way that enables programmes to develop distinctive identities that make the most of particular strengths shared by their staff team, or those that are reflected in the strategic priorities of their department or university.

The BPS was very flexible around the use of blended learning during the pandemic, however most programmes are looking forward to going back to face-to-face training. While there was overall flexibility, there were stipulation for meeting standards, with more flexibility allowed in the delivery of content rather than in the assessment of competency.

There are some courses that have key aspects with placement and case studies which remained, but consideration given to delivery in a remote way.

Services and providers have moved to alternative ways of providing services and education while being cognisant of in-patient experience and face-to-face being critical. Also using blended approaches is key to providing flexibility to allow accreditation of certain aspects and ensuring that standards and proficiency are maintained. While the BPS has no overall restrictions in the use of technology to deliver blended learning education, it will continually review current standards post COVID-19 to explore changes in the future to ensure that standards remain fluid.

The United Kingdom Council for Psychotherapy (UKCP)

The UKCP represents a range of different psychotherapies and sets standards in all areas of psychotherapy practice and training. It keeps a register of approved psychotherapists and those who have successfully completed an approved 4-year training programme are eligible to apply for registration.

In the age of ever-increasing use of technology, there is a clear need to ensure that an appropriate balance between live and online teaching can be reached for those training Organisational Members (OMs) who wish to utilise this medium, in order to maximise students' experience and learning.

Training organisations should have policies in place which govern the extent and the type of technologies that are to be used in the delivery of training, for example the internet. Normally, distance teaching and learning using these technologies should not exceed 50% of the total contact time. Distance teaching and learning technologies should not be used prior to face-to-face contact and a learning relationship has been established.

The UKCP recommends:

- programmes should be created based on solid principles, for example, 5 stage model of e-moderation.
- consideration should be given to the appropriate blend of live training along with a combination of synchronous and/or asynchronous discussion
- significant attention should be given to the issue of confidentiality given that self-disclosure is likely to increase, and this information is stored electronically

- tutor roles should be well defined and include specific roles of moderation and support for students who struggle for any reason (personal process, technology)

- course designers and tutors should have studied the design and delivery of online courses, formally or informally but to a sufficient degree to inform their practice

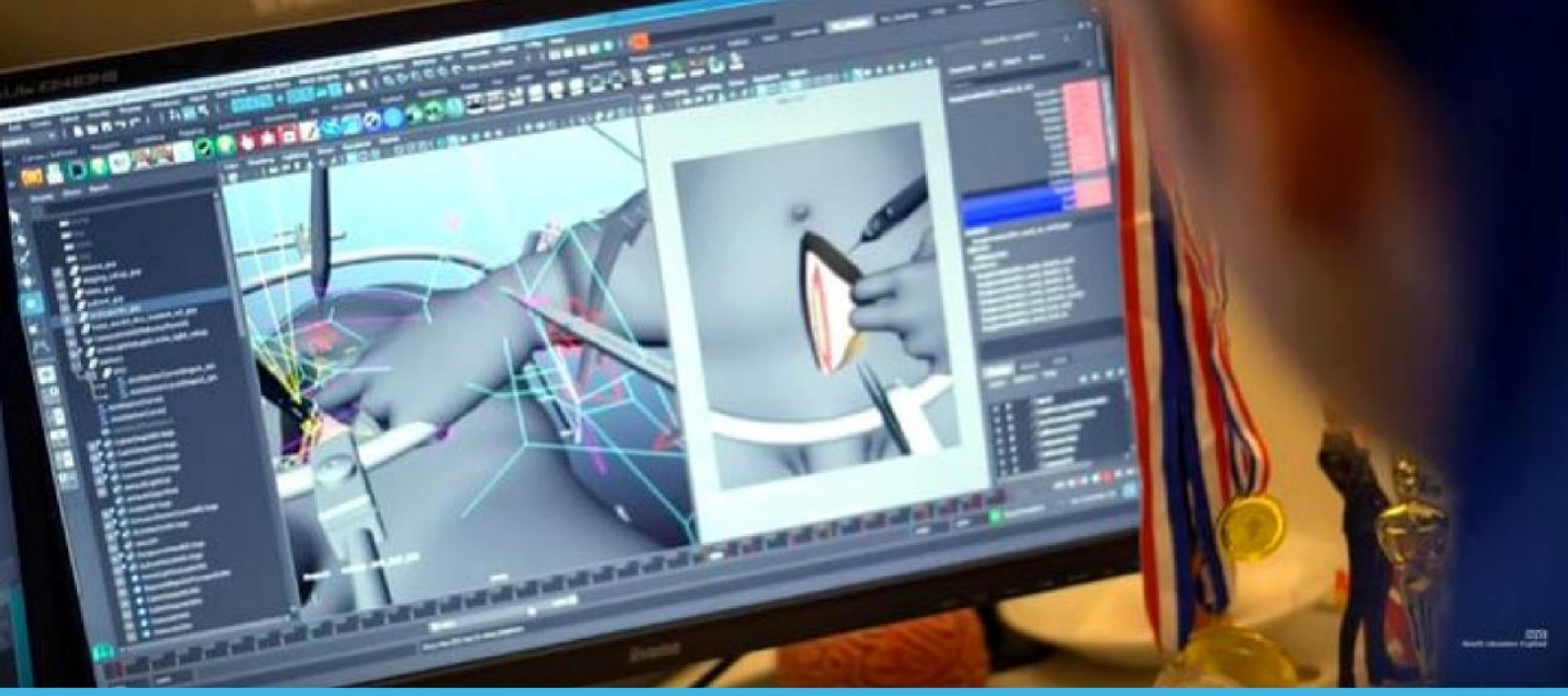
- supervision can take place in facilitated groups, peer groups, on a one-to-one basis, by telephone, online, in writing, verbally or by use of digital media. Appropriate modes of supervision will need to be determined by the circumstances; and using different methods (for example, live observation, digital recordings, written and verbal reports)

- where the supervision is of a trainee the vast majority (for example more than 60%) of the supervised practice hours normally should be completed face-to-face. Exceptions to this should be negotiated and evidenced in writing by the OM.

Conclusion

Overall, there is general support for exploring the continued use of blended learning approaches in the core training of the psychological professions. The professional bodies rapidly and effectively developed guidance to allow for remote provision during the COVID-19 pandemic and this will be reviewed and adapted for the new landscape of blended approaches.

Blended learning has the potential to improve access and quality, but further evidence may be required to substantiate these anecdotal findings. In addition, it is unlikely that any core training will opt for an entirely remote approach and instead blended learning is likely to be preferred.



5.0. Learning and support technologies

Introduction

The Blended Learning Programme provides a fully blended face-to-face, digital and online, theoretical and practical learning to those people who may have the aptitude and values to join healthcare professions, but currently are unable to access traditional programmes.

Healthcare students pursuing degrees through fully integrated blended learning programmes, will need to rely extensively on technology to access their education given the need to blend face-to-face teaching with more digitally enabled methods. The use of immersive technologies in simulation and the role of technology in the education of future healthcare students will be critical.

HEE is committed to ensuring that healthcare degrees take full advantage of current and emerging innovative technologies[10]. The Topol Review outlined the need for the future workforce to be ready to adapt to technological change in healthcare delivery, with education and training being at the core of this[3].

Many universities already offer fully online degrees for some programmes and many practice-based degrees like nursing already contain elements of technology in teaching. Integrated blended learning programmes offer the opportunity to take greater advantage of online pedagogies, simulation and technology-enhanced learning.

The COVID-19 pandemic has forced many higher education providers to rethink their provision and seek alternative ways to deliver teaching and improve access to technology for students on their programmes.

Technology can support the delivery of core healthcare curricula such as through virtual classrooms and online pedagogies, the use of simulation-based education including virtual and mixed realities, and collaborative online spaces for seminars and tutor groups. However, technology also offers opportunities to support clinical placements and increasing the available capacity using techniques such as virtual ward rounds and the provision of remote supervision and mentoring.

Robust systems should support teaching of the core curriculum and practice learning. These should capture learning activity and monitor performance. This could take the form of e-portfolios linked to learning management systems, or may take advantage of the emerging opportunities presented by machine learning to build 'digital twins' to actively support performance of students.

5.1 Purpose of section

The use of technology for blended healthcare degrees is likely to have a profound impact on the way that future healthcare education is delivered across the UK and around the world. The success of universities pioneering the use of blended techniques can be measured not only by the number of new students trained but also by the characteristics of the new workforce.

This section outlines proposed solutions for use of technology in blended healthcare professions education programmes based on good practice nationally and internationally. This includes technical considerations, minimum acceptable standards and how the benefits of investment can be measured. It also provides an overview of parameters that HEE would expect to have been considered by education providers when developing and delivering blended learning healthcare professional education.

5.2 Scope

These guidelines are primarily aimed at educators and commissioners.

When considering the implementation of any form of technology in education, it is important to remember that technology should not drive the education, but the education should make best use of the emerging and available technologies to ensure robust educational outcomes. The technologies chosen for implementation should also support the most appropriate and suitable pedagogical approach and meet student needs.

It is impossible to cover the breadth of technologies which may be incorporated into teaching now and in the future, so general principles are covered that apply to a wide range of learning methods such as eLearning, mobile learning, learning management platforms, immersive technologies and more. The section also discusses accessing the evidence base and how these can be incorporated into delivery.

5.3 General principles of technology selection

Technology used to educate future healthcare students through blended learning should:

- be patient and student centred and service driven
- be educationally coherent
- be innovative and evidence based
- deliver high quality educational outcomes
- deliver value for money
- ensure equity of access and quality of provision

The following principles should also be considered when designing or commissioning the learning. These principles draw on many of the references in HEE's Guidelines for Commissioning Technology Enhanced Learning[11].

5.4 Learning design

As with the design of any new course, a formal learning design process should be followed to ensure learning outcomes are linked to an appropriate learning method and that appropriate online pedagogies are followed. The ABC Learning Design framework, for example, developed at University College London is shared under a creative commons licence and is in widespread use across the higher education

sector[12] as well as being adopted by education providers such as FutureLearn. Other learning design frameworks may also be appropriate to use for the development and planning of learning delivery.

5.5 Reuse and sharing of content

As part of this learning design process, consideration should be given to the reuse of existing learning materials where possible. The Learning Hub, developed by HEE, has an extensive catalogue of existing learning resources shared under Creative Commons licences enabling the reuse and repurposing of content. Educators are encouraged to share their resources via the Learning Hub as well, so that others may benefit from their developments.

In addition, institutions may choose to direct students to existing content on the elearning for healthcare Hub which contains an extensive catalogue of quality assured content, built in conjunction with professional bodies.

The Association for Learning Technology supports the OER (Open Educational Resource) approach to learning and where possible, education providers should consider open licence to promote a culture of sharing.

5.6 Project management

A suitable project team, some of whom may be accredited by the Association for Learning Technology, is critical to the implementation of new technology and innovation. Consideration should be given to involving a project manager, learning technologist, subject matter expert and an educationalist as a minimum. It is also important to ensure that the student voice is incorporated.

5.7 Student and educator digital capabilities

One of the key aims of HEE's Blended Learning Programme is enabling students to "learn on their own terms and remove some of the barriers to education" by using digital technologies[10]. As such, students can expect a wide variety of technologies to be used in the delivery of the blended curriculum and consideration should be given to the digital literacy of students and those that teach them. The readiness of learners to use technology in their learning should also be explored.

When designing the learning, institutions should refer to the JISC Digital Capability framework for teaching staff.[13] and to the HEE digital capabilities framework for students.[14] These documents provide a framework for supporting staff and students to adopt and adapt to online learning delivery. The frameworks both cover areas such as online research and staying safe online as well as digital wellbeing. Students may need support to get started with online study, while the higher education workforce may need support to adapt to new ways of working.

5.8 Student and faculty wellbeing

While wellbeing is covered in the HEE digital capabilities framework, it is important to consider this separately due to the impact isolated working can have on student and faculty mental wellbeing. The great benefit of blended learning is the ability to study asynchronously but that also brings the potential for lack of peer support. Education providers should put mechanisms in place to manage isolation caused by technology.

In particular, immersive experiences have the potential to trigger lived experiences, where a student may previously have encountered a challenging or traumatic experience. Support needs to be put in place to care for these student's mental health.

5.9 Barriers to accessing technology

Access to technology is not always equitable and restrictions such as availability of equipment, Wi-Fi, sufficient bandwidth may disadvantage certain students. Mechanisms should be put in place to prevent this. Lafferty, et al produced a paper for HEE outlining the key considerations regarding access to technology in healthcare education.[15] The barriers to access broadly fall into three categories, plus the digital literacy of students and teachers

5.9.1 Ergonomics (including digital literacy):

- Digital literacy capabilities and willingness to embrace TEL
- Time to undertake TEL
- Acceptability of devices
- Physical spaces for learning

5.9.2 Technical factors:

- A suitable device
- A network of suitable speed to connect the device, whether wired or wireless
- Access to websites providing and supporting TEL
- A suitable browser
- Other software and hardware required by TEL

5.9.3 Collaboration and information exchange:

- Tools and software to support collaborative working
- Information governance policies that support safe collaboration and exchange of information

5.10 Accessibility

In addition to the legal requirement of designing accessible learning to ensure that everyone has fair and equitable access to content, regardless of any physical or cognitive impairment. Examples of impairments that may require adaptions to be made include vision problems such as macular degeneration or cognitive impairments like dyslexia. For example, making video content accessible for someone with visual problems, may include providing a transcript or adding subtitles.

It is particularly important to provide accessible alternatives to immersive technologies. As many as 25% of users of virtual reality report nausea during the use of a headset, so it is important to offer an alternative such as accessing the content through a web browser.

5.11 Ethical considerations

The ethics of online education should be considered as it is critical to providing inclusive and safe blended learning education. This needs to be explored through various perspectives; the learner, the educator and the technology being used.

For all learning materials that are developed, ethics need to be considered to ensure that learning technology does not discriminate, ensures confidentiality and enables learners to act responsibly. This is particularly true when considering the implementation of any AI or machine learning as poor design can lead to biased algorithms that may actively discriminate.

Other ethical considerations for the use of innovative technologies in the delivery of education include the blurring of boundaries between educators and students in relation to communication and privacy and diversity.[16,17] Further areas for consideration include equality of access to diverse groups, and learners' freedom

and blurring the lines between students and instructors' ethical rights[17,18]

There are other ethical issues for exploration including the use of copyright protected materials and helping people with disabilities in getting access to online opportunities, professionalism
and conflicts of interest of learners' needs and goals.[18]

There are several proposed solutions – communication, law and policies, maintaining professional integrity and using the right technical solutions. The Framework for Ethical Learning Technology FELT offers guidance to support individuals, organisations and industry in the ethical use of learning technology across sectors[19]

5.12 Technology standards

It is not possible to include technical standards for every type of TEL solution within this document, so this section provides an overview of the key minimum standards. As discussed previously, consideration needs to be given to the most appropriate delivery method and most appropriate technology based on the desired educational outcomes whilst considering the audience abilities and their access to technology.

5.13 Learning Management System/ Virtual Learning Environment

The Learning Management System (LMS) should be the primary gateway for students to access their learning, tutor support, learning records and other information such as their placement schedule. While the LMS should offer a range of TEL materials, the minimum technical standard that should be supported is SCORM 1.2 to enable shared content objects to be reused and distributed across other platforms. Ideally, more modern LMS should support CMI5 and xAPI to support the sharing of content and capture of learner data in a common format.

5.14 The learning ecosystem

Not all learning takes place in the Learning Management System (LMS), such as accessing informal learning resources and accessing the evidence base, including online journals. While the LMS may be the primary place to access course materials, a learning experience platform (LXP) offers the ability to provide integrations and capture learning activity from across the "ecosystem".

This approach enables a joined-up delivery of learning across clinical placement, formal and informal education activities. For example, compliance training or learning conducted during clinical placements should ideally integrate with the full learner record to capture the continuum of learning, integrating with e-portfolio systems to offer a lifelong learning record and act as a "passport" when moving between clinical placements.

5.15 Data and interoperability

The LXP offers a wide range of options to integrate with third party systems, so consideration should be given to the support for multiple learning standards, such as those endorsed by IMSGlobal (https://www.imsglobal.Org/) including SCORM, CMI5 and LTI. The LMS platform should also support a wide range of open application programming interfaces (APIs) to enable integration with the widest possible range of other platforms.

Examples include, but are not limited to, Oauth2 for single sign on, xAPI for data interoperability and "AI-ready" data standards,

RSS for ingestion of content into third party content management systems.

5.16 Simulation-based education standards

HEE have published several Simulation-based education (SBE) guidelines to support the delivery of simulation in healthcare settings. Most notably, the national framework for SBE offers 5 principles for ensuring fair and equitable access to simulation as well as delivering a high quality experience.[20] In addition, HEE's strategic vision for simulation focuses on the frameworks around pedagogical effectiveness of immersive technologies, and a toolkit of case studies and resources to support evidence based application of simulation and developing local competence for content creation.[21]

5.17 Learning authoring tools

Learning authoring tools are many and varied and the precise tool chosen will depend on the desired outcomes. However, authoring tools broadly fall into 4 categories:

- Elearning authoring tools – this software typically offers the ability to develop interactive elearning modules or complete courses that can be output into HTML or SCORM for use directly in an LMS. Prominent examples of these tools include Lectora, Captivate and Adapt. Many tools now offer responsive design as standard to minimise the need to build separate mobile versions of learning or apps. Given the huge variety of media that can be embedded in elearning or considered stand alone as elearning, the choice of tools will depend on the local needs but a good resource of free and open source learning authoring tools is maintained at Free tools for trainers.

- VR authoring tools – The Learning Hub contains a range of "how to" guides for creating VR and immersive technologies, focusing on the production process as well as the editing and publishing to a LMS for use in VR headsets or a web browser. A prominent example of an open source VR JavaScript framework is A-frame. However, there are now authoring tools which offer a more intuitive drag and drop interface such as CenarioVR.

- AR/XR authoring tools – development of mixed reality graphics requires a specialist graphic design skillset but there are freely available tools to support the development of graphics such as the open source Blender tool, or Unity also offer a free toolkit for educational purposes.

- Simulation script authoring tools – simulation also requires a specialist skillset for facilitating and the technical delivery of scenarios. A prominent example of a collaborative simulation scripting tool is iRIS.

5.18 Devices and equipment

For most learning delivery, standard devices such as laptops, tablets or mobile phones should suffice and due to accessibility requirements, all the learning materials should be capable of running on such equipment. However, to replicate the healthcare environment, specialist equipment may be necessary.

Simulation equipment – this may include full size manikins for practising clinical procedures or may just include specific body parts for specialist clinical procedures such as thoracic surgery. There are a huge number of simulators on the market. The Learning Hub contains a range of "how to" guides on how to

facilitate simulation training and the equipment required for certain procedures.

Virtual Reality Devices – VR devices range from very low-cost equipment such as Google Cardboard headsets which uses the student's own mobile device as the display, to mid-range devices for a better quality experience such as the Oculus Quest, and high cost devices such as the HTC Vive that require a high power laptop for running more intensive scenarios.

6.0 Cost and funding

There is a broad based understanding that developing blended learning programmes requires significant infrastructural investment. However, the cost of delivery is mixed with indication of higher cost in some instances.[22] and perceived lower

cost in other cases.[23] The difference in cost can be attributed to design and preparation of materials, resources, activities, teaching and support.[24]

The expense is course design, building new courses with new types of engagements, conversations and assessments for online environments.[22] Healthcare professional education is resource intensive and relies on public subsidy to supplement student tuition fees.

The high costs of delivery are true across different funding routes such as traditional university-based programmes and apprenticeship programmes. Blended learning programmes are not cheaper to deliver. The Council of Deans of Health and Universities UK believe that blended learning programmes should be funded at the same level as university-based programmes.

Fees and learning support

Students will be eligible for full student support funding on the various blended learning programmes.

It is key that as these programmes become widespread, the cost for development and delivery is interrogated further to ensure sustainability.

7.0 Evaluation

Evaluating the effectiveness of blended learning requires a multi modal approach with consideration for various stakeholders and factors such as political, economic, social, technological, environmental, legal and ethical. Frameworks to evaluate the effectiveness of blended learning such as Web-Based Learning Environment Instrument (WEBLEI), Hexagonal eLearning Assessment Model (HELAM), ELearning framework; Technology Acceptance Model (TAM), Rubric-based frameworks focus on different aspects of the provision.[6]

As the literature on the effectiveness of blended learning in health education continues to evolve, it is critical that any evaluation is all encompassing to ensure that interdependencies between the various stakeholders and factors are not lost.

Comprehensive evaluation of blended learning healthcare education will provide crucial contribution to the emerging evidence. To ensure a consistent approach to evaluation, the programme will draw on various evaluation frameworks to ensure that various aspects and factors have been evaluated to identify interdependencies between them.

8.0 Recommendations

Effective delivery of blended learning healthcare professional education requires commitment and a concerted effort by various parts of the system, Department of Health and Social Care, Health Education England, higher education institutes, practice learning providers, regulators, professional bodies, and councils. We know that these identified system partners are already invested in the use of blended learning approaches for healthcare education.

This report has been developed independently, however recommendations in Barber's recently published report is timely and applicable to other audiences targeted in this report, other than higher education institutes[2].

All system partners need to work together to ensure:

- investment in the right technology to support faculty in designing and delivering programmes for the expected educational outcomes
- access to devices and internet is assessed so that policies, funding and support is provided to individuals and organisations
- learners and educators have access to a variety of high quality collaboratively funded simulation and other innovative technologies. Investment in developing a robust evidence-base for blended learning through various mechanisms, including literature and evidence reviews, evaluation, national and international knowledge exchange seminars and primary research

Department for Health and Social Care (DHSC) and Department for Education (DfE)

- DHSC and DfE to review current policy and arrangement for student support funding to ensure that blended learning healthcare students can fully access funding despite flexible programme start dates.

Regulators

- Regulators to review of current regulatory standards and make changes where evidence supports the effective use of innovative technologies in the delivery of theoretical and practice learning in the development of safe practitioners.

Professional bodies and councils

- Professional bodies and councils should review current professional standards and make changes where evidence supports the effective use of innovative technologies in the delivery of theoretical and practice learning in the development of safe practitioners.
- Councils to support their members developing and delivering blended learning programmes and collaborate with other system partners in the development of policies and investment strategies for blended learning provision.

Health Education England (HEE)

- HEE to work with industry and other key stakeholders to produce evaluation frameworks and strategies for the use of digital and learning technologies in delivery of blended learning.
- HEE to collaborate with key system partners to commission blended learning programmes

for various health professional education training.

Higher Education Institutes (HEI) should ensure:

- the digital literacy levels of prospective students should be established and interventions offered before enrolment and courses should be designed so that development of digital literacy is part of the course delivery

- prospective students have been assessed for readiness to learn using a blended learning approach

Practice learning providers should ensure:

- Learners should be provided with access to digital literacy tools and learning resources available to staff in health and social care settings

- Collaboration with higher education institutes and utilise a variety of practice learning tools to ensure full utilisation of capacity and practice learning opportunities.

9.0 Conclusion

Blended learning approaches provide opportunities to widen access to tertiary education for many people from diverse backgrounds, however full benefits can only be realised with thoughtful implementation.

While there are great opportunities for its use, there are individual, organisational and systemic challenges that require attention to enable effective use of the approach.

Flexibility permitted for the use of emerging technologies and simulation in the delivery of practice learning is varied however, there is evidence of active steps being taken by some regulators and professional bodies to explore the potential to extend use.

There is also a requirement for consistent strategic investment at many levels by system partners to support the use of technologies in the development and delivery of contemporary health professional education.

To achieve optimal outcomes, it is crucial for educators, practice placement providers, regulators and leaders from the various parts of the education and health systems to work together to promote the blended learning approach, by addressing issues that creates challenges or barriers.

Table. 1

Summary of key features of the AHP curriculum guidance and standards.

	Pre-registration routes	Outcome based	Placement hours expectation	Simulation
British Association of Art Therapy	MA/MSc 2-year FT or 3-year PT	No	120 days (approx. 950 hours)	No restriction
British Dietetic Association	BSc (Hons) MSc Apprenticeship	Yes	Min 1,000 hours	Should not exceed 350 hours
The British Association of Drama Therapists	MA	No	100 sessions (100-200 hours approx.)	No restriction
British Association for Music Therapy	MA/MSc full/ part time	No	35 – 72 days	No restriction, simulation is a common feature.
Royal College of Occupational Therapists	BSc (Hons) FT/PT MA/MSc 2-year FT or 3-years PT PGDip Apprenticeship	Yes	Minimum 1,000 hours of successful practice-based learning (as required by the World Federation of Occupational Therapists)	If considered a component of the practice-based learning hours, simulated learning must be assessed, must not exceed 40 hours
College of Operating Department Practice	BSc (Hons) Apprenticeship (Dip HE)	Yes – detailed competences	50:50 theory to practice	No restriction however, the emphasis must be on the quality of the simulation content regardless of the type of simulation used. It would not be appropriate to use simulation as a method for teaching and assessing aspects of clinical learning where real experience is available.
British and Irish Orthoptic Society	BSc (Hons)	No	30-37 weeks (approx. 1,000 hours)	No restriction
College of Paramedics	BSc (Hons) Apprenticeship (CertHE equivalent)	Yes	50:50 theory to practice	Simulation should not exceed more than 10% of practice time

	Pre-registration routes	Outcome based	Placement hours expectation	Simulation
College of Podiatry	BSc (Hons) MSc Apprenticeship	No	1,000 hours – flexible about how much needs to be patient facing	No restriction
Chartered Society of Physiotherapy	BSc (Hons) MSc D Apprenticeship	Defines broad learning outcomes	Minimum 1,000 hours	Simulation not normally allowed to replace placement hours (currently relaxed because of COVID-19)
British Association of Prosthetists and Orthotists	BSc (Hons)	Yes	Not detailed currently varies approx. 1,200 hours	No restriction
College of Radiographers	BSc (Hons) MSc Apprenticeship	Yes	Does not stipulate number of hours as outcome based. Across education providers this currently varies approx. 1,200 hours	No restriction
Royal College of Speech and Language Therapists	BSc (Hons) MSc Apprenticeship (under development)	Defines graduate capabilities	150 sessions – 562.5 mandatory 375 hours must be overseen by SLT 25% of 375 must be direct client centred	281.25 can be delivered through simulation/other practice-based learning opportunities
The Institute of Osteopathy	MSc (4-year)	Yes	Not detailed – approx. 1,000 hours	No restriction

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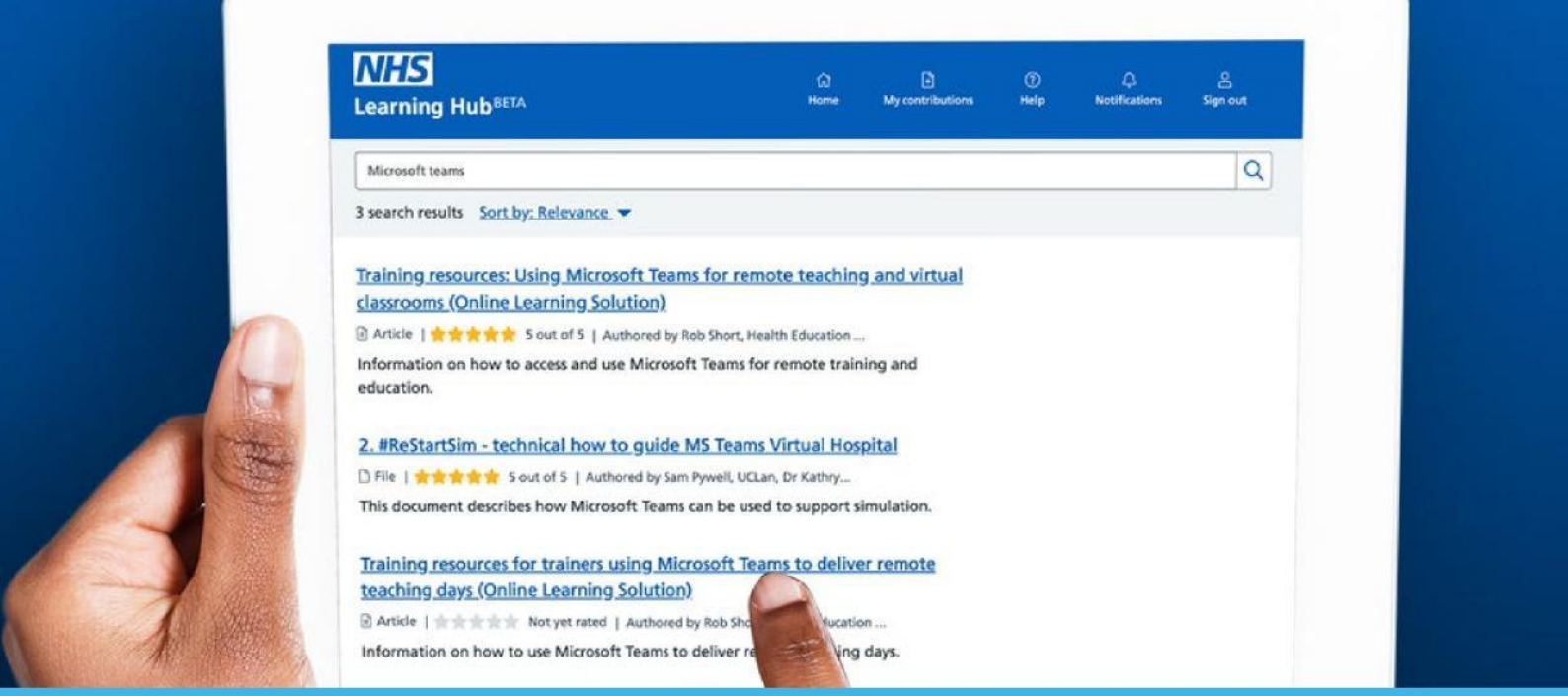

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Glossary

These are definitions of blended learning and some of the most common learning methods considered in this document. It is by no means a comprehensive list but illustrates the diversity of learning delivery methods.

Technology Enhanced Learning methods

- **Elearning** is a collective term used to describe a wide range of different learning technologies but is most typically applied to short online courses delivered online through a web browser. Examples include modular learning content delivered through a virtual learning environment (VLE).

- **Gamification** is the application of game-design elements and game principles in an educational context. Examples include leader boards and motivational techniques based on audience participation

- **Mobile learning and apps,** also referred to as m-learning is learning designed specifically for delivery through a mobile device and includes mobile applications. Examples include podcasts and performance support apps.

- **Technology Enhanced Learning (TEL)** is a term used to describe technologies and techniques that can enhance the delivery of education and training.

- **Video/360 video** is media in digital format, displayed on a screen. Typically, this is filmed with a standard single-lens camera but can be filmed on a stereoscopic camera to provide the illusion of depth and 3 dimensions when played back through a virtual reality headset. 360-degree video is captured using a special camera that contains an array of lenses that capture all angles of a scene. Examples include screen captures of software or scenarios involving actors.

- **Volumetric content** is a type of video that captures three-dimensional space and presents the content as a graphical model. This is typically a three-dimensional graphical representation but with specialist recording equipment can capture real-life people or objects.

- **Emergency remote teaching and learning** is where all teaching and learning is

rapidly moved to delivery in a digital environment. There may be some redesign of teaching and learning for delivery in a digital environment but this is more limited than it would have been in a 'normal' context.

- **e-portfolio** systems are used to capture details of activities completed and competence against those activities, often against a competency framework. An e-portfolio system is often independent of the LMS but may interact with it by capturing completion.

- **Immersive technology** is a type of SBE and a collective term used to describe virtual reality (VR), augmented reality (AR) and mixed reality (XR):

  - **Augmented Reality (AR)** is an enhanced version of reality created using technology to overlay digital information on an image of something being viewed through a device. An example of augmented reality is for use in anatomy teaching where labels or graphics of the human body are overlaid on top of the real world.

  - **Mixed Reality (XR)** incorporates both virtual and augmented reality, supported using haptics and even smell.

  - **Virtual Reality (VR)** is a computer simulation of a real or imaginary world or scenario, in which a user may interact with simulated objects or living things in real time. Examples include fully immersive scenarios and 360 videos.

- **Informal learning** is learning that takes place independently and typically outside of any formal learning environment or curriculum. This may incorporate elements of social learning where participants share resources or learning with others. Examples include YouTube video, journal articles and other resources not explicitly delivered by a VLE.

- **Learning management systems (LMS),** also called a Virtual Learning Environment, are the systems that students interact with to access their learning materials. Learning is tracked through the LMS and a tutor or administrator can manage courses through a content management system, and manage participants as required. Increasingly, these LMS are coordinating the activities happening around the learning ecosystem, not just content delivered or managed directly in the system, often referred to as a Learning Experience Platform (LXP).

- **Machine Learning (ML)** is a type of Artificial Intelligence (AI) that uses data to make decisions. In education, this typically involves using learner data to provide adaptive and personalised learning.

- **Simulation-Based Education (SBE)** is a technique to replace or amplify real experiences with guided experiences, often immersive in nature, that evoke or replicate substantial aspects of the real world in a fully safe, instructive and interactive fashion.

- **Social learning/discussion** is typically delivered asynchronously where participants take part at a time convenient to them, using discussion forums and social media to interact with other participants. Examples include MOOCs and Twitter chats.

- **Virtual Classrooms**. Synchronous learning is typically delivered in real-time using video conferencing tools or sophisticated virtual classrooms that supplement didactic delivery with polling, chat and other audience participation tools. Recordings of sessions may be made to deliver the learning asynchronously if a participant is unable to attend live.