

An investigation into specialty trainee engagement with e-learning

ABSTRACT

Aim: The objectives of this study were to determine paediatric specialty trainees' engagement with e-learning in Health Education England North West and the characteristics of sites accessed by specialty trainees, and to assess the quality of web interfaces being used and whether this aligns with the best evidence for e-learning provision.

Methods: A two-phase mixed methods design was used: a scoping exercise to elicit specialty trainees' preferred e-learning tools and a quality assessment of the named sites, and specialty trainee telephone interviews.

Results: A total of 135 respondents identified 86 sites. Quality assessment found considerable variation across sites and a number of barriers to access, one issue being uncertainty about quality and validity of sites.

Conclusions: E-learning is viewed as an integral part of both mandatory and speciality training but there is considerable variation in access to and quality of sites. Specialty trainees value the convenience and breadth of e-learning available but express concerns about assessing the validity and legitimacy of such sites.

Research questions

The mixed method approach takes a pragmatic perspective (Creswell, 2003). The research design adopted a 'what works' approach in order to answer the research questions (Morgan, 2007) which were:

- How do paediatric specialty trainees engage with e-learning?
- What are the characteristics that specialty trainees feel contribute to a valued e-learning package?
- To what extent do sites used by paediatric specialty trainees follow best practice models of e-learning?
- Are the sites identified by trainees of a high quality and do they align with the best evidence for e-learning provision?

Methods

Sample

The study population comprised all 420 paediatric specialty trainees (ST1–8) in one specialty school in the north west of England.

Data collection

In phase one, participants received an email from their specialty school administrator inviting them to complete an online questionnaire. The questionnaire asked participants to give their level of training and details of up to five paediatric e-learning packages or resources that they have used in their specialty training or that they are aware of but have not had the opportunity to use. Responses (free text) were downloaded and stored in a spreadsheet.

In phase two, semi-structured telephone interviews were carried out with participants who had completed the online questionnaire and then volunteered to take part in the qualitative phase. Interviewees were asked to consider the impact of e-learning on their specialty training and what aspects of e-learning packages they particularly appreciate and value. All interviews were audio recorded (with consent) and transcribed.

Previous work on learner engagement with e-learning has often focused on undergraduate medical education or advanced nursing training. The gap is in specialty trainee e-learning. This article explores paediatric specialty trainees' engagement with e-learning, the characteristics of sites accessed by specialty trainees and the quality of the provision. The research team deliberately used a broad definition of e-learning to include any learning, formal or informal, which is accessed via the internet (Department of Health, 2011).

It is important that specialty schools and their trainees are provided with guidance

on e-learning packages and whether they are likely to be beneficial for them. This is especially the case when it is notoriously difficult to assess the cost effectiveness of medical education interventions (Walsh et al, 2013). With the ever-increasing number of e-learning packages available there is a threat that precious time can be wasted searching for high quality e-learning packages that may just become lost under the sheer quantity of choice. The need for guidance was raised by Prince et al (2010) who argued that there is a significant risk that enthusiastic learners will find it hard to access appropriate educational materials within the burgeoning number of sites. Krishnan et al (2017) also point to a lack of reliability when users were asked to assess the quality of online medical education. This is set into context as Sandars and Lafferty (2010) emphasized the importance of usability testing when developing e-learning web pages in medical education.

The Royal College of Paediatrics and Children's Health encourages online learning as an important part of continuing professional development for specialty trainees and their website promotes a range of e-learning sites. The College is also involved in the development of specialty trainee e-learning content for the e-learning for healthcare site.

Professor Jeremy M Brown, Professor of Clinical Education, Postgraduate Medical Institute, Faculty of Health and Social Care, Edge Hill University, Ormskirk L39 4QP

Dr Karen Kinloch, Research Assistant, Evidence-based Practice Research Centre, Faculty of Health and Social Care, Edge Hill University, Ormskirk

Professor Nigel J Shaw, Consultant Neonatologist, Department of Neonatal Care, Liverpool Women's NHS Foundation Trust, Liverpool

Correspondence to: Professor JM Brown (brownjm@edgehill.ac.uk)

Ethical approval

Ethical approval was received from the university faculty's research ethics committee and Health Education England North West's research and innovation committee.

Analysis

Phase one

Descriptive statistical analysis was undertaken on the questionnaire responses. Details of e-learning sites were downloaded and manually sorted and duplicates removed.

The resources identified by participants were categorised using a proforma, assessed against 11 criteria for the transparency of the website (Jacobs, 2012) and six principles that underpin the Department of Health's (2011) Framework for Technology Enhanced Learning. Key areas of concern were developed from the results of the quality assessment.

Phase two

The interviews were subject to thematic framework analysis (Ritchie and Lewis, 2003). Familiarisation with the data was achieved by listening to audio recordings while reading transcripts. To enhance the rigour of the findings, two researchers (JB and KK) independently analysed the interviews and developed an initial set of themes and subthemes. The whole research team then collaborated to code the data according to these themes (Miles and Huberman, 1994).

Results

Phase one

Quantitative data

A total of 135 paediatric specialty trainees completed the survey, giving a 32% response rate distributed across ST1–8 as shown in Figure 1.

Figure 2, broken down by specialty level, shows that 67% ($n=91$) of respondents indicated that they have used e-learning resources while 33% ($n=44$) of respondents did not name any e-learning resources (suggesting non-engagement with e-learning). Four of the respondents who did not list any sites explicitly stated that they were unaware of any e-learning resources for paediatric training.

A list of websites which were accessed and not accessed are shown online (www.bjhm.co.uk) in Appendices 1 and 2. Details of 86 unique sites were retrieved from the survey responses. Sixty-three (73%) sites named

were developed or validated by the Royal College of Paediatrics and Children's Health. The most frequently accessed sites were Royal College of Paediatrics and Children's Health, e-learning for Healthcare, British Medical Journal, Advanced Life Support Group and Advanced Paediatric Life Support, and the most common topics include prescribing, safeguarding and child protection, lifesaving and resuscitation.

Quality assessment

While the original definition of e-learning was deliberately broad, for the quality assessment only sites which provided modular e-learning (as opposed to reference sites or exam revision) were assessed for quality using the proforma in Appendices 3a and b. Results and commentary from the quality assessment are shown in Appendices 3a and b.

There were 11 websites which provided one or more modular e-learning programmes. As modules on the same website were on occasion constructed in different ways, rather than the module 'platform' being assessed as a whole, different modules on the same website platform were assessed separately, resulting in 18 modules being assessed. Other websites reported were sites of official organizations (six), reference sites (six) and sites requiring membership of an organization or payment for access (17). None of these were scored according to the proforma. Twenty-two other websites were reported whose names were not specific enough to enable them to be found and two websites no longer existed. This assessment identified three key areas of concern: lack of peer review, unclear referencing of material and lack of transparency around third party involvement in funding sites.

Figure 1. Distribution of respondents by specialty training level.

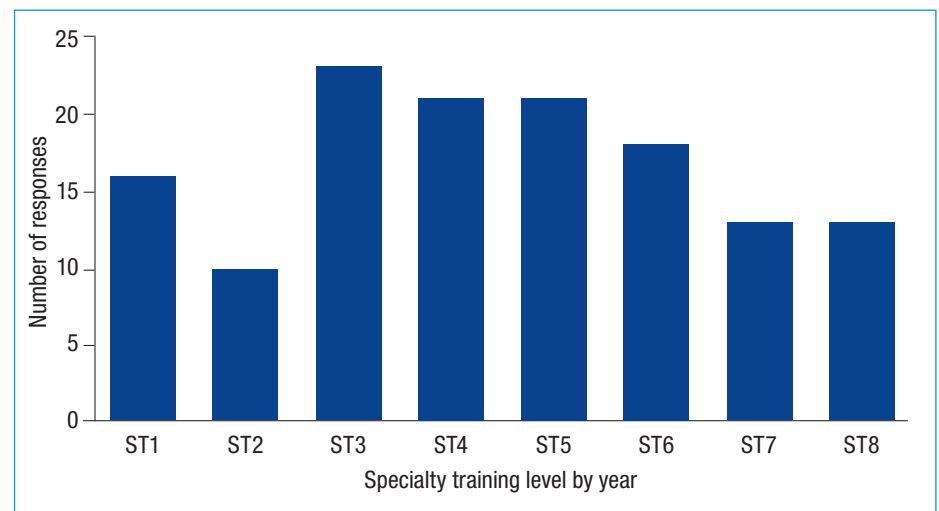
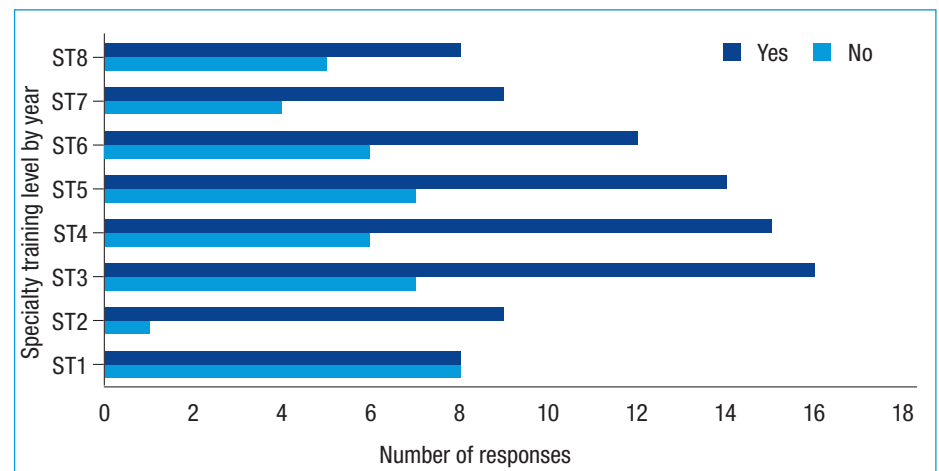


Figure 2. The number of trainees at each ST level who have or have not used any e-learning sites ($n=135$).



Using the Department of Health guidance the websites were found to be of high quality with the only area for concern being the quality of the evidence base.

Phase two

Qualitative data

Ten trainees were interviewed. From a thematic framework analysis of the transcribed interviews two key themes were developed by the research team:

1. Uncertainty about sourcing quality sites (subthemes included lack of time to look)
2. Needing more signposting from the College (communication issues).

Theme 1: resource uncertainty: Despite the trainees' willingness to engage with e-learning, considerable uncertainty was shown about how to find appropriate sites and 8 out of 10 trainees made reference to this.

'How do you whittle out what's worth sitting through and what's not, you know, that kind of thing; it's very difficult especially when you first start.' (specialty trainee participant (STP) 9)

'If there were ones that were relevant and available and we [were] all aware of and we had time built into our job plans for portfolio and we knew which e-learning module were relevant and available to us, then I think some trainees would put the time aside to do them.' (STP 5)

Several trainees felt that some form of standardized curation or database of learning would be welcome.

'In my old training job, we just had a huge bank that we could choose from, and some were compulsory and some weren't.' (STP 4)

'So actually having sort of standardised e-learning packages throughout the country where everybody can access the same sort of material would be really good.' (STP 1)

'I don't think there's really like a good database where you can pick different topics to go through.' (STP 7)

The ability of trainees to source and validate e-learning materials was also related to a more general issue of lack of time for learning.

Theme 2: the value of the College:

Although trainees expressed uncertainty about sourcing appropriate e-learning sites, the College-endorsed materials found from the Royal College of Paediatrics and Children's Health website were held up as good examples of relevant and useful e-learning.

'I think if there are e-learning packages that are endorsed by the College then they're probably going to be more relevant and useful.' (STP 5)

'Obviously they're [Royal College of Paediatrics and Children's Health] in charge of the curriculum, so you can rely on whatever they're offering – it is relevant and what you need to know.' (STP 3)

Trainees explained they would value more communication from the Royal College about e-learning resources available to them.

'Usually the Royal College or the postgraduate people send us information, but, I've got to be honest, we don't get it very often. I wouldn't say that they are pro-e-learning, you know; we don't really get sent that much, and it's not that easy to access.' (STP 4)

'I'd only just found on the Royal College of Paediatrics and Children's Health website e-learning modules, because I'm doing my exams because it wouldn't necessarily be the first place that I would go to learn something that I'm interested in which is sad because they're my college.' (STP 6)

Discussion

The authors investigated paediatric specialty trainees' engagement with e-learning, the characteristics of sites accessed by specialty trainees and the quality of the provision. The survey response rate of 32% was in line with current evidence of online questionnaire response rates (Cunningham et al, 2015). Responses also represented wide coverage of specialty trainee levels.

E-learning is viewed by specialty trainees as an integral part of both mandatory and speciality training but there is considerable variation in access to and quality of sites. This

mirrors similar findings reported by Fraser et al (2011) regarding ear, nose and throat specialty trainees 7 years ago.

It comes as no surprise that the Royal College of Paediatrics and Children's Health is viewed as a credible educational resource. These findings demonstrate that the Royal College of Paediatrics and Children's Health has a valuable role to play in promoting its own and other trustworthy sites to offer reassurance to specialty trainees that educational resources are valid and reliable. Specialty trainees value the convenience and breadth of e-learning available but express concerns about assessing the validity and legitimacy of such sites and would value signposting and formalized quality assessment from the College. When there are time restraints as a result of service pressures any guidance from trusted sources such as Health Education England or the College on high quality e-learning resources would be welcomed.

Analysis reported here demonstrates that some e-learning resources have relatively poor peer review processes and this leads to uncertainty about the credibility of referenced editorials and articles compared, for example, to Cochrane reviews. This highlights the importance of transparency of affiliations and direct funding to reduce uncertainties around potential conflicts of interest. Good quality e-learning resources take time and money to produce and cost effectiveness is important. The large number of sites available might reflect low cost 'quick-fix' sites which may, at best, be less reliable in terms of information for assessment and at worst provide ambiguous advice which carries the possibility of having a knock-on effect for quality of patient care. Some of these sites may be developed by an individual or small group and therefore, owing to difficulty in upkeep, may be prone to going out of date or becoming unusable.

Conclusions

To maximize quality engagement with e-learning in the paediatric specialty trainee population, communication from the Royal College of Paediatrics and Children's Health needs to be frequent and timely with the emphasis on the evidence base of e-learning provision. **BJHM**

The authors would like to thank the paediatric specialty school department for helping to distribute the online survey and all the specialist trainees who participated in the study.

KEY POINTS

- E-learning is viewed by specialist trainees as an integral part of both mandatory and speciality training but there is considerable variation in access to and quality of sites.
- Some e-learning resources have relatively poor peer review processes, which leads to uncertainty about the credibility of referenced editorials and articles.
- Specialist trainees value the convenience and breadth of e-learning available but express concerns about assessing the validity and legitimacy of such sites.
- When there are time restraints as a result of service pressures any guidance from trusted sources such as Health Education England or the Royal College of Paediatrics and Children's Health on high quality e-learning resources would be welcomed.

Ethical approval: This study was undertaken in compliance with university and Health Education guidelines and the appropriate institutional committees approved the project. Conflict of interest: none.

- Creswell JW. 2003. *Research Design: Qualitative, Quantitative and Mixed Methods Approaches*. London: Sage Publications. 2nd edn.
- Cunningham CT, Quan H, Hemmelgarn B et al. Exploring physician specialist response rates to web-based surveys. *BMC Med Res Methodol*. 2015 Apr 9;15:32. <https://doi.org/10.1186/s12874-015-0016-z>
- Department of Health. 2011. *A Framework for Technology Enhanced Learning* (accessed 16 December 2018) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/215316/dh_131061.pdf
- Fraser L, Gunasekaran S, Mistry D, Ward VMM. Current use of and attitudes to e-learning in otolaryngology: questionnaire survey of UK otolaryngology trainees. *J Laryngol Otol*. 2011 Apr;125(4):338–342. <https://doi.org/10.1017/S0022215110002793>
- Jacobs JJ. 2012. How to find a web interface for successful education. *Med Teach*. 2012;34(9):748–750. <https://doi.org/10.3109/0142159X.2012.687491>
- Krishnan K, Thoma B, Trueger N, Lin M, Chan

- T. Gestalt assessment of online educational resources may not be sufficiently reliable and consistent. *Perspect Med Educ*. 2017 Apr;6(2):91–98. <https://doi.org/10.1007/s40037-017-0343-3>
- Miles MB, Huberman AM. 1994. *Qualitative Data Analysis*, Thousand Oaks, CA: Sage Publications. 2nd edn.
- Morgan DL. 2007. Paradigms lost and pragmatism regained: Methodological implications of combining qualitative and quantitative methods. *Journal of Mixed Methods Research*. 1(1): 48–76.
- Prince NJ, Cass HD, Klaber RE. Accessing e-learning and e-resources. *Med Educ*. 2010 May;44(5):436–437. <https://doi.org/10.1111/j.1365-2923.2009.03614.x>
- Ritchie J, Lewis J, eds. 2003. *Qualitative research practice*. London: Sage Publications.
- Sandars J, Lafferty N. Twelve Tips on usability testing to develop effective e-learning in medical education. *Med Teach*. 2010;32(12):956–960. <https://doi.org/10.3109/0142159X.2010.507709>
- Walsh K, Levin H, Jaye P, Gazzard J. Cost analyses approaches in medical education: there are no simple solutions. *Med Educ*. 2013 Oct;47(10):962–968. <https://doi.org/10.1111/medu.12214>

Clinical Teaching Made Easy

- Covers all areas of health professions' education including appraisal, supervision, career development, e-learning etc.
- Draws on the experience of well-regarded clinical teachers to highlight practice points.
- Highly practical as theory is related to teaching and learning practice in the clinical context.
- Easy to follow format with key points and diagrams.

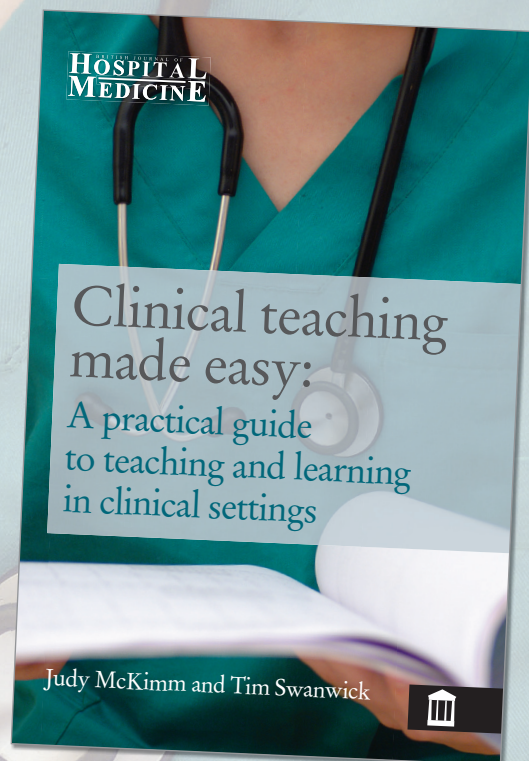
Judy McKimm, MBA BA (Hons) Cert Ed FHEA FAcadMed was Director of Undergraduate Medicine at Imperial College London until 2004.

Tim Swanwick, MA MBBS DRCO G DCH FRCGP MA (Ed) FAcadMed is currently Director of Professional Development in the London Deanery.

ISBN-13: 978-1-85642-408-0; paperback; publication: 2010; 250 pages; RRP £22.99

'This book will be useful to all who are involved in postgraduate medical education, not just the professional educators but also the individual clinical and educational supervisors within their respective departments.'

British Journal of Hospital Medicine



Order your copies by visiting
www.quaybooks.co.uk

or call
01722 716935

Appendix 1. Listed websites accessed by researchers

Websites accessed by researchers	Submodules reported by participants
NHS Health education England e-learning for healthcare	Adolescent medicine, blood transfusion, child protection, safeguarding children, healthy child programme, leadership and management for clinicians, awareness of female genital mutilation
Royal College of Paediatrics and Child Health (and Compass) website	E-prescribing, healthy child, vaccines in practice, meningitis, Head Smart, Advanced Paediatric Life Support virtual learning environment, Paediatric Care, Online, Child Protection in Practice, Mind ed
BMJ Learning website	Blood transfusion module
Other websites	<ul style="list-style-type: none"> ■ Good Clinical Practice via National Institute for Health Research ■ PCGE Medical education diploma / cert / leadership modules Edge Hill University ■ Doctors.net learning modules ■ Spotting the Sick Child ■ Don't Forget the Bubbles ■ LearnPro NHS ■ NHS diabetes e-learning ■ https://neonataltips.wordpress.com/ ■ St Emlyns ■ Open Paediatrics (Harvard) ■ http://www.pmmonline.org ■ Univadis ■ Medscape
Sites that are reference sites only	<ul style="list-style-type: none"> ■ Diabetes / insulin UK ■ British Medical Association ■ Childrens' British National Formulary ■ Newborn and Infant Physical Examination ■ National Institute for Health and Care Excellence ■ sims.cf.ac.uk ■ Toxbase ■ Asset ■ Eportfolio ■ World Health Organization breastfeeding

Appendix 2. Listed websites not accessed by researchers

Websites not accessed by researchers	Submodules reported by participants
Sites requiring enrollment on course and/or payment	<ul style="list-style-type: none"> ■ Advanced Life Support Group / Newborn Life Support ■ Learning 'passport' for North West ■ Local Trust intranet / elearning ■ Generic Instructor Course ■ Pastest ■ UpToDate ■ British Paediatric Neurology Association distance learning course (paediatric neurology course) ■ Dynamed ■ onexamination.com ■ E-learning Central Manchester NHS Foundation Trust
Sites not found – reported name too general	<ul style="list-style-type: none"> ■ Safeguarding children ■ Prescribing ■ Insulin prescribing via NHS e-learning ■ Safe prescribing course ■ Vaccines ■ Vitamin D ■ Palliative care ■ Register of skills training and achievement online training packages ■ Newborn examination ■ Local safeguarding boards child protection awareness e-learning ■ Meningococcal ■ E-module medical teaching ■ Female genital mutilation ■ Leadership ■ Echo teaching ■ Child protection recognition and rapid response ■ Critical appraisal course ■ Breastfeeding training ■ Paediatric prescribing ■ Paediatric Care Online ■ Diabetes and rare medical conditions
Sites deleted	<ul style="list-style-type: none"> ■ European Society for Paediatric Infectious Diseases online antimicrobial management course ■ Core skills (5) Health Education England (NW)

Appendix 3a. Results and commentary from quality assessment proforma

	Yes	No	Partially	
Is the content attributed?	12	6		Author identified. Team identified
Are the qualifications of the website content authors listed?	5	5	8	Could find out details if institution stated
Is content peer reviewed?	2	12	4	Often not stated or stated that 'quality reviewed'
Are appropriate citations made to outside sources?	5	3	10	
Is there a clear distinction between editorial content and referenced material?	2	16		Majority of statements unreferenced
Is there a 'last updated' indication so you can decide how relevant the information is today?	14	3	1	Partially not clearly stated
Is author contact information provided to help clarify any questions that arise?	4	5	9	Could look up contact details in institutions' directories
Is there any third-party advertising on the site? (This might indicate a potential bias)	5	13		Usually pharmaceutical companies
Are all external funding source(s) disclosed?	6	12		Some had no statement of funding source at all
Are any limitations of the information stated?	4	14		Often not comprehensive coverage of subject but no explicit statement of limitations
Are links to additional resources provided?	15	3		

Appendix 3b. Results and commentary from quality assessment proforma

Question	Median	Range	Score indicators
Is it patient-centred and service-driven – focussing on equipping the workforce with the necessary skills for safe and effective patient care?	7	5–7	1: No reference at all to relevance of site content to patients or the needs of the service 7: Wherever possible the site makes reference to the relevance of its content to patients and needs of service
Is it educationally coherent – addressing clearly articulated learning needs that are aligned to service needs?	7	1–7	1: No linkage at all between learning outcomes and service needs 7: Clear alignment of content with learning outcomes which reflect service needs
Is it innovative and evidence-based – informed by the best available evidence, and where possible be future-proof by being flexible and adaptive so minimizing redundancy?	5	2–6	1: No reference to best available evidence with no indication of gaps in knowledge and areas for future inquiry 7: All major statements supported by clear evidence source with clarity of the quality of the evidence allowing reader to understand where evidence is lacking
Does it deliver high quality educational outcomes – meets and wherever possible exceeds agreed standards?	7	5–7	1: Educational aims and outcomes either not stated or not addressed by site content 7: Educational aims and outcomes stated with site content and its delivery likely to achieve these
Does it deliver value for money – potentially improving productivity, reducing duplication and being affordable and cost effective?	7	7	1: Appears expensive or very time consuming or replicates other (more efficient) sources of information 7: Appears cheap and a unique source of the information as well as the site facilitating learning at an appropriate rate
Does it ensure equity of access and quality of provision to target audience?	7	6–7	1: Only potentially accessible to a limited number of relevant learner groups 7: All relevant learner groups can easily access