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JSP 822

Part 3: Chapter 5

Learning Technologies

Formerly known as Technology Based Training



MINISTRY OF DEFENCE

Training Education Skills and Resettlement Division

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INTRODUCTION

1. The Learning Technologies¹(LT) chapter of JSP 822 has been produced to define policy and also provide initial guidance for anyone involved in developing or implementing LT within Defence. More detailed information and further guidance is available in the Technology Based Training (TBT) Defence Training Support Manual (DTSM)².

2. Each section includes applicable policy direction and initial practical guidance on how compliance with the policy can be achieved. These are identified by the sub headings **policy** (with **rationale**) and **guidance** (for ease of reference policy has been highlighted in grey boxes). It is accepted that there may be reasons why compliance with policy in certain cases is not in the best interests for Defence, however this would need to be justified clearly.

BACKGROUND

3. Defence has been using LT for many years and examples of good practice have often been prevalent. This manual has been written in consultation with practitioners across Defence to share this good practice and provide a framework against which current and future LT developments can be assured.

TARGET AUDIENCE

4. The following groups of people are to follow the principles and framework within this publication:

- a. Training and Education Sponsors. E.g. MOD, CAP and DE&S.
- b. Project Teams who have Training and Education responsibilities. E.g. MTS, JBTSE and FsAST.
- c. Course Managers.
- d. Course/Instructional Designers.
- e. Trainers, Lecturers, Teachers and Instructors.
- f. Internal T&E Consultants.
- g. Partners, Contractors and Suppliers involved in Defence LT development and implementation.

IDENTIFYING THE REQUIREMENT FOR LT

5. Other Defence documents, principally JSP 822, describe policy and guidance for the whole DSAT framework including the identification of T&E requirements. Various types of LT media can be considered as possible solutions to T&E requirements ranging from innovative new T&E proposals to an incremental improvement to current methods. These

¹ Learning technologies is the broad scope of technologies (including hardware, software and communication networks) that can be used to support, manage and deliver learning (JSP 822 Glossary).

² The TBT DTSM is due to be replaced by the Learning Technologies Handbook by Jan 2012. Draft copies are available from DCTS LT R&D.

considerations could occur at various stages of the process, however most influence is likely to occur during the Training Resource Estimate or Training Options Analysis phase of DSAT.

6. The key to identifying the LT requirement is to first analyse the most appropriate delivery method (such as lecture, discussion, self study, etc.) and then analyse the most suitable media (which could be a classroom, a book or some form of LT).

a. **Policy.** For all LT requirements across Defence, an analysis of the most suitable methods and media is to be undertaken and documented before procurement is recommended.

b. **Rationale.** Not all LT are suitable for all training and education requirements. In order to select the most appropriate media (such as LT), an analysis of suitable methods is required first.

c. **Guidance.** The recommended Methods and Media Selection Tool (MMST)³ is a simple application which includes e-learning and reference material for this purpose and supports the Defence Training and Education Optimisation Strategy⁴. The MMST provides a simple and fast framework for ensuring that a basic level of analysis is completed before the development or procurement of new LT. The tool is flexible in that it can incorporate, with minimal delay, new underpinning criteria once consensus across Defence is reached. The MMST is best used as a support tool as part of a working group discussion. Ideally this group should include subject matter experts, training/education specialists, course designers and sponsors.

7. After the methods and media selection analysis has identified possible LT, further guidance may be required.

a. **Policy.** Before planning development and implementation of LT, contact is to be made with single Service (sS) Learning Technology Working Group representatives⁵ for advice or, for those Defence units without a sS lead, Learning Technologies at DCTS.

b. **Rationale.** To avoid duplication of effort and wasting resources, contact with single Service leads, will allow an oversight of current capabilities. The Learning Technologies Working Group is a forum through which sS leads can then share and capture knowledge across Defence.

c. **Guidance.** Units embarking on LT implementation projects should aim to engage with other units across Defence who are using similar LT. DCTS Learning Technologies coordinates a spreadsheet of ongoing LT projects across Defence, including contact details, which is available on the DCTS LT website. Units, through their sS reps, should aim to keep DCTS LT informed on a regular basis so that this resource can be kept up to date.

PRINCIPLES FOR DEVELOPMENT AND IMPLEMENTATION OF LT

³ MMST details are in the MMST User Manual.

⁴ The Defence Training and Education Optimisation Strategy is published as a DIN.

⁵ Single Service Learning Technology Representatives are: D Trg SO2 LT Pol or SO2 LT DD (Army), TBTU OC (RN), HQ 22 Gp SO2 LT (RAF), DLPO Def Ac (Civil Service).

8. These principles are to be followed when developing or procuring LT for Defence and are to be applied in the following order:

Reuse.

- a. **Policy.** Evidence must be clearly provided in business cases that research has been undertaken to establish whether existing relevant LT are already available to Defence.
- b. **Rationale.** At the time of publication there are over 1500 courses on the Defence Learning Portal (DLP) and there exists arrangements with coalition partners to share LT content (examples include Government off the Shelf products – GOTS). Fully accredited LTs have already been purchased for MOD use. These include the DLP and associated virtual learning environments as well as enterprise licenses for authoring tools and 3D simulations such as VBS2. Defence is also required to utilise Civil Service Learning products for generic learning requirements which are common across government.
- c. **Guidance.** Courses on the DLP and Civil Service Learning Portal can be browsed and searched. The LT Projects spreadsheet on the DCTS LT website will indicate LT currently being developed across Defence. In addition, early contact should be made with DCTS LT or sS LT leads for guidance on whether existing resources are suitable for your requirements.

Flexibility.

- a. **Policy.** New LT developments or procurements must clearly show a (documented) effort to meet wider Defence needs as well as sS or job specific requirements.
- b. **Rationale.** New LT needs to include enough flexibility in order to meet the widest possible requirements across Defence.
- c. **Guidance.** New requirements must consider how the LT can be repurposed for other Defence requirements, although it is appreciated that finance may limit this flexibility.

Availability.

- a. **Policy.** New LT solutions must aim to maximise the number of Defence personnel who can access the LT. The DLP is therefore the default delivery mechanism to support Defence-specific LT, unless local IT infrastructure is not capable of providing access.
- b. **Rationale.** Delivery via the DLP will enable both internet and intranet (DII) access at anytime. This will support more learners with more freedom to learn when they wish.
- c. **Guidance.** The DLP is able to deliver a variety of LT such as e-learning, forums and Wikis. It also hosts a number of Defence Virtual Learning Environments (VLE). However where it does not meet specific sS or Defence Unit requirements, options should be discussed with the DCTS DLP staff and the

appropriate sS representatives in order to ascertain effective alternative solutions. Improvements to local IT infrastructure, if inadequate, should be given high priority.

9. License Free LT Applications

a. **Policy.** If reuse is not possible, analysis of available license free LT must be evident when considering new LT requirements.

b. **Rationale.** Licence free software such as Open Source (code which can be changed without restrictions) and Freeware, offer the opportunity for cost effective LT with no ongoing license fees (some Freeware is only available for personal use).

c. **Guidance.** Defence already has Open Source and Freeware LT applications, such as Moodle⁶, which has no annual license fees and is now fully accredited for use on the DLP. Such applications however, will introduce risks due to lack of support and maintenance which may require a commercially managed service. In addition, there may be accreditation and security constraints which will restrict their deployment on MOD systems and introduce significantly increased costs. Further information will be available in JSP 440.

10. COTS.

a. **Policy.** Once research of existing or GOTS resources has been exhausted, Commercial off the Shelf (COTS) LT solutions are to be considered, on a case by case basis, before in-house or bespoke development.⁷

b. **Rationale.** COTS packages are normally robust, well supported and cost effective therefore implying low risk for implementation. They will also be available immediately within commercial and accreditation time constraints.

c. **Guidance.** The MOD has several independent software preferred suppliers, such as Softbox, who can assist with the procurement of COTS packages.

11. In-house Development.

a. **Policy.** If a bespoke development is required (i.e. existing, GOTS or cost effective COTS solutions are not available) then the default development method, is to be in-house (assuming local resources are available).

b. **Rationale.** Many simple and rapid LT authoring tools are now available which do not require programming skills. This supports the development of content by SMEs eliminating much of the communication, time and cost overheads associated with employing commercial developers.

c. **Guidance.** Maximum use should be made of local graphics studios who are also improving relevant expertise. There is a growing network of content developers across Defence as well as centralised training and support at DCTS Learning Technologies (who also manage enterprise licenses for authoring tools). Systems

⁶ Moodle is an open source (online) Course Management System (www.moodle.org)

⁷ Value for money through COTS purchase should be compared with the costs and risks of employing in-house or bespoke development.

should be set up to control and assure the quality of in-house development. It should also be recognised that developing in-house capability will require an increased resource and training commitment.

12. **Commercial Development.**

- a. **Policy.** Commercial development of LT must only be procured for those specific elements which cannot be cost effectively developed in-house and are not already available within Defence (or via cost effective GOTS/COTS products).
- b. **Rationale.** Although far more development tools and expertise are now available in Defence, there will be exceptional circumstances when the requirements justify external development. These could include high fidelity LT requirements using state of the art development techniques and technologies or the non-availability of in-house developers.
- c. **Guidance.** Enabling agreements exist for the procurement of bespoke LT⁸. If new technologies or techniques are being used, any contracts should aim to include transferring this knowledge to in-house experts.

LT CONSTRAINTS

13. **Security Accreditation.**

- a. **Policy.** Appropriate Defence security accreditation agencies must be engaged **before** any planning or development work for unaccredited LT has been started.
- b. **Rationale.** Accreditation is a challenge with firm regulations which are not apparent to many LT project members. Gaining Defence accreditation must be sought immediately after it has been identified that a new LT will meet the requirement.
- c. **Guidance.** For local implementations of LT, the unit CIS security rep can provide advice on how to proceed. For web-based solutions which are distributed across Defence however, a DSAS⁹ accreditor will need to be appointed. In addition, with DII, if there is a requirement to load software on PCs, a long process of compliance testing and evaluation will be required.

14. **Technology Limitations.**

- a. **Policy.** New LT projects are to include relevant analysis of technology limitations which will constrain development and procurement options.
- b. **Rationale.** Many previous Defence LT projects have not achieved expected outcomes due to a lack of experience with regards to technology limitations. Defence has over 1000 different networks with many legacy systems and locked down applications. Bandwidth and processing limitations are compounded by security software.

⁸ See Bespoke Procurement section for more detail.

⁹ Defence Security and Accreditation Service (DSAS): contact details on Defence Intranet Team Site.

c. **Guidance.** Plan new LT within tried and tested infrastructure and software applications. Use compressed and standardised media which reduce bandwidth and processing overheads. Specific technical specifications are available on the DLP. Contact DCTS LT for further advice.

15. **Culture**

a. **Policy.** New LT development and implementation planning must include management of the cultural change aspects inherent with any new LT.

b. **Rationale.** Although new technologies have been deployed in Defence for some time, many have not been used successfully or just completely ignored. Unless, the chain of command supports and influences widespread deployment, many implementations will just become obsolete. Cultural attitudes are a major factor towards whether there will be a successful implementation of LT.

c. **Guidance.** Units should identify high ranking “champions” who will encourage usage. Appropriate selection of early adopters will enable word of mouth endorsement. Begin with any incremental adoption of LT which offers the fastest and most obvious benefit to users and the unit.

IN-HOUSE DEVELOPMENT

16. As explained previously, in-house development of LT should be considered before bespoke procurement.

17. **Development Tools.**

a. **Policy.** In-house developers are to use development tools that have already been procured by Defence unless the local unit infrastructure is not capable of providing access.

b. **Rationale.** Economies of scale have been achieved by Defence purchasing LT tools such as CourseBuilder© for e-learning, Moodle for virtual learning environments and Virtual BattleSpace 2 (VBS2©) for simulation. Moreover, these LT have been accredited by DSAS and meet commercial constraints and are therefore available for immediate use.

c. **Guidance.** Training is available for in-house development via the DLP and through residential training. Training and support can also be arranged on site by contacting DCTS LT. Procurement of new development tools would need clear justification (such as inadequate infrastructure connectivity to web-based authoring tools).

18. **Development Collaboration.**

a. **Policy.** LT development is to follow a flexible method which allows regular review between all stakeholders (such as managers, developers, sponsors, instructors, students etc).

b. **Rationale.** LT by their nature, depend highly on human interaction and are therefore often difficult and complex to define and design. A cyclic prototyping

method which ensures that SMEs and end users are fully involved in the development process will increase the likelihood of a successful project.

c. **Guidance.** For e-learning development, utilise a web-based collaborative capability which allows easy review by all stakeholders throughout the development process. This collaborative capability is included with the current DLP authoring tool (CourseBuilder©) however other authoring tools will require separate technologies such as shared areas and email to ensure that collaboration during the development is facilitated and maintained.

BESPOKE PROCUREMENT

19. The following policy and guidance applies when commercial companies are contracted to produce LT for Defence. These companies should also be made aware of the policy and guidance within this document and their development methods should be transparent and coherent with this publication.

20. Enabling Agreements

a. **Policy.** Government or Defence enabling agreements should be considered first for the procurement of LT. If existing agreements do not meet the requirement then the Acquisition Operating Framework (AOF)¹⁰ for new contracts is to be followed.

b. **Rationale.** Existing enabling agreements ensure that approved suppliers are used who satisfy government or Defence requirements. These agreements are managed and reviewed to ensure that value for money and quality are maintained.

c. **Guidance.** Procurement of bespoke e-learning can be through the MOD e-learning enabling agreement managed by the Defence Academy College of Management and Technology or through the pan-government enabling agreement: Buying Solutions which is managed by the Office of Government and Commerce (details on the internet). If no enabling agreement exists for the LT requirement, SoftBox is an example of an approved MOD supplier who can be used to ensure that MOD commercial and accreditation regulations are complied with. If the LT requires new contractual action, the AOF should be followed. Several months need to be allowed in the planning process for the production of a Statement of Requirement, Invitation to Tender (including advertising in European journals), Review of Bids and finally awarding the contract. Local commercial or budget personnel will be able to advise further.

21. Contract Specifications.

22. The following specifications should be documented in all LT contracts¹¹:

a. **Policy.**

¹⁰ AOF – Acquisition Operating Framework. Further details are available on the Defence Intranet

¹¹ No one in the MOD shall enter into a commercial contract unless they are commercially trained. The advice of a MOD commercial officer must be sought at the earliest opportunity, before entering into anything which could be construed as a contract.

- (1) The MOD is to have full Intellectual Property Rights (IPR) for all content produced by the suppliers including source files. Any exclusions (e.g. proprietary media players) must be explicitly stated.
- (2) Suppliers are to be constrained to use development tools which are fully compatible with the tools that the MOD have already purchased.
- (3) Content produced must be in a format which will enable maximum reuse and integration with existing Defence LT.
- (4) Suppliers are required to make clear their development process to the Defence customers. This will include design principles and techniques which can be learned and applied by in-house experts for future projects.
- (5) Deliverables must be in a format which will enable maximum capability for Defence to update and reuse the content without recourse to further contractor involvement.
- (6) Deliverables must be in a format which will enable the optimal distribution across Defence's infrastructure resulting in wide availability to the LT using the maximum variety of media.
- (7) Through life funding and support agreements are included if required.

b. **Rationale.** The content should aim to be flexible enough to enable maximised reuse and sharing with other Defence LTs.

c. **Guidance.** Single Service LT leads and DCTS LT have experience of managing contracts for LT and can therefore provide further detailed advice for bespoke development.

23. Guidance and advice on procurement of LT for the Maritime, Land and Air domains should also be sought from the following organisations within DE&S:

- a. Maritime Training Systems (MTS).
- b. Joint & Battlefield Trainers, Simulations & Synthetic Environments (JBTSSE).
- c. Flight Simulation and Synthetic Trainers (FsAST).

BENEFITS MANAGEMENT AND REALISATION

24. Benefits need to be identified and defined in advance. Clear planning is required to enable the easy identification of all benefits realised.

a. **Policy.** Business cases for LT must clearly list benefits and how successful achievement of these benefits will be measured after implementation. Assumptions and risks must also be included.

b. **Rationale.** Many MOD LT projects do not meet expectations. This is often due to the lack of clear benefits and methods for measuring them (metrics) agreed by all stakeholders.

c. **Guidance.** The Learning Technologies Checklist includes a list of possible benefits and metrics which can be considered for new LT implementations. The following are examples of possible benefits:

- (1) Improved performance.
- (2) Reduced cost.
- (3) Reduced time.
- (4) More choices for learners.
- (5) Increased availability to learning.

SUMMARY

25. Incentivising success for LT is necessary to provide a more cost effective manner of delivering some aspects of training and it should be considered as an integral part of all course development programmes. Introduction to LT at initial training and during career development episodes is essential to create the right culture in all Defence staff, from new recruits to senior line managers. It will also be necessary to train instructors in maximising the effectiveness of LT; develop the skills required of on-line tutors; and ensure training managers are trained to utilise new technologies to their best advantage¹².

26. Recognition by the chain of command/line manager for “learning” as a fully supported workplace activity is fundamental to success. Therefore, creating the right environment for learning to take place, at work or elsewhere, must also be presented as part of the cultural message.

27. People, culture and effective business change issues associated with the broader adoption of LT will naturally be greatly and constantly influenced by an increasing exposure to high quality technologies and courseware and ever easier access.

28. Intelligent development, procurement and introduction of LT supports the maximum reuse of learning material and capabilities. If these processes occur in isolation, the full potential for exploitation by Defence of LT will never be maximised. Only by exposing and sharing their development with all areas of Defence will maximise cost effectiveness and repurposing be realised. The DLP will continue to play a central role in Defence-wide exploitation of e-learning and other distributed learning technologies.

CONTACTS

29. For further information and contacts visit the DCTS Learning Technologies website on the Defence intranet.

¹² DCTS provide various training courses for this purpose, some of which are “blended” using LT or have been adapted to include modules on LT.