A Future Vision for the Defence Learning Ecosystem

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ABSTRACT

The UK Ministry of Defence (MoD) recognizes that operational doctrine is changing in response to the emerging realities of international and domestic Defence requirements. This has profound consequences for any learning system. The MoD is also discovering that the benefits posed from delivering new learning themes, that focus on the optimisation of human factors, are difficult to quantify using traditional metrics. The challenge is to deliver the most cost-effective and human-centered approaches to what can often be a diverse and changing set of requirements.

This research initially explored relevant education and training literature. Eight interviews and a stakeholder workshop were conducted with key training and learning specialists and current students in UK Front Line Commands (FLCs) (Joint/MoD Head Office, Royal Air Force (RAF), Royal Navy (RN), and the British Army) to analyse the current Defence Learning Ecosystem and understand change requirements. Findings indicated that learning analysis, design and assurance must become more agile and braver in future, to deliver maximum impact and increased value. The following key themes were raised: data, scope, barriers, optimisation, and motivation.

Research showed that the hierarchical nature of the current Defence organisation acts as a blocker to innovative instructional approaches within the current Learning Ecosystem. Changes are needed to improve the current Defence Learning Ecosystem into a coherent and adaptable process. Recommendations for UK Defence highlight focus on 'Primary Concept Realignments' which outline a dynamic and intuitive interaction between seven core anchors (people, culture, strategy, content, technology, governance and communication). Following implications include benefits for learning strategy development and governance in UK MoD future training. This will be developed further to describe a phased roadmap for optimising resources and managing change, framed around the core anchors and their connective tissue.

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RECOGNISING KEY INFLUENCERS OF CHANGE

The Defence Learning Ecosystem is constantly evolving to keep up with flexible requirements and understanding of best practice. The Ecosystem components of people, technology and learning cultures interact continuously in new ways to experience learning opportunities. Key drivers into the effectiveness of the current UK Defence Learning Ecosystem include investment, infrastructure, technology, course design, and training delivery (Cullingford et al., 2019). Cullingford et al. recommended that in order to improve the development of new learning incentives there is a need to update policy, the standardisation of training content formats, the development of on-demand access to training content, the style of training being delivered, and the sharing of knowledge and resources across the elements of the Defence Learning Ecosystem. To meet these changing requirements, training and learning specialists in large organizations are applying modernized learning methods to the changing educational remit. These methods include blended learning; narrative learning; soft and life skills training; and game-based learning. The changing educational remit and its modernized learning methods will now be addressed in turn.

The Changing Educational Remit

Education is moving from being addressed as simply a means and act of acquiring a skill or competence, towards something comprehensive and emotionally beneficial. Education change is driven by a need for student control over learning, and innovative and holistic pedagogy (Schulte et al., 2019). Predictions for the future of learning typically agree on certain elements of learning. Castaño Muñoz et al. (2013) predicted that personalisation, collaboration and informal learning will be at the core of future learning, emphasising the importance of recognising informally acquired skills. Currently, training design has a tendency to focus on presenting material and conveying information from trainers to learners. Moving forward, future incentives implementing a student-centric focus are key (Scavarelli et al., 2020). In order to develop a well-rounded workforce, it is important that learners construct and build their own new knowledge based on experiences, contextual learning and technological advancements. Paile et al. (2018) analysed typical training exercises and interviewed military academics, training policy writers, Officers and seniors. They demonstrated how current military education embodies a classic modernist view on education that is rooted in universalism, uniformity, structure and objectivity. Traditionally, military training concentrates on physical skills. This is a limiting factor, as a lack of focus on soft skill development can result in lower all-round training effectiveness.

Longitudinal research into UK Defence Army Officer training found that current Defence training initiatives built on traditional taught elements alone are inadequate and there is a real need for alternative approaches that better support further learning in complex, dynamic, project-centric environments (Egginton, 2000). Although the collaborative team approach used in traditional Defence training initiatives constituted the most significant predictor of project performance, Egginton advised only when due consideration is made of other types of learning will a genuine competence be met. The idea is that introducing new learning techniques will help prepare soldiers to foster resilience against unpredictable events and positively impact their ability to deal with cognitive pressure (Sookernany, 2017). The current paper examines the extent to which pedagogical strategies may enable key learning trends to provide an engaging Learning Ecosystem for military soldiers:

- Constructivism (informal learning where people create their own understanding through experience and reflection)
- Contextualism (putting concepts in context to learn and retain better)
- Blended delivery (including both online and offline delivery with personalized student control over time, place, path or pace)
- Gamification (educating using game design methodology)
- Embedding lessons in narratives through transmedia storytelling (personalizing storytelling)
- Collaborative learning (multiple perspectives, celebrating differences)

These strategies were chosen based on how effectively they are predicted to influence individual and organisational learning environments. Implementing modernized learning strategies into a traditional system does not come without challenges. Military education centres on fostering a sense of shared identity, which is structured and preserved to keep every part of the organisation in line and on course (Sookermany, 2017). Liberating military education from outdated aspects of traditional belief systems that have governed their educational programs should be a focus in any incentives moving forward (Hagen, 2019).

Whilst there are areas of significant innovation in opening up the educational remit within Defence, generally the exploration is timid and lacks a deep recognition of the relationship between techniques, process and the underpinning behavioural human factors. This could be achieved by looking at the spaces between the core anchors: people, culture, strategy, content, technology, governance and communication, rather than just focusing single-mindedly on each anchor. With this in mind, this paper also addresses the nature of change in large organisations. Exploring the spaces between the anchors will encourage conversion of the energy being created by sporadic outbursts of innovation and allow ideas to bloom in clearly defined centres of specialism that could be managed as an internal market for those seeking innovation. The idea of a medium-term detailed transformation programme with a built-in exit strategy and a mandate to 'earn' its way through the MoD's current Defence Learning Ecosystem will help eradicate many issues with duplication related to organisational change. Currently, important insights are being duplicated and are not always being followed up with appropriate resources. More comprehensive coordination across the whole Defence community is needed.

Blended Learning

Despite disagreement on an exact definition, many institutions are adapting blended learning to respond to the specification needs of their target audience (Moskal et al., 2013). Particularly because this is a technique that works well towards retaining knowledge (Lothridge et al., 2013), blended learning approaches are becoming common across global militaries. The e-learning environment can be self-sustaining, providing learners with the tools and surroundings they need to achieve their individual learning objectives (Pappas, 2015).

Personalisation of learning is a process rather than a product or state (Deighton, 2019). It is a driver of training efficiency, operational effectiveness, learning achievement, engagement, and a positive learning culture. Deighton developed a four-component model of a learning environment (learner, teacher, technology and environment). By considering the interactions of these components in adopting personalized learning measures of effect, utilising a mix of methods and media tools for training delivery and designing a structured learning pipeline, the MoD might be able to exploit the benefits of personalized learning.

Well-designed Learning Ecosystems also include support for student learning transfer, accommodating for individual traits and organisational characteristics, efficient training design, content and an intrinsic learning focus (Cullingford et al., 2019). Investigation into student emotional engagement in training and education shows that blended learning course design and student perception variables had a greater influence on engagement than individual student characteristics (Manwaring et al., 2017). As such, it is imperative that any future Defence Learning Ecosystem seeks to address a combination of these positive Ecosystem traits.

Use of Narrative

Another learning modernization is transmedia storytelling. Transmedia storytelling is the system of messages that reveal a narrative or engender an experience through multiple media platforms and aims to emotionally connect learners by involving them personally in the story (Raybourn, 2017). It helps provide meaning by giving learners the context to contrast, relate to and interpret their own lessons from the story. Transmedia learning is used globally in large organisations across different sectors, notably in both health care (Marini, 2019) and large corporate organisations. U.S Defence has also applied narratives within U.S Marine Corps learning content, receiving positive responses. Krulak (1999) provided a fictitious narrative of the 'Strategic Corporal' written as an operational report published in the Marine Corps Gazette. The guidance is free from objective, instrumental and technical step-by-step instructions and policy. Rather, it is written in a narrative, personal and contextual manner that recognizes the complexity of the task and calls for the individual soldiers' emotional involvement in the mission (Sookermany, 2017). The work portrays the vision and mission but leaves the responsibility and specifics of the task solving to those who are to do the work. Transmedia has recently been presented to the UK Defence as a new paradigm for more effective and scalable training and education, including reference to the success of it's use within the U.S Army. UK Defence should consider this advice seriously when updating or developing training and learning initiatives (Raybourn 2014).

The UK military is beginning to use narrative film scenarios in training manuals such as the Military Annual Training Test (MATT) to aid decision making for Rules of Engagement training (Cullingford et al., 2019). When applying this narrative process to game-based Defence training exercises, Raybourn's (2007) simulation experience design framework implies that the strength of these exercises relies on the dynamic interaction, scenario narrative, game level context, and the feedback emergent culture cycle. The learning goals of many international organisations are consistent with transmedia objectives. In Defence, using a narrative format across different types of media delivery can be seen in the Army Learning Model. The use of transmedia methodology goes hand in hand with the shift change in individuals using online media communications and the different forms of participatory culture. Transmedia communication encourages user innovation and information sharing, because knowledge resources are often organized around a common set of problems that people work through collaboratively (Herrero, 2019).

Soft Skills

Global Defence education is changing from mainly focusing on technical skill development alone, to including soft skills and life skills training (Hosseini-Shokouh et al., 2018; Kirchner & O'Connor, 2018). This is important because shifting the educational focus away from developing solely traditional technical skills can encourage a more capable and therefore a more resilient soldier. For instance, a U.S research study, examined the risks of combat exposure on subsequent psychological health for soldiers who either did or did not receive soft skill battlemind training[1] before deployment (Mulligan et al., 2012). Outcomes showed that by having a focus on self-confidence, creating a 'safe-to-fail' environment prior to deployment, and encouraging mental toughness radically decreased the likelihood of post deployment mental health difficulties. There is currently minimal focus on these elements of training in UK Defence, but an emphatic focus on the educational delivery of soft skills[2] would be beneficial in protecting soldiers during deployment. This should encourage UK Defence to place importance on emotional skill sets when developing new training and learning incentives. Developing a more resilient workforce has the potential to positively impact operational activities (Hagen, 2019; Sookermany, 2017). This is evidenced through recent military transformation of Western democracies, where a shift change in education has brought about smaller, more flexible forces as opposed to large, static Defence forces. This change has helped deliver operational capability where and when the need arises, with capabilities to suit the regularly changing situation.

Gamification

Gamification can exploit people's enjoyment of playing games to convey meaningful messages or to enable intrinsic engagement with external stakeholders when developing radical solutions (Stock et al., 2015). Building a psychological focus into gamification can motivate the choices people make without external influence and interference, otherwise known as accidental compliance in an educational context (Reeve, 2002). This emotional engagement can improve learning efficiency and help learners to explore novel aspects of innovative activities (Stock et al., 2015). Shi et al. (2017) established frameworks that integrated emotional gamification mechanics with the adoption of advanced services. This developed six conceptual propositions that explore how gamification can facilitate behaviour change. Their findings have implications for potential Defence exploitation through applying emotional mechanics of gamification.

Currently, gamification in Defence learning is usually pushed into practical demonstration or product development by the enthusiasm of a single talented individual in a local unit, rather than a confident policy commitment. The usage is highly focused on a specific localized learning outcome and is rarely designed to accommodate other kinds of learning that could be applied elsewhere. Perception of what gaming is can be over-influenced by current marketplace product styles, not necessarily instilling the broader benefits that can be derived from the underlying concept of learning through multichoice scenarios in a competitive environment.

Combination of Approaches

It has become clear that Defence learning is changing from using predominantly traditional classroom-based teaching approaches, to holistic, collaborative and innovative methods. These learning strategies could be harnessed in a

1 Battlemind is a combat zone deployment training programme that encourages the Soldier's inner strength to face fear and adversity with courage. Key components include increasing self-confidence by taking calculated risks and handling challenges.

2 Soft skills are a combination of people skills, social skills, communication skills, character or personality traits, attitudes, career attributes, social intelligence, mental agility and emotional intelligence quotients.

Defence context to aid in the learning journey of all military staff, including the use of constructive learning, contextual learning, blended learning, transmedia learning, gamification and collaborative learning.

Implementing a well-designed student centric course as part of an approach that combines individual differences with intrinsic learning is logical (Cullingford et al., 2019). It involves providing opportunities of self-creation for military learners by providing an arena for dialogue, narratives and metaphors, to cultivate individuals whose judgement is developed and matured in a way that makes them culturally astute, agile and well-informed (Sookermany, 2017). A combination approach ensures a focus on soft skills and helps develop resilience and emotional engagement in military staff. Emotional engagement is a powerful learning tool and by using delivery methods such as gamification and narrative storytelling, Defence can encourage intrinsic engagement with staff. An assessment of this literature indicates that it is important that any future Defence Learning Ecosystem seeks to address a combination of these positive Ecosystem traits. There are many novel forms of learning that could have benefit to Defence, but there is a lack of research tying what is already being done in the Defence world with how these novel learning techniques could be used in the future. Much of the existing research focuses on current problems with training and education, but does not link this work to a future, tangible vision for Defence.

Research Method

To explore and apply learning research to a Defence audience, the current research began with eight stakeholder interviews. The interviewees included UK Defence learning and training specialists and current trainees across the tri-Services. Purposive sampling was used to locate a mix of participants of both senior trainers, learning specialists and current trainees with recommendations from Dstl. Qualitative telephone interviews were chosen alongside a general interview guide approach to ensure that target areas were covered, whilst maintaining some participant freedom to discuss the differences across the Services. The interviews aimed to understand the central themes of the Defence Learning Ecosystem across all three Services. One month after the interviews were conducted, the research team hosted a workshop for ten senior training and learning Defence specialists. The feedback from this workshop has been analysed and integrated into refining the research vision and recommendations.

The interviews assisted in the evaluation of the current Learning Ecosystem and helped to effectively analyse the drivers for change across Defence. The aim of the stakeholder workshop was to ground the interview insights and validate the existing situation across Defence training and education. The method will be discussed first, followed by the presentation of findings.

Interview Method

At the start of each interview, the researcher explained the purpose of the interview, the terms of confidentiality, the interview format, the length of time (one hour), the opportunity to ask questions and they informed the interviewee of the data capture software being used to record the interview (Otter AI Transcription). The interview data was analysed thematically using Braun and Clarke's (2006) reflexive coding methodology.

Workshop Method

One month after the interviews, a total of ten senior Defence stakeholders attended a facilitated one-day exploratory workshop. These were a combination of six of the stakeholders that were interviewed, as well as four new stakeholders. A combination approach to recruitment was considered the best option to provide fresh insight from training and learning Defence specialists that were new to the project, whilst giving the interviewed stakeholders the ability to expand upon their thoughts. The aim of this workshop was to analyse the information gathered on the current Ecosystem, and to present the 'bare bones' of a vision for stakeholders to evaluate. Three facilitators and two scribes recorded key information and insights from the stakeholders. The iterative nature of the project outputs improved throughout the process as insights were gathered and applied.

The workshop focused on three areas of debate, including; (1) exploring with stakeholders the opportunities for change that protect current best practice; (2) using new understanding of the psychology of learning to modernize, and; (3) how this value could be transferred across a broader MoD landscape. The objectives for this workshop were:

- To gather information that contributes towards a vision that is disruptive, but grounded in tangible evidence from stakeholders, previous research and relevant global literature; and,
- To steer the direction of the current vision iteration, and; to inspire new thinking related to Defence training and learning.

The structure of the workshop was split into two halves with three main exercises. Exercise One concentrated on information gathering and exchange. Exercises 2 and 3 focused on developing pathways from the current learning system to a new future Ecosystem. This structure enabled all the necessary stakeholder information and experience to be gathered first, followed by an exchange of knowledge.

Exercise One: Imagine If. It was important for stakeholders to understand the project team's approach to the new vision, delivered through an immersive video. This video delivery method went beyond the traditional PowerPoint methodology commonly used at workshops, and instead engaged with the imagination and ambition of stakeholders by showing an emotionally engaging snippet of a potential future. The facilitator led a discussion following the video, in which stakeholders commented and debated elements of the video. During this knowledge exchange, notes were taken to record the outputs.

Exercise Two: Rich Picture of the Current Learning Ecosystem. Following sessions were geared around the stakeholder input on the steps that need to be taken to get from the current system to a future iteration. This involved stakeholders working together in groups, drawing on their valuable background and experience in training roles to contribute towards pathway development. The aim was to see where the team's understanding of the current system was correct and if there were important omissions from the Rich Picture diagram.

Exercise Three: Syndicate. The syndicate exercise involved splitting the stakeholders into three groups, with each group being given the mission of developing a plan to move from the current system, as described in the Rich Picture, towards the ideal future system as identified through the 'Imagine If' exercise. This planning exercise was primarily aimed at encouraging the syndicates to discuss priorities for change and potential barriers rather than setting out detailed chronological or step-by-step plans.

Interview Findings

The interviews were transcribed and coded in order to identify main themes. The interviews identified five main themes related to the current Defence Learning Ecosystem: scope, barriers, motivation, optimisation and data. The main theme of **scope** reflected the challenge of giving a good definition to a future Defence Learning Ecosystem and emphasized the sharing of good practice and the need for a proper requirement to be defined. Stakeholders discussed the **barriers** to implementing a successful Learning Ecosystem in detail. During the interviews, culture, preconceptions of online learning, lack of understanding capabilities, and learners' fear of failing were all regularly discussed as barriers to both change and successful implementation. The pedagogy[3] of learning and training in the military was observed to have several characteristics both in terms of current practice and ideal future practice. Stakeholders consistently commented on the difference between education and training across Defence, specifically that there is a difference between training to acquire a specific skill and a more rounded approach to learning that is characterized by education. Stakeholders generally felt that training[4] was done relatively well. They provided reasoning that hard skills, such as learning how to fire a gun, are extremely dangerous if trained badly. Stakeholders commented that the military did not cover soft skills education[5] including social emotional skills, critical thinking and emotional intelligence anywhere near as thoroughly, if at all.

The **motivation** of individuals within the current Defence Learning Ecosystem was a recurrent main theme throughout. Motivating factors for education and training included promotion, competition, fear of failing, and that it is a mandated activity. Stakeholders noted these as risky behaviours. A number of suggestions were put forward under the main theme of **optimisation** for how the Learning Ecosystem can be improved. For example, stakeholders commented that there is a lot of evidence of good practice but that the evidence is rarely communicated across Services and different jobs. Stakeholders noted that blended learning and multimedia learning should be a focus point going forward. The final main theme identified was **data**, which was often framed in terms of how it could address and support the other main themes. Data analytics was discussed as something that should be used to improve education and training, alongside data retention, data sharing and data access.

3 Pedagogy: is most commonly understood as the approach to teaching, refers to the theory and practice of learning, and how this process influences, and is influenced by, the social, political and psychological development of learners.
4 Training was defined using examples like phase one training, physically learning a skill on a course, physical training of a piece of kit.
5 Education was referred to using examples such as: personal development courses, career progression, non-essential learning, degrees and long-term retention of skills.

Barriers to Change

Barriers to change were consistently discussed by all interviewees and as a result were required to be broken down into more digestible sections to analyse. Data related specifically to six identified change barriers within the current Defence Learning Ecosystem, notably: time, culture, understanding capabilities, complexity, third party involvement and providing individuals with ownership over learning.

Time was noted by most participants as a challenge, with learning and education discussed as often being an activity which must be fitted around other duties. This was closely linked to the logistics and the practical barriers that limit the implementation of learning activities, although it was also noted that some of these challenges could be overcome by engaging with practitioners and trainers during the design phase. The **cultural** barrier related to attitudes and perceptions of education, training and learning within the military, and the importance that is placed upon these.

Specifically related to online learning, participants regularly mentioned the idea of preconceptions, with a view that online learning tools may be seen as a 'cheap alternative' to offline learning. This relates to the view that people may choose the path of least resistance when engaging with learning and training activities through, for example, finding ways to bypass activities so that the required score is met, or a box is ticked without the intended learning fully taking place. Similarly, taking part in learning or training activities was seen by stakeholders to be a source of possible delay to career progression and promotion. In relation to the educators and trainers it was noted that there could be a lack of **understanding capabilities**, in which educators and trainers create high quality content but lack the knowledge of the learning and teaching systems available to make full use of them. There were also a wide range of small anecdotal preconceptions that included: the assumption that manufacturers who build the tools also know how to train someone to use them; that knowledge owners somehow have the natural ability to teach their knowledge online in a way that can be retained; and that experts have to be 'live' in a room before their value can be harnessed.

The overall **complexity** of the organisation was noted as a barrier to learning and teaching, which several participants linked to third-party involvement. This was linked to what was seen as a focus on tools, often sourced from a **third-party**, where a new tool would be considered as a solution to the above challenges rather than something that facilitates the implementation of more fundamental solutions. In relation to individuals it was observed that the culture in the military may create a fear of failing, which may make **individuals** reluctant to ask questions in learning and training situations. Some individuals, particularly within the Army, were noted to have little prior experience of successfully obtaining academic qualifications. In these cases, the military was seen to be highly effective at developing the skill set of such individuals through training, although they were seen to be less effective at delivering higher level education.

Workshop Outcomes

The workshop outcomes build on the lessons learnt from the interviews, particularly related to the constraints and opportunities presented by the current Ecosystem. To summarize, the constraints highlighted by stakeholders included:

- A lack of high-level ownership of initiatives.
- A lack of available funds and proving investment benefits.
- The link between strategy and governance is not clearly made due to a lack of a high-level, Defence learning strategy, despite this being one of the most important elements in giving direction to the changes that needed to be made.
- There is a reliance on lengthy procedures. The difficulty of clearly stating specifications for a Learning Ecosystem was raised, with the open, flexible, continually evolving and content-driven nature of these systems being at odds with a government procurement system that relies upon lengthy procedures to procure systems based upon exhaustive lists of requirements.
- The focus is on passing exams rather than developing skills and knowledge.
- A skills-based approach is often taken instead of a competency-based approach.
- Data gathering, measurement, and monitoring must be improved.
- A lifelong learning journey culture must be developed.
- The interchange of reservists and regulars in Defence training and learning is not currently accounted for. Greater flexibility will be needed in any new system despite the fact that this may cause discomfort for those who have grown up using the traditional training and learning methods.

More positively, the stakeholders identified the following opportunities that Defence should consider when moving forward and taking steps to implement a new Learning Ecosystem:

- That there is potential to bring a new Learning Ecosystem to life by utilising more engaging, collaborative content. This is also predicted to help to engage the Millennial and Generation Z age ranges, which make up a large proportion of the current and potential near-term recruits.
- As there is a current lack of a clear definition of what success looks like in training and learning within Defence, there is an opportunity to clearly define a new set of parameters.
- There is importance placed on developing a culture that values learning and education development rather than 'tick-box' training. Stakeholders believe that many are already keen to facilitate this kind of change at a training delivery level.

Notably, the Joint Service Publication (JSP) 822 is both a constraint and an opportunity. Part of what constrains JSP 822 is that it is a defined process that must be followed in order to design, deliver and assess training courses but, as a system-based approach, it provides a flexible route from training and learning requirements through to decisions about course structure, media and content. Changes to JSP 822 or a supplementary document showing how to apply DSAT (Defence Systems Approach to Training) methodology to a future Defence Learning Ecosystem could be an effective way of communicating new approaches throughout the MoD's training and learning community.

DEVELOPMENT OF A FUTURE DEFENCE LEARNING ECOSYSTEM VISION

Vision Anchors

Stakeholders' opinions, experiences, and noted strengths and weaknesses from both the interviews and the workshops are reflected in the development of the vision and help form the existing evidence base for analysing the current Learning Ecosystem within Defence. The research developed a vision that could be subjected to interrogation. What follows is a statement of that 'straw-man proposal' and the subsequent methods that interrogated the likelihood of turning that vision into a strategic roadmap of interventions.

The interview analysis stated that there was significant visionary work currently being undertaken but that it was often lost in the sheer bulk of traditional delivery mechanisms, tired habitual routines and poor knowledge exchange systems. The future lay not in 'starting again' with a new blueprint, but in carrying out what the research team called 'Primary Concept Realignments'. These use new lenses to analyse, move resources to accelerate innovation, and deploy change management techniques in such a way that strengthens and scales out the partially hidden future already at work. The project team built upon current existing learning architecture and identified new areas of focus, referred to as 'core anchors'. The recommended core anchors of the Defence Learning Ecosystem were identified in previous research (Cullingford et al., 2019) as: people, culture, strategy, content, technology. Based on the interviews and the workshop data it became clear that two main areas were missing: **governance** and **communication**, and they should be considered as additional anchors. These important core anchors are not unusual in any large organisation. However, both the innovation hot spots and the system failures usually took place in the spaces between the core anchors. Research into current MoD incentives noted that there has been 'deep dive' analysis conducted into each anchor, but far less focus had been used on the connectivity or 'crossovers' between the core areas of activity. In each space between each core anchors, three main areas are evaluated:

1. A brief analysis of the evidence gathered so far related to the effectiveness of the crossover area;
2. A consideration of what kinds of intervention might help strengthen the crossover capabilities between these spaces; and
3. An identification of how these ideas could be deployed into a range of practical implementation building blocks that can be integrated into a more formal strategic plan.

Primary Concept Realignments

The project team used the early evidence from the interviews and the workshop to test the underpinning theoretical strategy by considering activity between anchors. The stakeholders who travel between these anchors can be generalized in market 'supply and demand' terms as learning tool suppliers and learning outcome buyers. The MoD's learning designers and their internal clients who order learning for their staff are clearly not always aligned in their knowledge of each other's needs. This means that part of the challenge is to upgrade the clarity of thought and the facilitation between them. In each anchor, the requirements of these two sets of critical stakeholders in the delivery of learning have been examined in some detail. However, it is not until how the stakeholders behave in the spaces

between is analysed, particularly in the facilitation pathways between people and content and technology, that it becomes clear that the dialogue and consequent actions become misunderstood, ill informed, repetitious, or just simply ignored. The research analysed the behaviours between the anchors which contributed towards an emerging solution that can be translated into a roadmap of change from which a stronger, more intuitive and broader Learning Ecosystem could evolve. Although the project team are a long way from refining the detail of such a roadmap, the initial research findings include the future Defence Learning Ecosystem realignments that lie between:

- **People, Governance and Communication**

Over time, the current system has adapted reactively to increasingly fast changes in provision need. This has often occurred at a localized level, with strategies and new learning packages that 'patch up' an issue or offer a quick solution to an emerging need. Whilst this work is exciting, the system suffers from not being able to refer to a central governing authority that is charged to see value across all the MoD, that is inclusive of all stakeholders. This can lead to resource duplication; knowledge sharing; and innovation 'timidity' where uncertain resources and authority can hamper action based on instinct and new insights. Realignment would be achieved by centralising and marketing a single communications network for all stakeholders to use; easy taxonomies to navigate; clear output deliverables; Service cross-over value narratives; encouragement to share knowledge and facilitation on storing ideas centrally.

- **People, Technology and Content**

This is a complex and wide-reaching area of crossover and two main areas of intervention are emerging. The first relates to data and the second considers how technology can be harnessed in a more fundamental way to make content more personalized and rewarding to use. Realignment of technology places more emphasis on developing three centralized data management functions that offer: on-demand content libraries; capacity growth analytics and real-time interventions using data to personalize learning. Realignment of content crossover can use technology to ensure that knowledge seekers, in a wide range of learner communities, can access the broadest range of knowledge owners using holistic tools and personalized learning pathways. This instills each learner with a sense of personal ownership of their own life-long learning.

- **People, Culture, Governance and Strategy**

The current Defence Learning Ecosystem teaching and learning structure comprises of a complex legacy of initiatives and not always coordinated localized solutions. There is evidence of 'silo' thinking, created 'just-in-time' to react to an issue, but given the pressure on the Service, then continue to be delivered without review. Realignments in these crossover spaces include protecting current best practice from poor implementation; establishing behaviour change as a sustainable and rewarding process; developing more inclusive and culturally sensitive content that moves from 'push training' to behavioural and knowledge exchange; and an upgraded data aggregation framework that enables the development of strategy and policy from evidence-based analytics.

Value for Money

In order for a new vision for a future Defence Learning Ecosystem to represent value for money for the MoD, it would need to demonstrate that the potential benefits offered by the Defence Learning Ecosystem more than offset any costs associated with implementation. The principles by which net economic value can be demonstrated are set out in the Treasury *Green Book* (Her Majesty's Treasury-HMT, 2018). The sources of potential benefit include a higher volume of learning; more effective learning; more efficient learning and cheaper learning. Specifically, the system described in the primary concept realignments could lead to an increase in the overall level of training delivery within Defence. The exploitation of new tools, technology and methods in the delivery of learning could make that learning more effective. It will increase the productiveness of individuals more than at present, will be more enduring in its effect, or a combination of the two. The better use of data to match individuals to learning opportunities, and to estimate the relative value of specific interventions for specific individuals, offers the potential to make learning more efficient in the sense that value-adding learning interventions are less likely to be missed, and that such interventions are likely to be higher-value ones. Simultaneously, the future vision offers the potential to avoid the costly delivery of learning to individuals where its potential value added is more than offset by the opportunity cost of its delivery. Even if the type, volume, and efficiency of learning delivery were unchanged, the vision could also offer more value by simply delivering existing learning at lower cost and exploiting better administrative technology.

Recommendations

Changes are needed to improve the current UK Defence Learning Ecosystem into a coherent and adaptable process, minimizing blockers to effective innovative instructional approaches. This will be driven by policy change, efficient

training standardization, data-driven program impact evaluation and a cultural shift that supports MoD-wide knowledge, resource and record management. Whilst there is currently a common governance approach to developing training in the UK Defence Learning Ecosystem called the Defence Systems Approach to Training (DSAT), each of the single Services[6] have different requirements that influence differences in the way that training is delivered. The existence of a single set of training principles in Joint Service Publication (JSP) 822[7] does allow a commonality of approach across the system. However, providing strict policy could naturally limit the ability of the system to rapidly incorporate new thinking and new ways of working as it must fit the JSP 822 structure.

Currently, the Defence Learning Ecosystem is a disjointed cluster of teaching and learning communities that does not seem to be progressing through any centralized authority. Tradition has been driving education up until this point and the MoD are dealing with the doctrinal demands of an uncertain future. Combine these factors with the efforts now consumed in valiant attempts to overcome joint coordination barriers and poor tri-Service communication and the evidence shows a high level of missed opportunities for knowledge sharing and an increasing duplication of resources. This research shows that the system needs to concentrate on larger collaborative innovation practice development that has the resources and even more critically, the confidence to think about change in disruptive and dynamic ways. The concept of moving from a process delivery system to a more holistic Learning Ecosystem requires a collective ambition for a much wider landscape change. Without this high-level intervention and advocacy, any future Ecosystem will not be able to generate the benefits of technology-enabled personalisation of learning, as learning innovation will be forced to proliferate locally as clusters of small, innovation groups that eventually will wither and the value is likely to be lost.

Key recommendations emerging from the output are that in order to gain 'accidental compliance' with Defence stakeholders, more innovative technology and content incentives must be used. There must be a structure to provide assurance of the design and delivery of learning that is much more holistic in the way it provides recommendations and training to course experts. Tri-Service coherence is absolutely necessary moving forward and is recommended by all stakeholders during both the interviews and the workshop. Facilitating a safe to fail environment for key soft skills and physical skills is recommended. Utilising the technology already present to form a more efficient data capture and analysis system will help create opportunities to deliver a successful personalized, lifelong learning approach.

The project team are now testing their initial theory, using the evidence to amend, discard or strengthen each cross over area. The team recommend that the next step should focus on developing iterations of a strategic roadmap that can be implemented in way that protects the current 'green shoots' and considerable best practice already being followed. Slowly realigning the systems and behaviors that encourage essential interactivity will help ensure that measurable value is still delivered, whilst remaining constantly flexible to face the emerging realities of Defence.

Consideration should be given to the idea of strengthening existing tri-Service coordination teams into a more heavily resourced but deliberately temporary "Transformation Facility" that has the mandate to inspire, coordinate and celebrate innovation across all of Defence. This might be combined with the recognition and strengthening of hubs of excellent learning practice that can be clustered to form an internal marketplace for know-how, scalability and exploitation. The centralization and fundamental upgrading of data capture and deeper capacity growth analytics could run in parallel with an increasingly powerful transmedia delivery platform. Above all, it is the extension of both specialized and generic learning themes and curriculums that takes priority in the development of a future-proof, robust Learning Ecosystem that remains the talent engine for the MoD.

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6 i.e. Army, Royal Navy, Royal Air Force

7 https://www.gov.uk/government/publications/jsp-822-governance-and-management-of-defence-individual-training-education-and-skills

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