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14. ABSTRACT This report describes current trends, best practices, uses, and potential options suitable for the use of Mobile Learning Technology (MLT) in Special Operations Forces (SOF) language training contexts. In this report, we define MLT has any type of smart device, such as a smartphone or tablet, which can be used to deliver learning content. While MLT has many advantages and potential applications, it should be not considered the "magic bullet" or solution to all barriers associated with SOF language training. In this report, we argue that MLT offers many significant and unique features which make it a powerful supplementary tool that can be integrated into both formal and informal learning environments. We ultimately conclude that while MLT can be used as a support, supplement, or tool to augment traditional learning, it is likely best used for SOF operator-driven informal learning and to provide performance support (prior to the task/mission) in an operational context. MLT provides SOF operators with the ability to integrate language learning into their careers and to become lifelong language learners.						
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Reviewing the Role of Mobile Learning Technology in Special Operations Forces Language Learning Contexts



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EXECUTIVE SUMMARY

“This Command (United States Special Operations Command [USSOCOM]) must provide warfighters sufficient language and culturally capable Special Operations Forces (SOF) to ensure successful and timely execution of SOF tasks and missions requiring such capabilities” (USSOCOM, 2009, p. 1). In an effort to develop SOF operators capable of meeting operational challenges in an era of persistent conflict and decreasing resources, the SOF community must develop a strategy for providing efficient and effective language training. One potential mechanism for accomplishing this goal is to use mobile learning technology (MLT). MLT refers to any type of smart device, such as a smartphone or tablet, which can be used to deliver learning content. MLT has the potential to add a dynamic flexibility to the training cycle for SOF operators and is currently a very popular proposed solution to many different training challenges. Supporters of the technology claim that MLT has the capability to deliver these training opportunities to SOF operators whenever and wherever they need them. In this report, we evaluate this claim to determine its veracity and determine applicability of MLT to SOF language training.

To evaluate whether MLT can be used in the context of SOF language training, this report describes current trends, best practices, uses, and potential options suitable for the use of MLT in SOF language training contexts. This report also investigates how and what MLT devices could be applied in multiple SOF language training contexts (specifically initial acquisition training [IAT], sustainment/enhancement training [SET], and pre-mission training [PMT]) to facilitate both formal and informal learning. Recommendations for SOF leadership on how to effectively and appropriately integrate MLT into current SOF language training are provided, along with practical, technical, device, and design considerations that should be taken into account when evaluating the incorporation of MLT into SOF language training. In addition to current SOF language training contexts, this report will discuss the use of MLT for performance support in an operational environment.

Conclusions

Conclusion 1: MLT has significant advantages, but is not a panacea.

Mobile learning has been defined as the “exploitation of ubiquitous handheld technologies, together with wireless and mobile phone networks to facilitate, support, and enhance and extend the reach of teaching and learning” (Brown, 2010, p. 28). While MLT has many unique advantages over traditional learning mechanisms, it also has some notable limiting features. The advantages and limiting features of MLT are shown in [Table 1](#) (p.3).

Some of the major advantages to MLT include the ability to download applications from the Internet and then use them anywhere, any time. MLT is also flexible and allows for individual customization based on the learner’s needs. Some of the limiting features of MLT are in relation to the type of technology available – small screen size, limited battery life, etc. However, these features depend on the type of device being used – a cell phone versus a tablet. Other limiting factors include Internet connectivity and availability; Internet access may not always be available. However, in many cases, applications can be used offline and then progress can be synced once reconnected to the Internet (e.g., Rosetta Stone®).

Table 1. Unique Advantages and Limiting Features of MLT

Unique Advantages*	Limiting Features
Connectability: connect to the Internet wirelessly via wireless fidelity (WiFi); many apps are downloadable.	Smaller screen size.
Portability/wearability: always at the fingertips of the user; one can access lessons, video clips and audio libraries from anywhere, including public places and moving buses and trains.	Smaller disk capacity and computer memory (RAM) allotment than that of a laptop or desktop.
Instant accessibility: instantly turn on and off.	Limited battery life between charges.
Flexibility: non-temporally dependent learning, as students can access the system anytime 24-7 and from any location.	Variability in connectivity; may not always be able to connect to the Internet, however some apps can be synced once reconnected.
Economic viability: have much of the computing capability and expandable storage capacity of laptops, at a fraction of the cost.	Small size of buttons/other interactive features.
Social interactivity: collaboration, active participation, co-creation of knowledge, and critical reflection.	User is more vulnerable to distraction or interruption while engaging in mobile learning than traditional learning (e.g., phone ringing or receiving text messages while reviewing vocabulary).
Context sensitivity: ability to gather data unique to the current circumstance (location, time, etc.), affords access to authentic contexts.	
Individuality: flexibility for each individual to follow a self-directed, personalized, custom learning path.	

*Adapted from Tucker, 2010

Conclusion 2: The potential role of MLT in language learning is largely influenced by (1) the type of learning (formal vs. informal) and (2) the purpose of the learning/moment of learning need. As the opportunity for informal learning increases, the potential role of MLT increases.

Learning can be broadly categorized into formal and informal learning. However, the terms “formal” and “informal” learning can be misleading in that they have less to do with the formality of the learning, but rather focus more on the process of the learning and who controls the learning. The distinction between formal and informal learning in the SOF language learning context is primarily focused on the learning process itself because the end goal for both formal and informal language training is driven by job requirements, language proficiency testing policy (e.g., reaching an Interagency Language Roundtable [ILR] level 1 in participatory speaking as measured by the Oral Proficiency Interview [OPI]), and promotion policy (e.g., new for Special Forces [SF]). Here formal learning can be characterized as command-driven, mandated learning that SOF operators are required to attend (e.g., IAT). The SOF operators themselves (the learners in this context) have little control over the learning process and goals.

However, in a formal learning context, some learners have other, personal goals for learning the language (outside of those set by the organization) that they set for themselves. In contrast, informal learning can be characterized as primarily SOF operator-driven, with each individual SOF operator having the ability to determine the learning process (e.g., unassigned personal study time) and choose the types of learning materials, whether they are provided by the organization or by the individual SOF operator.

In addition to the level of formality, learning can also be categorized according to the purpose of the learning. Malamed (2013) discussed Mosher and Gottfredson's (2010) Five Moments of Learning Need and suggested possible corresponding instructional approaches ([Table 2](#), p. 5). The first two moments of need (new and more) occur during the knowledge acquisition phase of the learning and performance lifecycle and are typically addressed through formal instruction (i.e., IAT, SET, and PMT) because the individual is either learning the material for the first time or learning more (Malamed, 2013; Mosher & Gottfredson, 2010). While the approaches in [Table 2](#) (p. 5) are only possible approaches and not an exhaustive list, during the first two moments of need, Malamed (2013) suggested a blended learning approach. In a blended learning approach, mobile learning could be used to support formal classroom instruction by assigning students homework to complete on their own using MLT. Furthermore, during the second moment of need (i.e., when wanting to learn more), Malamed (2013) specifically listed mobile learning as a potential approach to meeting this need.

The remaining three moments of need are encountered during the knowledge application phase (i.e., during a mission, within the operational environment) and are typically addressed through informal types of learning, such as performance support. When trying to remember or apply knowledge, when things change, or when something goes wrong, learners need performance support, or context-based learning, for successful knowledge application (Ford, n.d.). [Table 2](#) (p. 5) provides mobile performance support as a possible learning approach to meet all three of the application of knowledge moments of need. In addition to performance support, other informal learning approaches can also meet the application of knowledge moments of need. For instance, when something goes wrong, Malamed (2013) indicated that a possible learning approach is to use forums or microblogging (e.g., Twitter). Both of these potential learning approaches can be accomplished through the use of MLT, such as iPhones or iPads.

Table 2. Moment of Need and Learning Approach

Moment of Need	Possible Learning Approach
When learning for the first time	eLearning, blended learning, virtual classroom, self-study
When wanting to maintain/learn more	eLearning, blended learning, virtual classroom, self-study, mobile learning
When trying to remember or apply	Performance support (online or offline), manual, mobile performance support
When problems arise or something goes wrong	Help Desk, FAQ, mobile performance support, forums, microblogging (Twitter, Yammer), wikis, IM
When something changes	Performance support (online or offline), documentation (pdf, Word), mobile performance support, microblogging (Twitter, Yammer), wikis, IM

Source: Malamed (2013) http://thelearningcoach.com/elearning_design/working-with-the-five-moments-of-need/

Conclusion 3: MLT should not completely replace traditional formal learning but can be a powerful supplementary tool or performance support mechanism.

Based on the literature, we conclude that the limitations of MLT and the lack of interaction with a live instructor make it ill-suited to completely replace the traditional classroom-based learning experience. When used as a supplement to traditional learning, MLT can be a powerful training tool able to fill in gaps in traditional learning and offer increased flexibility and access to content that students might not otherwise have. Haag (2013) echoes this sentiment and states that mobile learning should not be used as a replacement or alternative to traditional forms of teaching, but used in a complementary way to augment or enhance learning (e.g., blended learning approach). While mobile learning may not always be appropriate as an independent formal training solution, it is now being considered as a part of the total Department of Defense (DoD) learning and training support infrastructure (Advanced Distributed Learning [ADL] Co-Laboratories, 2011).

While MLT may be more useful in an informal learning environment, it should not be thought of as synonymous with informal learning, as it can play a role in both formal and informal learning. Surface (2012) discussed Kraiger's (2008) instructional models in the context of a training needs assessment, but a similar thought process applies here in the context of learning and MLT. In the first generation instructional model, the organization defines (1) the content and design of the training (i.e., learning), (2) for whom training is required, and (3) how and when the training will be delivered. MLT could be useful here in a blended learning approach – learning in an instructor-led classroom, supplemented by individual work outside of the classroom. In the SOF language learning context, this blended learning approach with the use of MLT could be utilized during IAT.

In the second generation instructional model, the shift is to learner-centered instruction (Kraiger, 2008). The organization still identifies and specifies the training requirements and supports the learner by providing formal training opportunities and resources, but the learner has more control over his training experience (Surface, 2012). This follows a more informal learning approach, but can also be consistent with a formal learning approach. With the use of MLT, the learner can dictate when and how often the learning occurs, within the confines of the learning content specified by the organization. In the SOF language learning context, this would be appropriate during formal (e.g., instructor-led) or informal (e.g., individual study time, test preparation) SET.

Lastly, in the third generation instructional model, learning is socially constructed (Kraiger, 2008). Individuals and their teams share the learning process, and the organization becomes the facilitator of the process. The organization still ensures the learning activities are aligned with the strategy and business goals and objectives, but the learner and his team are able to define and address their learning needs (Surface, 2012). Here, learners can use MLT to interact with others in an informal learning environment. For instance, in the SOF language learning context, operators could use mobile technology devices to connect to the Special Operations Forces Tele-training System (SOFTS; i.e., a virtual classroom) and speak with individuals who speak the target language to practice their language skills, but not in a formal virtual classroom environment.

MLT is particularly well-suited for performance support. Performance support tools are technological tools that provide critical information or advice needed to move forward at a particular moment in time (McManus & Rossett, 2006). Mobile devices, like smartphones and tablets, can be the means for doing this by supporting a worker anytime and anywhere. However, there is a downside if the performance support tools are cumbersome and create barriers to communication (SWA Consulting Inc., 2010b). Performance support tools should fit the mission tasks and contexts and facilitate the effectiveness of those using them. Judgment should be applied; there are tasks and contexts where MLT would not enhance effectiveness and might create issues.

In the SOF context, it may be best to consider performance support tools in two ways – those that would be used **prior** to the task/mission (i.e., “just-in-time” [JIT] learning) to refresh one’s memory or those that would be used **during** (i.e., while performing) the task/mission. JIT learning can be useful for pre-deployment language training, especially when the deployment may be outside of the SOF operator’s area of responsibility (AOR). Mobile devices such as smartphones or tablets can be used at the convenience of the SOF operator to learn key words and phrases in the target language immediately prior to deployment. The use of performance support tools in this context allows SOF operators to learn the language skills needed “just-in-time” to be able to perform the language skills on their own (i.e., without the aid of a performance support tool). This is in contrast to using performance support tools while actually performing a task/mission.

Performance support tools can also be used during the task/mission. However, the use of performance support tools in this context should be carefully considered. In some circumstances, it may be detrimental for SOF operators to use a performance support tool (e.g., Phraselator, mobile phone) while performing the language-related mission tasks. For instance, outsourcing the language skills to a mobile device rather than speaking the language oneself may create communication barriers or be insulting in some host nation

countries. It is important to consider the context and situation in which a performance support tool is being used.

Conclusion 4: As a SOF operator encounters each of the five moments of learning need, the learning context becomes more informal and the potential role of mobile learning increases.

[Figure 1](#) (p. 8) depicts how each moment of need aligns with SOF language learning and performance contexts (i.e., IAT, SET, PMT, operational environment, and JIT learning). As a SOF operator encounters each of the five moments of learning need, the learning context becomes more informal and the potential role of mobile learning increases.

Across formal classroom environments, the opportunities to use MLT are similar, relative to the time available for training, regardless of the point within the SOF operators' language training trajectory (e.g., IAT, SET, PMT). For example, using a smartphone to practice vocabulary drills is a viable language learning activity that SOF operators can engage in throughout the course of their careers. However, given the variability in training characteristics between SOF components as well as units, there is more opportunity for informal learning in some training contexts than others. For example, IAT is typically more institutional in nature and is characterized by lengthy multi-week sessions, organizationally-driven learning goals and objectives, and large amounts of instructor-student interaction¹. Although IAT is a more formal learning approach, the use of MLT could still be effective in this environment as part of a blended learning solution, but it must be truly integrated for class activities, homework, and self-directed study. Mobile learning devices could be supplied to SOF operators to supplement their classroom instruction. Instructors could assign particular lesson to be completed as homework assignments via a mobile device or SOF operators could use the device for informal individualized study or for class activities, but instructors would need training on integrating devices into the existing curriculum. Curriculum designers/developers would need to explicitly build MLT into future curricula and materials.

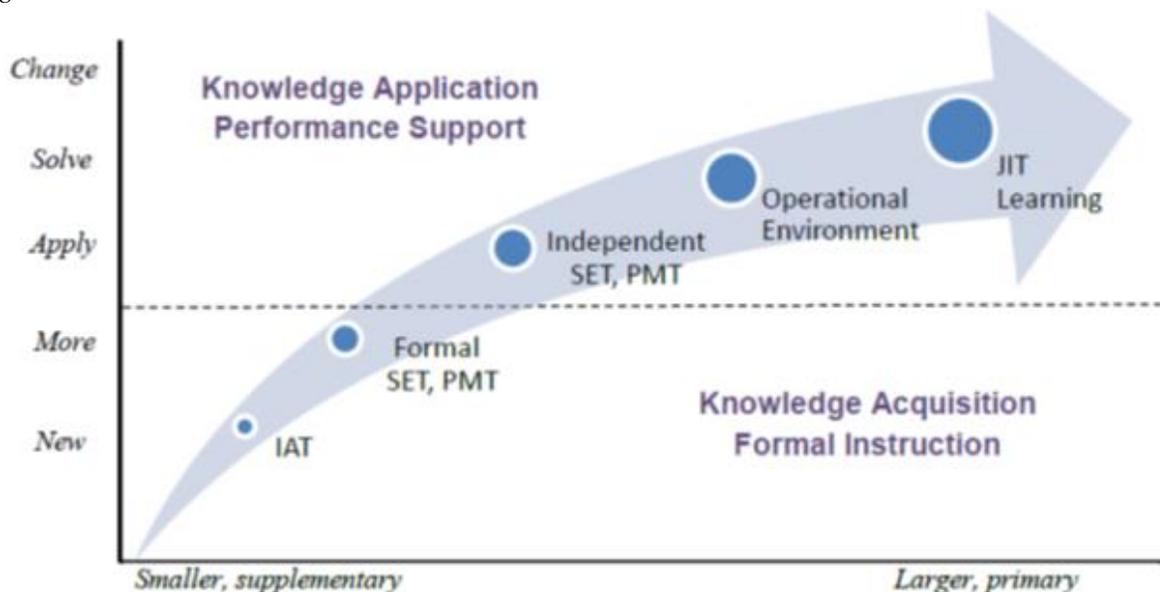
In the SOF environment, SET and PMT can be part of a formal or informal learning approach. In many cases, SOF components and units have formal (i.e., instructor-led classroom training) SET and PMT available. In these situations, MLT would be useful in a blended learning environment, as suggested in regards to formal IAT. In other instances, SET and PMT tend to be more variable in terms of instructor and resource (e.g., language lab, tutor, virtual training) availability, and in general, follow a less consistent path than IAT². There is more variability in how, when, where, and how often a SOF operator engages in SET and PMT due to other training requirements, deployments, or demands on a SOF operator's time. SOF operators also engage in more informal SET in preparation for their annual proficiency tests (e.g., OPI). This preparation is not likely conducted in an instructor-led classroom environment, but as independent study on the SOF operator's own time.

¹ This is a very high-level broad description of SOF IAT language training intended to describe very high level characteristics of the context. We acknowledge there may be significant variability in training contexts across branches, components, units, etc.

² This is a very high-level, broad description of SOF SET and PMT language training intended to describe very high-level characteristics of these contexts. We acknowledge there may be significant variability in training contexts across branches, components, units, etc.

In these contexts, there is more opportunity for MLT to play a larger role in the sustainment and maintenance of language skills. Providing SOF operators with a mobile device, such as a tablet, for independent SET or PMT allows SOF operators the flexibility to study on their own time and in any location. This would be invaluable on deployment. In this context, nearly all language learning is SOF operator-driven, as the SOF operator accesses the language content when and where the context demands it. This pervasive need for sustaining and maintaining language capability and the lack of formal training and other resource (e.g., instructors, often times Internet connectivity) availability are what make the operational environment the most fertile ground for the incorporation of MLT.

Figure 1. The Role of MLT



Overall Recommendations

The following recommendations for incorporating MLT into the SOF language learning context are based on the idea that as the formality of training decreases, the potential role of MLT increases.

IAT

As a result of the nature and purpose of the learning that takes place during IAT, the most effective role of MLT will be primarily as a support, supplement, or tool to augment traditional learning. However, the use of MLT must be effectively blended into the course. While possible, it may be difficult to use mobile devices as a primary learning delivery mechanism for IAT due to training length, intensity and complexity of training content, and potential limitations of mobile devices. Therefore, we recommend that MLT be used to support or augment traditional classroom-based learning as part of a blended solution. MLT can be used for class activities, assigned homework, and self-directed learning outside of the classroom (e.g., personal study time). Also, using MLT in a supplementary role during IAT could help students familiarize themselves and gain comfort and self-efficacy in using MLT for language learning in a support-rich environment. These increases in familiarity, comfort, and self-efficacy could

pay dividends during later use of MLT in less support-rich environments, such as SET, PMT, and operational contexts. Additionally, MLT could be used as a change-of-pace option to add variety to IAT and increase (or regain) student engagement.

It is important to note language resources and content provided on a mobile learning device must be aligned with the course learning objectives and content. Alignment in IAT is very important because it ensures SOF operators are adequately prepared to meet the language-related requirements of their missions. The content and context of trained materials, whether formal or informal, should align with the capability needed to support mission performance, which can be captured with a thorough needs assessment (Surface, 2012).

SET & PMT

In the SOF community, SET and PMT can take place as formal or informal language training; however, the primary functions of both are the same: (1) to help SOF operators maintain or enhance their target language proficiency acquired during IAT and (2) to prepare SOF operators for language proficiency testing (e.g., OPI), which could ultimately lead to foreign language proficiency bonus (FLPB), promotions, or participation in advanced training programs. Consistent with formal IAT, we recommend that MLT be used primarily as a tool to supplement the classroom, instructor-led training in a blended learning solution during formal SET and PMT. Due to some of the limitations of MLT, such as small screen size, it may be difficult to use MLT as a primary learning delivery mechanism, but it is well-suited for use as a practice, consolidation, and drilling tool. The use of mobile learning devices can be integrated into class activities, homework, and self-directed study outside of the classroom. We feel that during formal SET and PMT, MLT can be applied in a more prominent supplementary role than IAT, but it is not recommended as the primary learning delivery mechanism.

MLT offers another advantage that is particularly valuable in the formal SET and PMT context: the ability to adapt to the individual learner's needs. SOF operators participating in SET and PMT represent a more heterogeneous group of learners in terms of proficiency levels than the SOF operators enrolled in IAT (i.e., most SOF operators have no proficiency at the start of IAT, but proficiency levels are mixed into the same class during SET and PMT). Therefore, they need varied levels of training. In other words, the customization to the individual learner offered by MLT is more important in SET and PMT than during IAT.

Additionally, when the SOF operator wants to go beyond the mandated formal language training and engage in language and culture learning for self-development or other personal reasons, MLT, with its high level of accessibility anytime, anywhere and the ability for the user to customize the learning to their individual needs, could be an attractive option. This would also be useful in preparation for annual language proficiency testing. SOF operators could use MLT to study the areas where they need the most practice (i.e., creating that individualized training solution). This can be thought of as informal SET or PMT. Another example of using MLT for informal SET would be if a SOF operator, after completing IAT, realizes that he is confident in one area of the language (e.g., giving commands), but has difficulty with another area (e.g., asking/answering questions). He can target his efforts on becoming more confident in the areas in which he needs to strengthen his skills.

Performance Support in an Operational Environment

Based on our review of the current literature, our recommendation aligns with previous research (Haag, 2013; Udell, 2012), supporting the notion that the best opportunity for mobile learning within an organization will likely be in the performance support area.

In the SOF context, it may be best to consider performance support tools as those that would be used **prior** to the task/mission (i.e., JIT learning) and those that would be used **during** (i.e., while performing) the task/mission. Via MLT, a SOF operator can review the vocabulary, greetings, or other linguistic and/or cultural information needed for the tasks/duties they will be conducting during a near-term mission task. For example, a SOF operator going into a negotiation with tribal elders during Ramadan could use his mobile device to access and review appropriate greetings, customs, and key vocabulary immediately **prior** to the engagement so that he does not have to rely on his ability to remember language training that may have occurred months or even years in the past. In these performance support situations, a mobile device could be used as a type of “external hard drive” to extend the SOF operator’s memory and augment past training by providing “just-in-time” language and cultural information. These situations allow the use of a performance support tool in a form that is typically more portable and can be searched more rapidly than traditional performance support tools (e.g., dictionaries), while still containing a large amount of information (e.g., a cell phone). As a note of caution, the use of mobile devices in the actual performance context (i.e., during) may create a barrier to communication and interfere with other aspects of the mission because of the cumbersome nature of using devices. Although cell phones may not be as cumbersome to carry as other devices, previous studies indicated that some performance support tools (e.g., Phraselator) can be cumbersome to carry and can be detrimental to building rapport in some host nation countries (SWA Consulting Inc., 2004; SWA Consulting Inc., 2010b).

In sum, due to the limitations of MLT, it should be not considered the “magic bullet” or solution to all barriers associated with SOF language training. However, it does offer many significant and unique features which make it a powerful supplementary tool that we recommend integrating into both formal and informal SOF language training. We also conclude that while MLT could be useful in formal learning situations in a blended learning approach, the SOF contexts with the most potential to leverage the benefits of MLT are during SOF operator-driven informal learning and in an operational context in a performance support role.

MLT: A Step towards Lifelong Learning

Informal learning happens throughout the course of a SOF operator’s professional career and spans the entire training and deployment cycle. Lifelong learning, a type of informal learning and one of the most important 21st century Soldier competencies, is the “...individual lifelong choice to actively and overtly pursue knowledge, the comprehension of ideas, and the expansion of depth in any area to progress beyond a known state of development and competency” (U.S. Department of the Army, 2011, p. 67). Specifically, the U.S. Army Learning Concept 2015 (ALC; U.S. Department of the Army, 2011) states that “Soldiers must become expert, self-motivated learners who are capable of asking good questions and possess digital literacy skills that enable them to find, evaluate, and employ online knowledge, whether in learning or operational environments” (p. 14). This vision of active, agile-minded, dynamically adaptable SOF operators is achievable by adopting an orientation towards lifelong learning. Further, the emphasis on digital literacy skills within the context of lifelong learning illustrates the usefulness that MLT could

have for a SOF operator over the course of his career. MLT allows SOF operators to access information across all learning contexts, from IAT to PMT, inside and outside of formal learning contexts, allowing them to increase their knowledge base on their own schedule and continue improving their language skills.

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SECTION I: REPORT RATIONALE & OVERVIEW

Report Rationale

The ability to communicate in a foreign language is often critical to Special Operations Forces (SOF) mission success. According to the United States Special Operations Command (USSOCOM) “language is a key component of SOF tasks” (USSOCOM, 2009, p. 18). SOF operators indicated they need foreign language skills to perform many mission tasks, including training foreign nationals, persuading people to provide sensitive information, and maintaining control in hostile situations (SWA Consulting Inc., 2010a). SOF operators commonly describe instances when speaking the foreign language is critical for building rapport with the host nation. For example, one SOF operator noted, “*Whenever you deploy anywhere, to work with anyone, and you don’t have enough language capacity to build rapport, then you’ve got a problem*” (SWA Consulting Inc., 2010a, p. 7).

Language training plays a vital role in preparing SOF personnel for mission success. The goal of SOF language training is to produce language capable SOF operators and support the maintenance of those language skills throughout SOF operators’ careers. The SOF community faces many challenges when trying to deliver language training to SOF operators who have limited time due to competing requirements, who may be geographically dispersed (e.g., National Guard), and who have changing mission requirements. Making language training efficient and effective, while still developing and maintaining the required capability, has become a necessity. To meet these needs, the SOF community has explored some technology-delivered training (TDT) options, such as computer-based language learning software (i.e., CL-150™, Rosetta Stone®) and virtual classrooms (i.e., Special Operations Forces Tele-Training System [SOFTS]).

SWA has conducted several studies in which information related to the use and effectiveness of various TDT options has been collected. SOF operators have expressed interest in training which incorporates technology. In the *2009 SOF Language and Culture Needs Assessment (LCNA)* project, SOF operators appeared to prefer technology-based language training materials over more traditional materials for self-study. When asked about four self-study language training material formats, most SOF operators (63%) preferred PC-based materials to flash cards (15%), audio-based materials (12%), or books (11%; SWA Consulting Inc., 2010b). However, when it comes to the evaluation of existing TDT in initial acquisition training (IAT) and sustainment/enhancement training (SET) programs, the findings are mixed.

SOF operators who attended IAT at the U. S. Army John F. Kennedy Special Warfare Center and School (USAJFKSWCS) reported low satisfaction ratings for the available language-learning software or web-based tools. Just over 50% of the SOF operators reported being satisfied with these tools and programs (SWA Consulting Inc., 2012).

In the *2009 SOF LCNA* project, most SOF operators reported receiving SET at their unit’s language lab and/or through classroom instruction delivered at their unit’s command language program (CLP). Additionally, 93% of SOF leaders indicated that their unit’s CLP offered classroom instruction and 89% offered self-paced instruction (CDs, tapes, etc.). Furthermore, 72% indicated their unit’s CLP offered one-on-one tutoring and 31% offered SOFTS courses (SWA Consulting Inc., 2010c). Though some language learning technology resources are available for SOF operators (e.g., Rapid Rote, Special Operations Language Training [SOLT]), their comments indicated several issues associated with the use

of these resources, such as limited access while deployed and limited time to use resources while on duty (SWA Consulting Inc., 2010c). Overall, SOF operators indicated that instructional technology was the least effective aspect of their most recent SET experience in relation to the course/training itself, the materials/curriculum, their instructors, and the training environment (SWA Consulting Inc., 2010c).

While some use of TDT has been received favorably (e.g., SOFTS; SWA Consulting Inc., 2013), SOF operator feedback suggests there is room for improvement. These studies show that technology is used in a limited way across the SOF community and that there is quite a bit of variability in how TDT options are incorporated in IAT and SET programs. One potential technology solution that has not been widely used in the SOF community is mobile learning technology (MLT). MLT has been identified as a potential solution or mechanism for supporting language learning, particularly for those SOF operators who do not have consistent access to face-to-face or classroom training (e.g., National Guard). MLT may represent an opportunity to increase the language opportunities available to SOF operators by creating a way to access training when and where they need it. This report will focus on this currently underutilized support tool that may help USSOCOM to better achieve its language training goals.

To evaluate whether MLT can be used in the context of SOF language training, this report describes current trends, best practices, uses, and potential options suitable for the use of MLT in SOF language training contexts. This report also investigates how and what MLT devices could be applied in multiple SOF language training contexts (specifically IAT, SET, and pre-mission training [PMT]) to facilitate both formal and informal learning. This is timely in that many language vendors are starting to offer mobile learning solutions that integrate with their web-based software solutions designed for desktops and laptops.

Report Overview

This report contains five sections, which review the current literature on mobile learning, identify potential approaches to incorporating mobile learning technologies in SOF language training and for potential use in a performance support role in the operational domain, and provide recommendations to SOF leadership for incorporating MLT into SOF language learning contexts. The following is a brief synopsis of each section:

- I. **Report Rationale and Overview (p. 13):** Describes the purpose and scope of the report.
- II. **Why Mobile Learning (p. 16):** Examines attitudes and posture of the military on the current training challenges and the potential role of MLT to help meet these challenges through the lens of the *U.S. Army Learning Concept for 2015*.
- III. **Mobile Learning Technology: Definition, Description, and Best Practices (p. 18):** Provides a definition of MLT as well as a description of both limiting and enabling characteristics. Industry best practices are also discussed.
- IV. **Mobile Learning Technology: When does it make sense? (p. 23):** Discusses factors to consider when determining the usability and appropriateness of incorporating MLT into a language training context.

- V. **[Recommendations for Leveraging MLT in SOF Language Learning Contexts](#) (p. 29):** Provides recommendations specific to each SOF language learning context as to how to effectively incorporate MLT into SOF language training.

There are three appendices that provide the reader with additional background information, details, and a decision-making framework to assist SOF leadership in making decisions about the appropriateness of using MLT at the specific task level. The reader is encouraged to consult each of the appendices to obtain more information on these topics. The following is a brief synopsis of each appendix:

1. **[Appendix A](#) (p. 45):** Background information on MLT to help orient the reader to two overarching questions: 1) What are the key differences between mobile learning (mLearning) and eLearning? Which devices are “mobile” and which are not?
2. **[Appendix B](#) (p. 48):** Potential challenges and decision points SOF leadership should consider when evaluating the possibility of incorporating MLT into SOF language training.
3. **[Appendix C](#) (p. 51):** To complement the broad recommendations concerning the incorporation of MLT into SOF language training made in the main body of the report, this appendix presents SOF leadership with a more granular decision-making framework that evaluates the feasibility of replacing traditional, live instruction with virtual, technology-based training for SOF language instruction at the specific task level.

SECTION II: WHY MOBILE LEARNING?

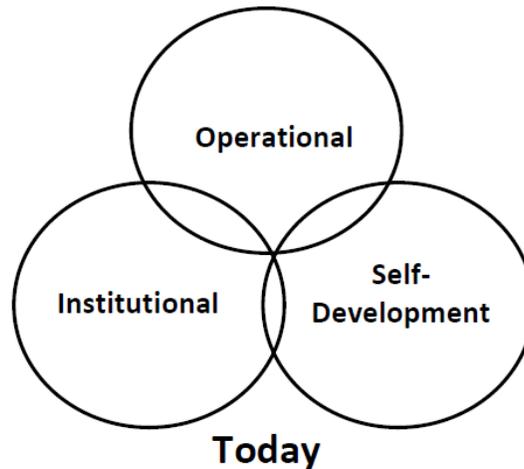
Mobile learning technology (MLT) has been proposed as a solution to many different training challenges faced by organizations across a wide range of fields and industries. The use of MLT to mitigate training challenges and to keep up with the ever-shifting training needs of today's workforce has received recent attention at several industry-leading conferences, including the Interservice/Industry Training, Simulation, and Education Conference (IITSEC, December 2012), the American Society for Training & Development Techknowledge Conference (ASTDTK, January 2013), the American Association for Applied Linguistics Conference (AAAL, March 2013), and the International Conference on Language Teacher Education (ICTLE, June 2013). The following presentation titles from these conferences highlight some of the main focal areas for research related to MLT: "Integrating Technology in the Second/Foreign Language Classroom" (Salem, 2013), "Improving Sales Performance with Mobile Training and Assessment" (Jass & Place, 2013), "Designing M-Learning: Beyond Courses on a Phone" (Quinn, 2013), and "Not Just for Angry Birds, Practical Training with Mobile Devices" (Borkman & de la Cruz, 2012).

MLT is not only being considered as a training solution in civilian contexts but in the military as well, to include USSOCOM. In fact, MLT may be an even greater advantage in the military than in the civilian workforce. SOF operators are compelled to learn faster and more effectively to prepare for current and future missions to maintain an operational edge. "The U.S. Army's competitive advantage directly relates to its capacity to learn faster and adapt more quickly than its adversaries" (U.S. Department of the Army, 2011, p. 9). Though this statement was taken from an Army document, we believe it generalizes to all branches of the Armed Forces, as they all face similar challenges and have the same common goal: to protect the nation from adversaries.

The U.S. Army Learning Concept (ALC) is a forward-looking document which describes a vision for the learning environment in 2015. While this document is Army-specific, many of the points can be broadly applied to all SOF components. This document includes a focus on technology-delivered training (TDT), and mobile learning, in particular as solutions to challenges faced by the military. The rapid pace of technological change increases the challenge put to SOF, "to maintain the edge over potential adversaries. In the highly competitive global learning environment where technology provides all players nearly ubiquitous access to information, military leadership cannot risk failure through complacency, lack of imagination, or resistance to change" (U.S. Department of the Army, 2011, p. 9).

The ALC 2015 describes the current Army learning environment and model. The model consists of three learning domains: (1) institutional, (2) operational, and (3) self-development ([Figure 2](#), p. 17). Since this model was designed to support our military forces during peacetime, it has only a limited ability to meet the quickly changing needs of today's SOF operators. In the past, these three learning domains have functioned in primarily independent roles; however, the ALC 2015 calls for a more integrated, synchronized approach to create a culture of learner-centric, lifelong learning for each SOF operator. Supporters of MLT claim that it has the capability to help leaders, including those in SOF, adopt this more integrated and dynamic posture towards language training.

Figure 2. Illustration of Current Army Domains of Learning Model



U.S. Department of the Army, 2011, p.44.

One of the projected changes called for in the ALC 2015 related to technology is a move away from traditional, formal learning to distributed learning because it is believed that traditional, static language learning mechanisms (e.g., formal classroom training) will be greatly challenged to meet the needs of SOF operators in a high operations tempo (OPTEMPO) context with ever-changing environments, demands, and adversaries. Another projected change is a new emphasis on providing training materials “at the point of need.” To develop adaptive SOF operators capable of meeting the challenges of operational variability in an era of persistent conflict, the ALC 2015 emphasizes a goal to provide training materials to leaders and SOF operators “at the point of need” throughout their careers, instead of only during dedicated schools at certain times. Another projected change is a shift from the current mode of discrete training segments to a “learning continuum that blurs the lines between Operational Army and Generating Force by meshing together self-development, institutional instruction, and operational experience” (U.S. Department of the Army, 2011, p. 5). The vision behind this meshing is to create a learner-centric environment where learning begins as a new recruit and continues until retirement.

While the ALC 2015 identifies MLT as a solution to many of the training challenges that are currently being faced within SOCOM, the document does not provide specific guidance about incorporating MLT into learning systems. In this document, we define MLT and outline best practices³ for incorporating MLT into a training system. Then, we make specific recommendations about when and how to implement MLT in the SOF context.

³ This is a rapidly changing field, so this is based on our review in Spring 2013.

SECTION III: MOBILE LEARNING TECHNOLOGY: DEFINITION, DESCRIPTION, AND BEST PRACTICES

While there is no widely agreed upon definition of mobile learning, many of the existing definitions tend to focus on either the mobility of the learner (i.e., learner-centric) or on the use of mobile devices (i.e., device-centric; ADL Co-Laboratories, 2012). For example, Woodill (2012, p. 34) offers a learner-centric definition: “Mobile learning is where a learner can be physically mobile while at the same time remaining connected to non-proximate sources of information, instruction, and data communications technology.” Alternatively, Keegan’s (2002, p. 24) definition emphasizes the use of mobile devices: “Mobile learning should be restricted to learning on devices which a lady can carry in her handbag or a gentleman can carry in his pocket.”

For the purposes of this report, we chose to use a more inclusive definition that considers both the learner and the device. Specifically, we adopted Brown’s (2010, p. 28) definition of mobile learning as the “exploitation of ubiquitous handheld technologies, together with wireless and mobile phone networks to facilitate, support, enhance and extend the reach of teaching and learning.” This definition does not limit the particular technology used, nor the context in which it is used; therefore, it offers a flexible definition that still adequately and succinctly describes the concept of mobile learning. Smartphones, iPads, and PDAs are some examples of mobile devices. It is important to note that Brown (2010) does not consider laptop computers to be mobile devices. Laptop computers are not considered “handheld” devices and, therefore, will not be considered a mobile learning device in this report.⁴

Mobile learning is typically shorter in duration, in comparison to distance learning or e-learning. Mobile learning is also usable in an on-demand format and allows users to customize and create content and offers data entry capabilities (Brown, 2010).⁵

In context of learning, many different mobile devices with a variety of features can be used. Although there are many different types of mobile and wireless devices, Tucker (2010) describes them as sharing common enabling features (Table 3, p. 19). These enabling features could help MLT meet the current and future language training needs of SOF operators by offering a learning/content delivery mechanism with some unique advantages over traditional, more static learning mechanisms (e.g., traditional classroom). Some of the characteristics offered by MLT, such as portability, flexibility, and customizability, could help SOFLO adapt its language training capabilities to keep pace with the ever-changing training needs of the SOF operator.

⁴ See [Appendix A](#) for additional information regarding which devices are considered mobile and which are not.

⁵ See [Appendix A](#) for additional definitions, descriptions, and background information about mobile learning technology.

Table 3. Enabling Features of MLT*

Enabling Feature	Definition/Explanation
Connectability	Connect to the Internet wirelessly via wireless fidelity (WiFi).
Portability/wearability	Always at the fingertips of the user; one can access lessons, video clips and audio libraries from anywhere, including public places and moving buses and trains.
Instant accessibility	Instantly turn on and off.
Flexibility	Non-temporally dependent learning, as students can access the system anytime 24-7 and from any location. Instructor support possible outside classrooms and other learning environments.
Economic viability	Have much of the computing capability and expandable storage capacity of laptops at a fraction of the cost.
Social interactivity	Collaboration, active participation, co-creation of knowledge, and critical reflection.
Context sensitivity	Ability to gather data unique to the current circumstance (location, time, etc.); affords access to authentic contexts.
Individuality	Flexibility for each individual to follow a self-directed, personalized, custom learning path (Brill & Park, 2008; Chuang, 2009; Dieterle, 2004, as cited in Dieterle, 2005; Looi et al., 2009; Peters, 2007).

*Adapted from Tucker, 2010.

Mobile learning represents a flexible learning mechanism to aid SOF operators in achieving their goal of language-capability in an operational environment. Its inherent flexibility can be leveraged in a variety of ways and offers SOF leadership a potent resource with which to augment language training in a variety of ways to achieve multiple purposes, including:

- Micro-learning: self-paced mini lessons in varied media (e.g., podcasts)
- Synchronous: virtual classrooms using mobile webinar tools
- Assessments: tests, surveys, polls
- Social media learning: enabling networks for learning
- Learning games: challenges and simulations
- Performance support applications

Despite its many advantages and variety of potential uses, mobile learning is not always the most appropriate training solution. There are also several limitations that must be considered (Table 4, p. 20). Many limitations are in relation to the type of technology being used (e.g., mobile phone), such as small screen size, limited battery life, and the small size of the buttons. When considering the use of mobile learning devices as performance support tools for SOF operators, one should also keep in mind the portability of these devices. In previous studies conducted by SWA, SOF operators indicated that while performance support tools, such as the Phraselator, are portable, they are often not portable in a practical way for SOF operators and they can create barriers to communication. These tools can be cumbersome for SOF operators to carry on certain missions in addition to necessary military equipment they are

carrying and may create barriers to communication/rapport building (SWA Consulting, 2004; SWA Consulting, 2010b).

Table 4: Limiting Features of Using Mobile Technology for Learning

Limiting Features
Small screen size (anything more than short interactions can cause user visual fatigue).
Smaller disk capacity and computer memory (RAM) allotment than that of a laptop or desktop.
Limited battery life between charges.
Variability in connectivity (may not always be able to connect to the Internet).*
Small size of buttons/other interactive features.
User is more vulnerable to distraction or interruption while engaging in mobile learning than traditional learning (e.g., phone ringing or receiving text messages while reviewing vocabulary).
May be cumbersome in some work environments and create communication barriers when used as a performance support tool during the mission.

*It should be noted that many programs now offer offline models that will sync once back online (e.g., CL-150™, Rosetta Stone®).

It is important for MLT designers to take into consideration both the advantages of MLT and the technical limitations associated with MLT devices. [Appendix B](#) (p. 48) provides a more extensive discussion of the key technical considerations that decision-makers will face when evaluating the possibility of incorporating MLT into language training.

To most effectively leverage the advantages and mitigate the effects of the limiting features of MLT, industry experts and developers have generated a set of best practices to help organizations interested in incorporating MLT into employee training and development efforts ([Table 5](#), p. 21). The main idea behind the best practices is that you cannot take existing classroom or e-learning and simply put it on a mobile device. When using MLT, the message should be simple and the training design should be appropriate for short interactions.

Table 5. Mobile Learning Best Practices*

Mobile Learning Best Practices
Keep your mobile messaging short and to the point.
In mobile learning, you must provide an easy-to-use interface, but ensure the content is credible. You want to maintain the “from-the-expert” feeling to ensure the learners realize that the content is important.
Consider making instructor-led content easy to navigate. A branching, highly browsable interface arranged by topic or task may be a great option here.
Provide a search or query function so learners can interact with the system and find the information they want. Smartphone users tend to interact with their devices anywhere from about 10 seconds to four minutes (Falaki et al., 2010, p. 4). Strive to keep the information easy to understand in that short amount of time.
Mobile learning devices have a far smaller disk capacity and computer memory (RAM) than laptops or desktops. Use guidelines from the device manufacturer to determine the appropriate media encoding and file size for selected delivery formats.
The mobile learning technology user interface must be more concise and straightforward than anything you may be building for your eLearning.
User data from “offline” modes should synchronize with the learning management system when back online.
Simplify, simplify, simplify.

*Adapted from Udell, 2012

By adopting industry best practices during the incorporation of MLT into SOF language training, SOF leadership could allay some of the potential challenges posed by the limitations of using MLT as a language training delivery mechanism. These can be incorporated into requirements when purchasing or developing MLT.

In addition to these technical best practices, there are also key user considerations that must be taken into account when adopting new technology. One of those considerations is access to MLT and another is user comfort or familiarity with MLT.

There is a convergence of the demographic groups of active military personnel and smart device users with 54% of people between the ages of 18 to 24 and 62% of people ages 25 to 34 using smartphones (Nielsen Company, 2011). In short, the military is now composed of a generation of people whose use of mobile devices is second nature and who expect and rely on that type of computing power at their fingertips (Borkman & De la Cruz, 2012), and these figures are projected to only grow as mobile devices become more and more a ubiquitous part of daily life. These figures are corroborated by a recent survey sponsored by the Office of the Deputy Assistant Secretary of Defense. The ADL Co-Laboratories Initiative conducted the survey in 2011 to investigate the current mobile learning landscape of the DoD. When asked about the future use of mobile devices within their organization for work-related purposes, half of the respondents reported either already using mobile technology (22%) or actively researching how to use mobile technology (28%). An additional 20% of respondents reported planning to use mobile technologies in the next 6-12 months for work-related purposes. Two-thirds of respondents indicated

having plans to use mobile technology in the next year (ADL Co-Laboratories, 2011). These figures suggest a large number of SOF operators may already be familiar with and have experience using smart devices in their personal lives.

However, the introduction of mobile technology to a group of learners unfamiliar with that technology has often been met with resistance. Kneebone, Nestel, Ratnasothy, Kidd, and Darzi (2003) found that some participants expressed anxiety about the process of using the smart devices (e.g., PDAs) which, they felt, might have been improved if they had more experience with the technology. Other researchers uncovered a recurrent theme of usability problems linked to small screen size (Waycott, 2004) or difficulty entering data into the device (Smordal & Gregory, 2003). However, Parr, Jones, and Songer (2004) investigated the effect of practice on the accuracy with which children entered data on a PDA and found their skill levels improved with practice (43% accuracy in post-test compared with 29% in pretest). These findings indicate some of the problems described by participants may have been reduced or eliminated if they had more experience with mobile technology (Clough, Jones, McAndrew, & Scanlon, 2007). Introducing MLT in a support-rich environment, such as IAT, may help to ameliorate some SOF operator resistance to using mobile devices, especially for SOF operators who are less experienced with MLT.

Wei-Han Tan, Keng-Boon, Jia-Jia, and Phusavat (2012) investigated the role of individual differences in the adoption of mobile learning. Their results indicated that perceived usefulness, perceived ease of use and subjective norms are positively associated with the intention to adopt mobile learning (Wei-Han Tan et al., 2012). This suggests that successful adoption of mobile learning by SOF operators may be influenced by how useful they perceive it to be to helping them acquire, maintain, and successfully utilize their target language skills. These results also suggest that subjective norms, or an individual's perception of whether people important to the individual think the behavior should be performed, also may influence successful adoption. In a SOF context, subjective norms would include things such as the degree of command support there is for mobile learning and what other SOF operators think about mobile learning.

While the learner's familiarity with technology is a key concern, it is also important to gauge the instructor's comfort and skill with technology, especially if MLT will be incorporated into formal classroom education. SOF language instructors may be less familiar with MLT, particularly in the context of language education, and incorporating this into SOF language education will require orientation and support.

As a final consideration, the adoption of MLT is only one step in the process of fully integrating MLT into SOF language training. MLT is a vehicle for delivering content and enabling practice for language learners. This content and the applications that support learning must be developed and designed to meet the unique needs of the SOF language learner based on a thorough needs assessment (Surface, 2012). In addition, once MLT is adopted and appropriate applications are available, it is important for students to use the tools effectively, appropriately self-regulate their own learning, and choose when the MLT is the best tool to use or when another learning approach is better able to meet their needs. The next section focuses on when it makes sense to incorporate MLT in SOF language training.

SECTION IV: MOBILE LEARNING TECHNOLOGY – WHEN DOES IT MAKE SENSE?

Even when utilizing best practices ([Table 5](#), p. 21), the limitations of MLT and the lack of interaction with a live instructor make it ill-suited to completely replace the traditional classroom-based learning experience. Instructor-led classes and other more traditional educational materials are designed to be consumed in traditional learning environments. These traditional environments are less vulnerable to distractions, context, and other real-world diversions that often make delivering a full course via MLT difficult or impossible (Udell, 2012). Haag (2013) echoes this sentiment and states that mobile learning should not be used as a replacement or alternative to traditional forms of teaching, but rather as a complementary way to augment or enhance learning (e.g., blended learning approach). While mobile learning may not always be appropriate as an independent formal training solution, it is now being considered as a part of the total Department of Defense (DoD) learning and training support infrastructure (ADL, 2011). The question then becomes, when and for what types of learning is MLT going to be the most effective?

Determining Usability/Appropriateness of MLT

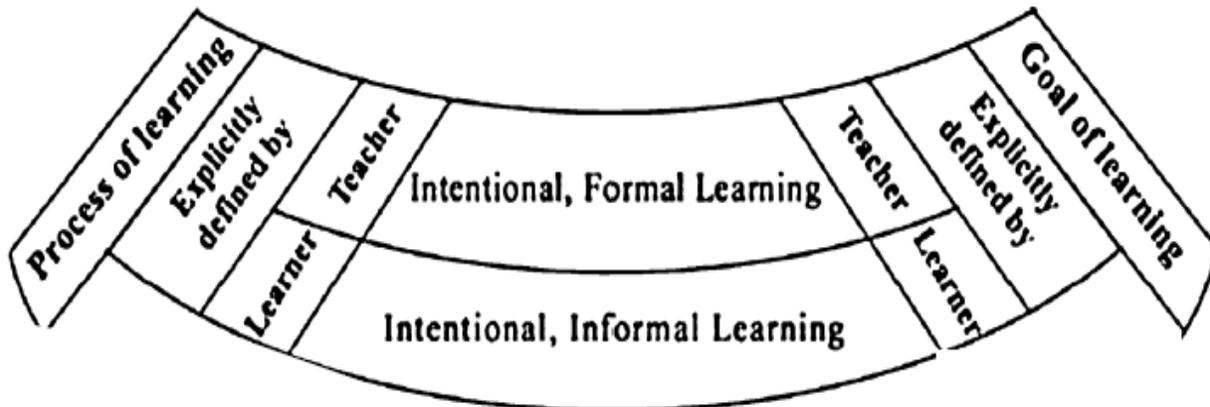
It is important to determine when it makes sense to use MLT and when might it be better to use a different learning delivery mechanism. Though MLT has many advantages, it is not a panacea and is not always the most appropriate training solution. The potential role and appropriateness of MLT used throughout a SOF operator's language learning career is largely dependent on (1) the type of learning and (2) the learning condition (i.e., the situation in which people require instruction or assistance).

Types of Learning

The potential role of MLT is dependent on several factors. One of the more influential factors is formality of the learning. The terms “formal” and “informal” learning can be misleading in that they have less to do with the formality of the learning, but rather focus more on the process of the learning and who controls the learning. In a formal learning environment (e.g., an instructor-led classroom), the organization defines the learning - for whom it is required, how and when the learning will be delivered, and sets the learning goals and objectives (Cofer, 2000; Surface, 2012). On the other hand, informal learning (e.g., Google searches) is at the discretion of the learner. In most cases, informal learning occurs without an instructor and the length, context, and time of the learning is up to the individual (Paradise, 2008; Surface, 2012). Depending on the informal learning context, the organization or the individual can define the goals and objectives of the learning. If the informal learning is part of a larger formal learning environment, then the ultimate goals and objectives may still be defined by the organization.

The Vavoula and McAndrew (2005) typology ([Figure 3](#), p. 24) categorizes learning according to whether and by whom the goals and processes of learning are defined. This typology subdivides the process embedded within the learning activity into two areas of control: (1) control over the process of learning, that is, the tools and methods used to learn and (2) control over the goals of learning: the expected learning outcome (e.g., the standard(s) used to determine if successful learning has occurred).

Figure 3. Typology of Formal and Informal Learning*



* Modified version of the Vavoula & McAndrew (2005) typology, excluding the section on unintentional learning because it is outside the scope of this project. *Note:* This is just an example. We realize that this figure may not always apply in the SOF language learning context. For instance, there may be overarching learning goals defined by the government, but the SOF operator (i.e., the learner) can define the learning process (e.g., informal SET).

In the SOF language learning context, formal learning can be characterized as command-driven, mandated learning that SOF operators are required to attend (e.g., IAT). The SOF operators themselves (the learners in this context), have little control over the learning process and goals. In contrast, informal learning can be characterized as primarily SOF operator-driven, with each individual SOF operator having the ability to determine the learning process (e.g., unassigned personal study time). The distinction between formal and informal learning in the SOF language learning context is primarily focused on the learning process itself because the end goal for both formal and informal language training is driven by job requirements, language proficiency testing policy (e.g., reaching an Interagency Language Roundtable [ILR] level 1 in participatory speaking as measured by the Oral Proficiency Interview [OPI]), and promotion policy (e.g., new for Special Forces [SF]). However, SOF operators can set goals beyond the standards required for their job requirements, proficiency pay, or promotion.

Informal learning can happen throughout the course of a SOF operator's professional career and spans the entire training and deployment cycle. Informal learning can happen at any time and in any context the SOF operator chooses, but tends to happen to prepare for proficiency testing (e.g., OPI) or deployment. It can happen inside a formal language learning context such as IAT (e.g., a SOF operator deciding to use a mobile application to listen to word pronunciation in the target language on his own time, not informal part of IAT), or outside of a formal learning context (e.g., a SOF operator watching a movie on a tablet in the target language during his down time).

Bell (1977) used the metaphor of brick and mortar to describe the relationship of formal and informal learning. Formal learning represents the bricks or the core learning objectives (i.e., knowledge, skill, and application components) of the learning system. Informal learning acts as the mortar, facilitating the development of the formal learning and filling in and solidifying any gaps the formal learning was not able to fill. He noted that informal learning should not replace formal learning activities, as it is this synergy that produces effective skill growth (Bell, 1977). Similarly, mobile learning should not replace

traditional instruction, rather it should be a means of supplementing, refreshing, or expanding it at the point of need.

While MLT may be more useful in an informal learning environment, it should not be thought of as synonymous with informal learning, as it can play a role in both formal and informal learning. Consider the use of MLT in Kraiger's (2008) three generations of instructional models. Surface (2012) discussed Kraiger's instructional models in the context of a training needs assessment, but a similar thought process applies here in the context of learning and MLT. In the first generation instructional model, the organization defines (1) the content and design of the training (i.e., learning), (2) for whom training is required, and (3) how and when the training will be delivered. This is consistent with formal learning in a classroom setting, where the learning is defined by the organization. MLT could be useful here in a blended learning approach – learning in an instructor-led classroom, supplemented by individual work outside of the classroom. The organization would provide the learners with the mobile technology devices (e.g., tablets) and specify the lessons to be completed outside of the classroom (e.g., homework). In the SOF language learning context, this blended learning approach with the use of MLT could be utilized during IAT.

In the second generation instructional model, the shift is to learner-centered instruction (Kraiger, 2008). The organization still identifies and specifies the training requirements and supports the learner by providing formal training opportunities and resources, but the learner has more control over their training experience (Surface, 2012). As in the first generation instructional model, the organization would be responsible for providing the learner with the mobile technology device, but the learning can be more customized to the learner. This follows a more informal learning approach, but can also be consistent with a formal learning approach. With the use of MLT, the learner can dictate when and how often the learning occurs, within the confines of the learning content specified by the organization. In the SOF language learning context, this would be appropriate during formal (e.g., instructor-led) or informal (e.g., individual study time, test preparation) SET. A minimum number of SET hours are dictated by USSOCOM in the M 350-8, but oftentimes it is the responsibility of the SOF operator to complete these hours and maintain his language proficiency. Pre-loaded (i.e., contain relevant language learning programs) mobile technology devices could be provided to SOF operators, but then it would be at the discretion of the SOF operator to study the material he needs to focus on, when he has time available.

Lastly, in the third generation instructional model, learning is socially constructed (Kraiger, 2008). Individuals and their teams share the learning process and the organization becomes the facilitator of the process. The organization still ensures the learning activities are aligned with the strategy and business goals and objectives, but the learner and his team are able to define and address their learning needs (Surface, 2012). Here, learners can use MLT to interact with others in an informal learning environment. For instance, in the SOF language learning context, SOF operators could use mobile technology devices to connect to SOFTS and speak with individuals who speak the target language to practice their language skills, but not in a formal virtual classroom environment.

MLT is particularly well-suited for performance support. Performance support tools are technological tools that provide critical information or advice needed to move forward at a particular moment in time (McManus & Rossett, 2006). Atul Gawande, author of *The Checklist Manifesto*, described the purpose of performance support when he said, "The volume and complexity of what we know has exceeded our

individual ability to deliver its benefits correctly, safely, or reliably” (Gawande, 2009, p. 34). He went on to suggest that, “We need a different strategy for overcoming failure, one that builds on experience and takes advantage of the knowledge people have but somehow also makes up for our inevitable human inadequacies” (Gawande, 2009, p. 34). Mobile devices, like smartphones and tablets, can be the means for doing this by supporting a worker anytime and anywhere. These are used to improve the productivity and efficiency of workers who are in the field by delivering information and support in context for their immediate priorities (Traxler, 2007). For example, Fletcher and Johnston of the Institute for Defense Analysis (1995) summarized studies of computer-based decision aids for military equipment maintenance. They found those who used the computer-based performance support tools when diagnosing equipment problems were speedier and more accurate and used fewer parts for repair than those with static materials (e.g., books, paper manuals; Fletcher & Johnson, 1995). However, there is a downside if the performance support tools are cumbersome and create barriers to communication (SWA Consulting Inc., 2010b). Performance support tools should fit the mission tasks and contexts and facilitate the effectiveness of those using them. Judgment should be applied; there are tasks and contexts where MLT would not enhance effectiveness and might create issues.

In the SOF context, it may be best to consider performance support tools in two ways – those that would be used **prior** to the task/mission (i.e., “just-in-time” [JIT] learning) to refresh one’s memory or those that would be used **during** (i.e., while performing) the task/mission. JIT learning can be useful for pre-deployment language training, especially when the deployment may be outside of the SOF operator’s area of responsibility (AOR). Mobile devices such as smartphones or tablets can be used at the convenience of the SOF operator to learn key words and phrases in the target language immediately prior to deployment. JIT informal learning can also be useful when downrange. For instance, a SOF operator may have a key leader engagement (KLE) the next day and needs to brush up on key words and phrases in the target language. Mobile devices could be used to provide this JIT learning; however, they may not be ideal to bring into an important KLE or similar mission type.

Learning tools can be cumbersome to transport in addition to all of the necessary military gear or may be offensive and can create barriers to communication when engaging with certain cultures (SWA Consulting Inc., 2004; SWA Consulting Inc., 2010b). Host nation leaders may find it insulting if a SOF operator is engaging with a mobile device rather than with the leader himself. Furthermore, with the variability in dialects in some regions, mobile devices may not provide the most accurate translation, causing miscommunications or creating an insult. Thus, the use of performance support tools *during* the task/mission should be carefully considered; it may not be appropriate or recommended in all contexts.

Conditions of Learning

The other factor that influences the potential role and appropriateness of MLT use throughout a SOF operator’s language learning career is the learning condition (i.e., the situation in which people require instruction or assistance). Mosher and Gottfredson (2010) identify Five Moments of Learning Need encountered in the learning and performance lifecycle ([Figure 4](#), p. 28). These moments of learning need illustrate the different purposes that a learning event may serve. By understanding the learning context of each moment of need, we can begin to identify where mobile learning may be an appropriate learning strategy.

The first two moments of need (new and more) occur during the knowledge acquisition phase of the learning and performance lifecycle and are typically addressed through formal, structured learning (i.e., IAT, SET, and PMT) because the individual is either learning skills and knowledge for the first time or learning more (Malamed, 2013; Mosher & Gottfredson, 2010). The remaining three moments of need are encountered during the knowledge application phase (i.e., during a mission, within the operational environment) and “typically benefit from performance support, including just-in-time learning, micro-instruction, conversation, and other informal learning approaches” (Malamed, 2013, p. 1). When trying to remember or apply knowledge, when things change, or when something goes wrong, learners need performance support, or context-based learning, for successful knowledge application (Ford, n.d.). Mobile learning, by its very nature, is context-specific and situated, thus the potential role of MLT is greatest as a means of delivering performance support. However, this does not mean that MLT cannot be used in a formal learning environment. The content in language training can be very general (e.g., not context-specific), but the same language functions (e.g., giving commands) can be applied in various context-specific situations with few changes in vocabulary. In a formal learning environment, MLT would be useful in a blended learning approach.

Malamed (2013) discussed each of the five moments of need and suggested possible corresponding instructional approaches ([Table 6](#), p. 28). While these are only possible approaches and not an exhaustive list, during the first two moments of need (typically reached with formal instruction), Malamed (2013) suggested a blended learning approach. In a blended learning approach, mobile learning could be used to support formal classroom instruction by assigning students homework to complete on their own using MLT. Furthermore, during the second moment of need (i.e., when wanting to learn more), Malamed (2013) specifically listed mobile learning as a potential approach to meeting this need.

As discussed above, MLT can be a great means for delivering performance support and Malamed (2013) further supported this. [Table 6](#) (p. 28) provides mobile performance support as a possible learning approach to meet all three of the application of knowledge moments of need. In addition to performance support, other informal learning approaches can also meet the application of knowledge moments of need. For instance, when something goes wrong, Malamed (2013) indicated that a possible learning approach is to use forums or microblogging (e.g., Twitter). Both of these potential learning approaches can be accomplished through the use of MLT, such as iPhones or iPads.

MLT can be applied in different types and conditions of learning. This is particularly important in the SOF context because it allows for flexibility of use (e.g., a tool supporting formal SET or a performance support tool while downrange). The next section of this report provides specific recommendations as to how MLT can be incorporated into the SOF language learning context.

Figure 4. The Five Moments of Learning Need

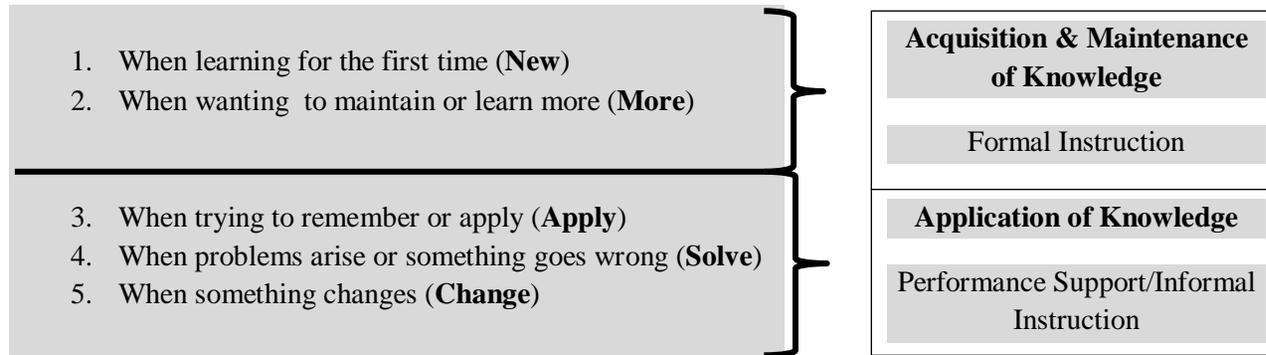


Table 6. Moment of Need and Learning Approach

Moment of Need	Possible Learning Approach
When learning for the first time	eLearning, blended learning, virtual classroom, self-study
When wanting to maintain/learn more	eLearning, blended learning, virtual classroom, self-study, mobile learning
When trying to remember or apply	Performance support (online or offline), manual, mobile performance support
When problems arise or something goes wrong	Help Desk, FAQ, mobile performance support, forums, microblogging (Twitter, Yammer), wikis, IM
When something changes	Performance support (online or offline), documentation (pdf, Word), mobile performance support, microblogging (Twitter, Yammer), wikis, IM

Source: Malamed (2013) http://thelearningcoach.com/elearning_design/working-with-the-five-moments-of-need/

SECTION V: RECOMMENDATIONS FOR LEVERAGING MLT IN SOF LANGUAGE LEARNING CONTEXTS

The following recommendations for incorporating MLT into the SOF language learning context are based on the idea that as the formality of training decreases, the potential role of MLT increases. Across formal classroom environments, the opportunities to use MLT are similar, relative to the time available for training, regardless of the point within the SOF operators' language training trajectory (e.g., IAT, SET, PMT). For example, using a smartphone to practice vocabulary drills is a viable language learning activity SOF operators can engage in throughout the course of their careers. However, given the variability in training characteristics between SOF components as well as units, there is more opportunity for informal learning in some training contexts than others. For example, IAT is typically more institutional in nature and is characterized by lengthy multi-week sessions, organizationally-driven learning goals and objectives, and large amounts of instructor-student interaction⁶. Although IAT is a more formal learning approach, the use of MLT could still be effective in this environment as part of a blended learning solution, but it must be truly integrated for class activities, homework, and self-directed study. Mobile learning devices could be supplied to SOF operators to supplement their classroom instruction. Instructors could assign particular lessons to be completed as homework assignments via a mobile device, or SOF operators could use the device for informal individualized study or for class activities, but instructors would need training on integrating devices into the existing curriculum. Curriculum designers/developers would need to explicitly build MLT into future curricula and materials.

In the SOF environment, SET and PMT can be part of a formal or informal learning approach. In many cases, SOF components and units have formal (i.e., instructor-led classroom training) SET and PMT available. In these situations, MLT would be useful in a blended learning environment, as suggested in regards to formal IAT. In other instances, SET and PMT tend to be more variable in terms of instructor and resource (e.g., language lab, tutor, virtual training) availability, and in general, follow a less consistent path than IAT⁷. There is more variability in how, when, where, and how often a SOF operator engages in SET and PMT due to other training requirements, deployments, or demands on a SOF operator's time. SOF operators also engage in more informal SET in preparation for their annual proficiency tests (e.g., OPI). This preparation is not likely conducted in an instructor-led classroom environment, but as independent study on the SOF operator's own time.

In these contexts, there is more opportunity for MLT to play a larger role in the sustainment and maintenance of language skills. Providing SOF operators with a mobile device, such as a tablet, for independent SET or PMT allows SOF operators the flexibility to study on their own time and in any location. This would be invaluable on deployment. In this context, nearly all language learning is SOF operator-driven, as the SOF operator accesses the language content when and where the context demands it. This pervasive need for sustaining and maintaining language capability and the lack of formal training

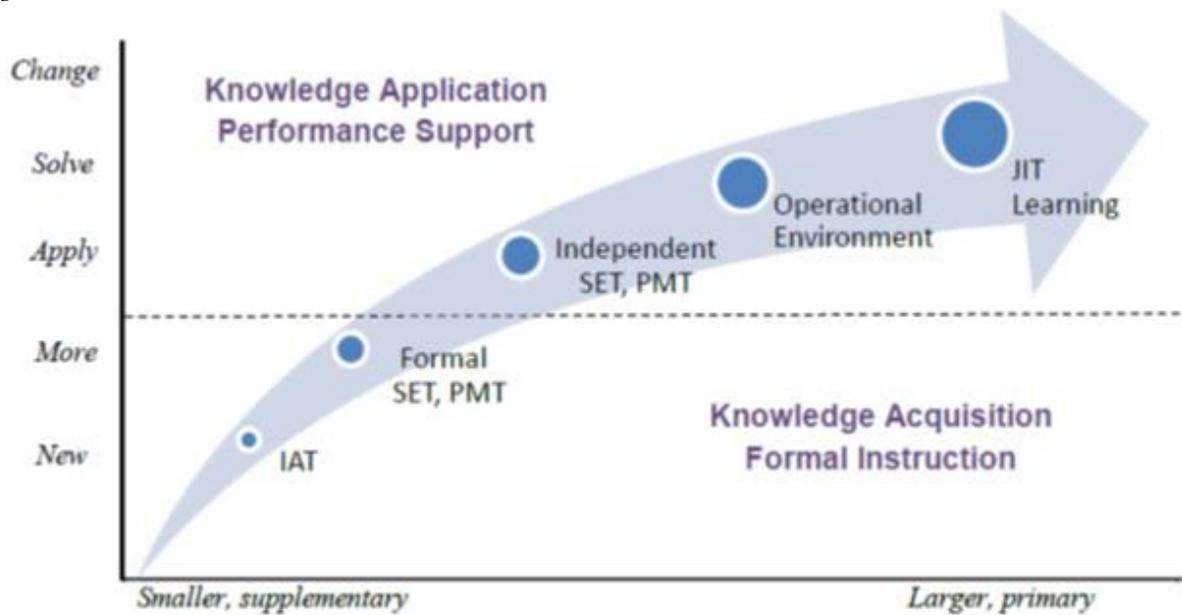
⁶ This is a very high-level, broad description of SOF IAT language training intended to describe very high-level characteristics of the context. We acknowledge there may be significant variability in training contexts across branches, components, units, etc.

⁷ This is a very high-level, broad description of SOF SET and PMT language training intended to describe very high-level characteristics of the context. We acknowledge there may be significant variability in training contexts across branches, components, units, etc.

and other resources (e.g., instructors, often times Internet connectivity) are what make the operational environment the most fertile ground for the incorporation of MLT.

Figure 5 (p. 30) depicts how each moment of need aligns with SOF language learning and performance contexts (i.e., IAT, SET, PMT, operational environment). As a SOF operator encounters each of the five moments of learning need, the learning context becomes more informal and the potential role of mobile learning increases.

Figure 5. The Role of MLT



Below are more specific recommendations organized by SOF language learning context. The recommendations that follow align with the concept of lifelong learning discussed in the ALC 2015 (U.S. Department of the Army, 2011), allowing SOF operators to access information across all learning contexts.

Recommendations for IAT

The focus of IAT is on providing a foundation of initial knowledge and teaching the basics of the target language. It is characterized by lengthy, multi-week learning sessions and large amounts of instructor interaction in a classroom environment. In many cases, IAT is institutionalized and therefore all SOF operators in the component/unit are required to attend training. It is focused on the first moment learning need (Figure 4, p. 28), when learning something for the first time. Therefore, the most effective role of MLT will be primarily as a support, supplement, or tool to augment traditional learning, which must be effectively blended into the course. While possible, it may be difficult to use mobile devices as a primary learning delivery mechanism for IAT due to training length, intensity and complexity of training content, and potential limitations of mobile devices. Therefore, we recommend that MLT be used as a support or augmentation of traditional classroom-based learning as part of a blended solution. MLT can be used for class activities, assigned homework, and self-directed learning outside of the classroom (e.g., personal study time). Mobile learning devices can also be used in socially constructed learning situations, such as

peer-to-peer activities. Since SOFTS is a virtual, synchronous classroom context, MLT could be especially useful in relations to SOFTS courses.

Examples of ways MLT could be used during IAT include: practicing vocabulary drills, watching movies/videos in the target language, listening to audio recordings in target language, recording the SOF operator speaking in the target language for review by the instructor, or for completing homework exercises and transmitting them to the instructor for review and feedback. Activities such as these can be used to supplement IAT through in-class activities, peer-to-peer activities, and self-directed learning activities outside of the classroom. Mobile devices can also be used as a measurement device to track students' progress (e.g., recording an oral presentation and submitting to the instructor for review). The following research studies provide specific examples of how MLT was used during language training and examined students' reactions to the use of such devices.

An example of a study investigating the use of MLT to supplement traditional language learning was done by Thornton and Houser (2005). They developed several innovative techniques using mobile phones to help teach students at a Japanese university. One focused on providing vocabulary instruction by Short Message Service (SMS). Three times a day, they emailed short mini-lessons to students, sent in discrete chunks so as to be easily readable on the small screens of the mobile phones. Lessons defined five words per week, recycled previous vocabulary, and used the words in various contexts, including episodic stories. Students were tested biweekly and compared to groups that received identical lessons via the Web and on paper. The results indicated that SMS students learned over twice the number of vocabulary words as the Web students, and SMS students improved their scores by nearly twice as much as students who received their lessons on paper. Students' attitudes were also measured and the vast majority preferred the SMS instruction, wished to continue such lessons, and believed it to be a valuable teaching method (Thornton & Houser, 2005). The authors theorized that their lessons had been effective because they were delivered as push media, which promotes frequent rehearsal and spaced study, and because they utilized recycled vocabulary (Thornton & Houser, 2005).

Another example of MLT being used to supplement traditional foreign language learning took place at Duke University in 2004. Duke University supplied iPods to each of its new undergraduates in 2004. Language learners were able to use these devices for listening and speaking activities and tutor-student/student-tutor communication (Belanger, 2005). In addition to accessing Spanish songs, learners could download and listen to audio information, access glossaries accompanying course textbooks, access narratives recorded by native speakers of the language, and access tutor feedback on students' work. In this case, learners also used the devices to record their oral assignments for assessment purposes. They then uploaded these to the assessment areas of their courses' virtual learning environment (VLE) so tutors could provide feedback (Belanger, 2005). The results of this study indicated that student engagement and interest in class discussions increased as a result of the iPods, and that location-independent access to digital course materials led to reduced dependence on lab or library locations.

Using MLT in this role during IAT would also help the user become familiar, comfortable, and confident with the device in a support-rich environment where there is assistance available should the SOF operator have difficulty using the device or be unfamiliar with using mobile devices in a learning context. Use of MLT during IAT also provides SOF operators with opportunities for developing efficiency with self-learning. Then, when in an environment where there is often less support available (e.g., on deployment),

the SOF operator will already have confidence and experience using the device for language and culture training. Additionally, allowing more autonomy to SOF operators in acquiring “knowledge by finding the most appropriate support resources for the language learning task may reduce the pressures on instructors to constantly update traditional instructional materials to meet the unique needs of learners with diverse experiences” (Tucker, 2010, p. 10). However, the language resources and content provided on a mobile learning device must be aligned with the course learning objectives and content. Alignment in IAT is very important because it ensures SOF operators are adequately prepared to meet the language-related requirements of their missions. The content and context of trained materials, whether formal or informal, should align with the capability needed to support mission performance, which can be captured with a thorough needs assessment (Surface, 2012).

Recommendations for SET & PMT

In the SOF community, SET can take place as formal or informal language training; however, the primary functions of both formal and informal SET are the same: (1) to help SOF operators maintain or enhance their target language proficiency acquired during IAT and (2) to prepare SOF operators for language proficiency testing (e.g., OPI), which could ultimately lead to foreign language proficiency bonus (FLPB), promotions, or participation in advanced training programs. The design of SET programs varies for each SOF component/unit. Some Command/Component Language Program Managers (CLPMs) have the freedom to manage their own Command Language Programs (CLPs), as long as 80% of their personnel in language billets meet or exceed the proficiency requirements set by the unit and/or USSOCOM. However, if a unit falls below the 80% standard, they must adhere to the SET requirements outlined in the SOF Language Program Manual (USSOCOM, 2009). These requirements indicate that the CLP must provide personnel with 150 hours of mandatory SET that must be completed in no less than three consecutive months. This suggests that during SET, there is variability as to *how* those skills are maintained, and SET does not follow as codified and consistent a path as IAT. This increased variability presents an opportunity for MLT to play a larger role as a supplement to formal SET.

The purpose of the learning and characteristics of the SET environment influence the potential role of MLT. The moment of learning need that describes the purpose of the learning in SET is “when wanting to maintain or learn more.” Formal SET in the SOF context is similar to IAT in that it is typically instructor-led, although SET occurs over a much shorter time period (e.g., 4 weeks) than IAT. In this context, MLT can be used to supplement the classroom, instructor-led training in a blended learning solution, but it must be integrated for class activities, homework, and self-directed study. However, if instructors use mobile devices for in-class activities or assign lessons to be completed as homework assignments, the instructors would need training on effectively integrating devices into existing curriculum. Curriculum designers/developers would also need to explicitly build the use of MLT into future curricula and language training materials.

MLT offers another advantage that is particularly valuable in the formal SET context: the ability to adapt to the individual learner’s needs. SOF operators participating in SET represent a more heterogeneous group of learners in terms of proficiency levels than SOF operators enrolled in IAT. In other words, most SOF operators have similar proficiency levels at the beginning of IAT (i.e., most have no proficiency), but SOF operators engaging in SET are more likely to have varied levels of language proficiency (e.g., ILR levels 0+ and 2 could be in the same class); therefore, they need varied levels of training. MLT has

the flexibility to adapt to the individual SOF operator's needs. Therefore, if formal SET is not giving the SOF operator what he needs, he can supplement his SET with mobile learning content. This would also be useful in preparation for annual testing. SOF operators could use MLT to study the areas where they need the most practice (i.e., creating an individualized training solution).

As has been pointed out by Laurillard (2007, p. 34), "a typical m-learning activity could build in more opportunities for digitally-facilitated site-specific activities, and for ownership and control over what the learners do." Different learners are going to have different needs and follow different paths in terms of their training maintenance needs. Some learners will need very little additional training to maintain their language skills, but others will require more intense practice and sustainment exercises to maintain their level of proficiency. MLT creates an opportunity for a SOF operator to customize his informal learning to target his own areas of need and improvement.

Therefore, when the SOF operator wants to go beyond the mandated formal SET and engage in language and culture learning on his own time for self-developmental purposes or in preparation for proficiency testing, MLT, with its high level of accessibility anytime, anywhere and the ability for the user to customize the learning to their individual needs, could be an attractive option. This can be thought of as informal SET, or language and cultural learning that takes place outside of the command-mandated formal SET. During this SOF operator-driven informal SET, the SOF operator makes decisions about format, frequency, duration, and timing of the learning instead of having those conditions dictated to him by the organization. It is in this SOF operator-driven SET context that the individual SOF operator has a significant opportunity to engage in the self-development learning domain described in the ALC 2015.

A specific example of using MLT for informal SET would be if a SOF operator, after completing IAT, realizes he is confident giving commands in the target language but has difficulty with the finer nuances of asking and answering questions. He can target his informal SET efforts on becoming more confident in the areas in which he needs to strengthen his skills. Additionally, if the MLT solution incorporates content, context, and conditions of asking and answering questions needed for the SOF operator's mission(s), as well as the general skill, then the SOF operator can create an individualized solution. Therefore, we recommend MLT be used as a supplemental tool during both formal and informal SET. Due to some of the limitations of MLT, such as small screen size, it may be difficult to use as a primary learning delivery mechanism, but it is well-suited for use as a practice, consolidation, and drilling tool. We feel that during formal SET, MLT can be applied in a more prominent supplementary role than IAT, but it is not recommended as the primary learning delivery mechanism. Possible ways MLT could be used during both formal and informal SET include practicing or learning new vocabulary and grammar, reading/watching/listening to material in the target language on the Internet, improving pronunciation skills and fluency of speech by accessing online audio files, and enhancing knowledge of target region culture by reading more detailed Internet articles or e-books on culture. Another example is using a mobile application, such as Skype™, on a tablet or smartphone to access a live instructor or other native speaker to practice speaking in the target language, receive feedback, or to ask questions about target language culture.

PMT is similar to SET in that the goal is to refresh and maintain the language skills acquired during IAT⁸. PMT is also similar to SET in that it can consist of both formal and informal learning. According to the USSOCOM Manual 350-8 (2009, p. 12), “All deploying SOF and SOF enablers shall receive pre-deployment language and culture training for the area into which they are deploying. This training shall consist of at least 40 contact hours⁹ of instruction.” This formal PMT is typically instructor-led, but the training is very brief and the content is often limited. The primary goal of this PMT is to prepare SOF operators for an impending deployment by enabling “SOF personnel to readily establish rapport with host nation, allies, and uncommitted civilians” (USSOCOM, 2009, p. 20). Broadly put, the purpose of this training in relation to the five moments of learning need is “when trying to maintain or learn more”. More specifically, the purpose is to prepare SOF operators to successfully execute the mission(s) they will be conducting during deployment by familiarizing them with the target language and culture they will need for the mission. The nature and requirements of these missions can vary significantly (e.g., training host nation counterparts, negotiating with tribal elders, direct action operations, etc.). As with IAT and formal SET, MLT can be used to supplement formal PMT in a blended learning approach through in-class activities, homework assignments, and personal study time.

Consistent with SET, there is variability in SOF operators’ background who are receiving formal PMT. Specifically, there is variability in the SOF operator’s level of proficiency coming in, whether the content is new (i.e., outside area of responsibility [AOR] deployment) or previously learned, and the extent to which alternate language learning resources (e.g., a tutor or language lab) are available. Similar to SET, variability in the content of learning and context characteristics can pose challenges for traditional classroom-based learning and can present opportunities for MLT to fill in some of the gaps that current PMT has difficulty filling. MLT can also be useful during informal PMT, or learning which occurs outside of the provided 40 contact hours. SOF operators may not feel that 40 hours of instruction is enough and want to conduct independent study on their own time, especially for SOF operators who are studying the deployment language for the first time. If SOF operators were provided with pre-loaded tablets or iPhones that contained language apps and programs in the deployment language, they could study on their own time.

Mobile learning cannot and should not replace PMT exercises, such as live Mission Rehearsal Exercise (MREs), formal and informal culture familiarization training with natives, or live training with language instructors. However, if a language instructor or software programs are not available at the PMT facility, live video/voice over IP applications (e.g., Skype™, Google Video Chat) could be used to virtually connect SOF operators with language learning assets not physically available to them during PMT. MLT could also help fill in the gaps during PMT by using mobile social media mechanisms to allow SOF operators to communicate with their peers who have deployment experience in a particular AOR to obtain

⁸ This is the case for many operators, though we acknowledge SOF operators may be deployed to areas outside of where their target language is spoken and in these cases, the language learned in PMT would be new to them and not a refresher on previously learned content.

⁹ SOF leadership may want to consider revising the 350-8 manual’s requirement of a minimum of 40 contact hours to clarify what are considered “contact hours” and if these only include time with a live instructor or if they also include time spent engaging in other modes of language training, such as using mobile learning technology.

up-to-date or even real-time information about the AOR into which the SOF operator is being deployed¹⁰. In sum, we recommend that MLT take a larger supplementary role during PMT than IAT, but that it not be used as a primary learning mechanism in PMT.

Recommendations for Performance Support in an Operational Context

The primary goal of mobile performance support is to provide very small and specific language-related pieces of content at the point of need in an operational context. Often it is not until people are actually performing or about to perform a task that they realize the specifics about what they do not know, either because they did not learn it, they misunderstood it, or they forgot it. By providing support very close to (i.e., prior to) or during the moment of performance, mobile performance support tools enable learners to excel in ways they cannot with formal training alone. Mobile technology puts users in a position to take the lead and engage in activities motivated by their personal needs and circumstances of use (Kukulska-Hulme, Traxler, & Pettit, 2007; Pettit & Kukulska-Hulme, 2007). In other words, users can apply the skills immediately, which decreases cognitive load since the user does not need to recall everything from memory alone before he performs a task (Rossett, 2010). This is especially relevant in a SOF operational context in which SOF operators are required to know and be able to apply a large amount of information from memory, from basic first aid, to weapons and vehicular knowledge, to strategic and tactical battlefield practices.

Language and cultural knowledge represent only a small part of the wealth of information for which a SOF operator is responsible. In a setting that is both mentally and physically stressful, such as an operational environment, performance support tools could lighten the cognitive load on SOF operators and help them be more confident and successful during operations. This context is the most ideally suited for the use of mobile devices as a primary learning delivery mechanism and most effectively leverages the advantages a mobile learning device has to offer, such as portability, instant accessibility, and the ability to deliver targeted chunks of information in an on-demand format at the point of need. The purpose of the learning that takes place in this context is also in alignment with the three moments of learning need that are best suited to be addressed with performance support devices offering on-demand support: (1) when trying to remember or apply, (2) when things change, and (3) when things go wrong.

Formal learning, such as IAT, SET, and PMT, coupled with performance support, would enable a SOF operator to access specific content at the point of need, supporting faster and more accurate knowledge application and resulting in greater speed to competency. Therefore, we recommend adopting a policy of developing mobile applications and content for use as performance support tools that SOF operators can use in operational contexts to help prepare them for successful execution of language-related mission tasks (i.e., just-in-time learning prior to the mission task). Providing ready access to “just-in-time learning” on a mobile device, while in remote areas, would bring the training source to SOF operators. This would allow SOF operators to have the resources available when they want it and when they need it, leveraging the capabilities and ubiquity of mobile technology to provide totally self-directed learning.

¹⁰ Data security, however, may become a concern when using publically available programs and services, and SOF may want to consider developing a secure social media outlet for the exchange of secure information.

Using Mobile Technology for Performance Support

As previously mentioned in [Section IV](#), in the SOF context, performance support tools should be considered in two ways: (1) tools that can be used immediately **prior** to the task/mission (i.e., JIT learning) or (2) tools that can be used **during** the task/mission (i.e., while performing). Performance support tools used for JIT learning can help SOF operators refresh their memories with vocabulary, phrases, etc. they learned during language training. Mobile learning devices, such as iPhones or tablets, could contain pre-loaded language software for SOF operators to study immediately prior to performing a task requiring their use of the target language. The use of performance support tools in this context allows SOF operators to learn the language skills needed “just-in-time” to be able to perform the language skills on their own (i.e., without the aid of a performance support tool). This is in contrast to using performance support tools while actually performing a task/mission.

Performance support tools can also be used during the task/mission. However, the use of performance support tools in this context should be carefully considered. In some circumstances, it may be detrimental for SOF operators to use a performance support tool (e.g., Phraselator, mobile phone) while performing the language-related mission tasks. For instance, outsourcing the language skills to a mobile device rather than speaking the language oneself may create communication barriers or be insulting in some host nation countries. On the other hand, performance support delivered through a mobile learning device within an operational context can have a more significant impact as a short-term memory aid than a typical performance support tool (e.g., pointy-talky cards).

In addition to users’ ability to quickly access large amounts of information, advantages of a mobile performance support tool over a traditional performance support tool (e.g., dictionaries, pointy-talky cards) include support for simultaneous multiple users, support anywhere and at any time (when the delivery technology is available), and personalized feedback and guidance (McManus & Rossett, 2006). A SOF operator can review the vocabulary, greetings, or other linguistic and/or cultural information needed for the tasks/duties they will be conducting during a mission in the very near future. For example, an SOF operator going into a negotiation with tribal elders during Ramadan could use his mobile device to review appropriate greetings, customs, and key vocabulary *prior* to the engagement so he is prepared for the negotiation but does not need to use the device *during* the engagement. SOF operators have indicated during previous studies (SWA Consulting Inc., 2004; SWA Consulting Inc., 2010b) that performance support tools, such as the Phraselator, are cumbersome to travel with when carrying other required military gear, can cause miscommunications, and can be detrimental in building rapport in some host nation cultures. This is a prime example of why using performance support tools during the mission should be considered on a case-by-case basis.

Another example would be a SOF operator who is being assigned to man a checkpoint. He could review the specific vocabulary and cultural customs associated with the particular task he will be executing (e.g., how do you ask a local female for identification or to submit to a search?). In these language-related situations, mobile devices could be used as a type of “external hard drive” to extend the SOF operator’s memory. The mobile device could augment past training to help him have the language and cultural information he needs in a just-in-time format (i.e., prior to performing) to help him prepare to successfully execute his mission. It is important to consider the context and situation during which a performance support tool is being used. For instance, in the previous example when manning a

checkpoint, it may be acceptable for the SOF operator to use a tool to translate on the spot if he does not have the language skills and does not have access to an interpreter. However, it would likely be inappropriate for him to use a performance support tool during a KLE where a large part of the task is building rapport and engaging the person with whom he is speaking.

MLT: A Step towards Lifelong Learning

As previously discussed, informal learning happens throughout the course of a SOF operator's professional career and spans the entire training and deployment cycle. Lifelong learning, a type of informal learning and one of the most important 21st century Soldier competencies, is the "...individual lifelong choice to actively and overtly pursue knowledge, the comprehension of ideas, and the expansion of depth in any area to progress beyond a known state of development and competency" (U.S. Department of the Army, 2011, p. 67). Specifically, the ALC 2015 (U.S. Department of the Army, 2011) states that "Soldiers must become expert, self-motivated learners who are capable of asking good questions and possess digital literacy skills that enable them to find, evaluate, and employ online knowledge, whether in learning or operational environments" (p. 14). This vision of active, agile-minded, dynamically adaptable SOF operators is achievable by adopting an orientation towards lifelong learning. Further, the emphasis on digital literacy skills within the context of lifelong learning illustrates the usefulness that MLT could have for a SOF operator over the course of his career. MLT allows SOF operators to access information across all learning contexts, from IAT to PMT, inside and outside of formal learning contexts, allowing them to increase their knowledge base on their own schedule and continue improving their language skills. For example, the previously discussed mobile social media applications may allow SOF operators to share information in real-time after training has ended, as opposed to only in a formal learning environment during specified hours.

Conclusions

Mobile learning can be useful, assisting in both learning new information and maintaining or enhancing a current knowledge base, but only if applied in a context-appropriate manner. MLT can be useful in a formal language learning environment as a blended learning solution. Instructor-led, classroom learning can be supplemented with the use of mobile devices for in-class activities, assigned homework, or independent study outside of the classroom, on the SOF operator's own time. However, it is important to consider the integration of MLT into existing curricula and the need for training instructors on how to use the mobile devices. MLT could also play a role in informal language learning. MLT could help SOF operators reach the goal of becoming lifelong learners by giving them access to content that is relevant and adaptable to their changing training needs as they are occurring. Specifically, MLT could allow SOF operators to create an individualized learning solution to enable learning at a level appropriate to their needs and contexts (e.g., test preparation, deployment).

As previously discussed, equipping SOF operators with MLT may help them personally manage their learning in different contexts throughout the course of their careers (Sharples, 2000). There are many ways in which MLT can foster the lifelong learning of SOF operators. For example, the Army Marketplace (<http://www.army.mil/mobile/>), an online application store, features applications covering information from workout guides to Army task manuals (Ackerman, 2011). This online marketplace could provide SOF operators with various language learning and performance support applications for use

across language learning contexts, allowing them to continue increasing their knowledge base throughout their careers.

It is important to emphasize that the role of MLT will differ depending on the language learning context (e.g., IAT), the purpose of learning (i.e., five moments of learning need), and the specific skill needs of each SOF operator. There is no sufficient evidence to suggest the use of MLT could effectively replace more traditional classroom or live environment training (LET)/immersion modes of instruction for formal training purposes. In a formal learning context, MLT has the greatest opportunity to make an effective contribution in a supplementary or augmentative role to traditional learning (i.e., blended learning)¹¹. It is important to consider learning context, whether it be formal or informal, to ensure that MLT is applied in an effective, appropriate manner. When applied appropriately, formal and informal learning can complement each other to create a solid foundation of learning. Like the Bell (1977) analogy discussed earlier, formal learning acts as bricks fused into the emerging bridge of skill and knowledge development and informal learning acts as the mortar, facilitating the acceptance and development of the formal learning and filling in any learning gaps between the formal training “bricks.”

Future Directions

The recommendations provided in this report focus on providing very broad, high-level suggestions as to how MLT could be effectively incorporated into SOF language training. The next step is to tighten the scope of these recommendations to focus on how and when to use MLT at the specific task level.

[Appendix C](#) presents SOF leadership with a more granular decision-making framework that evaluates the feasibility of replacing traditional, live instruction with virtual, technology-based training for SOF language instruction at the specific task level.

This decision-making framework was developed in a study sponsored by the Office of the Under Secretary of Defense (Personnel & Readiness), which charged researchers with the task of developing a decision algorithm to determine whether a military task is best taught virtually or live by evaluating the task in terms of four key factors: (1) domain, (2) level of interaction/fidelity, (3) task complexity, and (4) feedback availability/synchronicity (Curnow, Paddock, Wisher, DiGiovanni, & Rosengrant, 2012). We believe this framework could be adapted and further developed to focus on and provide recommendations as to the suitability of specific tasks for training using MLT. [Appendix C](#) lays out the basic decision-making framework and provides several language learning task examples. However, this work is in its preliminary stages and is in need of further research and development.

¹¹ See [Appendix C](#) for a task-based decision-making framework that can aid in determining whether technology-based instruction can replace traditional instruction.

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ABOUT SWA CONSULTING INC.

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- Performance measurement and management
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- Test development and validation
- Program/training evaluation
- Work/job analysis
- Needs assessment
- Selection system design
- Study and analysis related to human capital issues
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One specific practice area is analytics, research, and consulting on foreign language and culture in work contexts. In this area, SWA has conducted numerous projects, including language assessment validation and psychometric research; evaluations of language training, training tools, and job aids; language and culture focused needs assessments and job analysis; and advanced analysis of language research data.

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For more information about SWA, our projects, and our capabilities, please visit our website (www.swa-consulting.com) or contact Dr. Eric A. Surface (esurface@swa-consulting.com) or Dr. Stephen J. Ward (sward@swa-consulting.com).

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APPENDIX A: MOBILE LEARNING TECHNOLOGY BACKGROUND

This appendix presents information about: 1) The differences between mobile learning (mLearning) and eLearning, and 2) provides an explanation of which electronic devices are considered mobile and which ones are not.

1. Key Differences Between Mobile Learning (mLearning) and eLearning

Compared to mobile learning (i.e., mLearning), eLearning (e.g., SOFTS) is a more formal and structured type of learning. Most eLearning takes place on wired devices, such as laptops and desktops. In this sense, the eLearner is connected or “tethered” to something. Depending on the amount of material to be covered in the module, the duration of eLearning sessions can range anywhere from 20 minutes to several hours. Given the tethered nature of eLearning, the amount of material learners must progress through, and the amount of time it takes to do so, eLearning typically occurs at a specific time and location. The information learned during each eLearning session will be applied at a later time; therefore, comprehension and retention are key, as the focus is on preparing the learner so that he can recall information the moment it is needed (Feser, 2010).

Alternatively, mobile learning is often used as an informal type of learning. It is untethered (i.e., wireless), often self-paced, opportunistic, and at the learner’s discretion, enabling the mobility of the learner and the learning itself across space and time. Given this ubiquitous characteristic, mobile learning enables the learner to access information at the moment it is needed. As such, “successful mLearning [mobile learning] is more about easy and convenient access to information and less about committing information to memory,” although it can be useful for both (Feser, 2010, p. 1).

2. Which Devices are “Mobile” and Which are Not?

There is much debate over which devices (hardware) are considered mobile and which are not. Most seem to agree that desktop computers/PCs do not fall in to the mobile category due to their large size, considerable weight, and dependence on a wired connection to access the Internet (Hanson, 2011). Similarly, most agree devices that can be held and operated with one hand, such as smartphones and Personal Digital Assistants (PDAs), do fall into the category of a mobile device. However, when it comes to devices such as laptop computers that fall somewhat in the middle, there is significantly more debate. Some believe that laptops are not generally considered to be mobile devices, as they are not small enough to hold in one's hand (Brown, 2010). Others argue that laptops are light enough to take with you and are not dependent on a wired Internet connection (Hanson, 2011). We believe it is important to understand some of the fundamental differences between how different devices are used and perceived by the user before making a judgment as to what is considered mobile and what is not.

What makes mobile devices different from non-mobile devices?

Quinn (2013) described the difference between mobile and non-mobile devices in terms of immediacy and intimacy. Immediacy is how quickly one can access the information for which he or she is looking (Quinn, 2013). For example, if you want to find out forecasted temperature for the day, do you have to power up your machine, open a browser, search for “weather report,” and select the appropriate page, or do you need to touch the weather application? Mobile users have become accustomed to expecting to

have the right application at the right time. Because they are often not at their home or office, they may need to use a mobile application immediately to find a price, transfer funds, or update their status. Immediacy also has a location-related component. How often is the device in your immediate vicinity? How easy is it to carry on your person to be able to access when you are on the move? Is the device accessible when you are walking down the street, shopping at the mall, or riding on a bus?

Intimacy, in the context of mobile devices, describes the nature of the relationship between the device and its user (Quinn, 2013). In other words, how personalized is the device to the user? How customized is the interface/homescreen, content, and general look and feel of the content to the individual user? Do you share the device with anyone else? Are there any identifying markings or coverings/cases on the device that were chosen/personalized by the user? When using the device how far away from it is your face? These concepts of immediacy and intimacy and their associated questions can help to determine if a device is considered mobile or not for a particular user.

According to Brown's (2010) definition of MLT, laptops (and larger machines) are not considered mobile devices; however, it may be more useful to think about device mobility as a continuum, where some devices are more mobile than others. Figure A1 (p. 46), adapted from Traxler (2005), illustrates what this continuum might look like, and characterizes the laptop computer as "luggable," which seems a more accurate description than either mobile or static. Different users have different usage patterns and levels of intimacy and immediacy, and mobility may mean something different depending on the needs and context of the individual. In this way, mobility may be in the eye of the beholder.

Figure A1. What Devices are Considered Mobile?*



*Adapted from Traxler, 2005

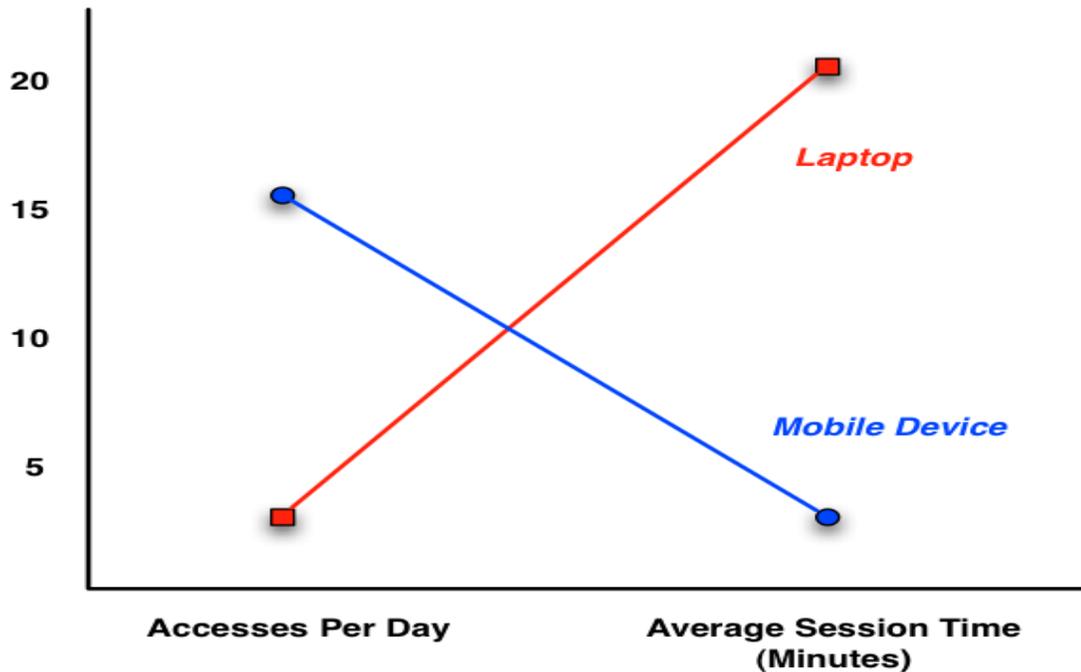
What Are the Usage Patterns of Different Devices?

Usage patterns also differ fundamentally between handheld devices (e.g., smart phones) and laptops or PCs. People tend to sit down at a desktop or laptop PC for a few long sessions, using the keyboard, large screen, and hard drive to create and edit large amounts of information (Quinn, 2013). For example, a user opens a word processor or spreadsheet and works for half an hour.

Handheld devices, however, are typically used more frequently throughout the day but also more briefly. People generally use handheld devices in frequent, short bursts—more like a watch than a PC. They take

a handheld device out of their pocket or briefcase to review and update small chunks of information. For example, they look up a phone number or quickly check their schedule. Falaki et al. (2010) found smartphone users typically interacted with their devices anywhere from 10 seconds to four minutes for a given discrete use session. Similarly, according to data from PalmSource, Inc. User Surveys (PalmSource, Inc., 2003), the usage patterns of handheld devices are nearly exactly the opposite of those of laptop computers (Figure A2, p. 47).

Figure A2. Usage Patterns of Laptops and Mobile Devices (Quinn, 2013)



Source: Palm, Inc. user surveys

As shown in Figure A2 (p. 47), different devices can have very different usage patterns. As such, for a mobile learning program to be effective, the program design must take the typical usage pattern of the device into consideration and design accordingly. For example, a learning event designed to be several continuous hours long is less likely to be effective if delivered via mobile device than if delivered on a laptop or desktop because of the typical usage pattern associated with the device.

APPENDIX B: TECHNICAL CONSIDERATIONS WHEN EVALUATING THE POSSIBILITY OF INCORPORATING MLT INTO LANGUAGE TRAINING¹²

There is an implicit tradeoff to be made with application when determining size of the hardware, between look-and-feel/usability and portability. Different types of hardware are going to be advantageous in different learning contexts. The larger format of a tablet (typically a ~10-inch screen) provides much more screen real estate to deliver a better user experience than a phone screen. The graphics can be more detailed and easy to read, the buttons and other touch screen interaction mechanisms larger and more user-friendly, and more information can be displayed on a single screen. This may be an attractive option for a SOF operator interested in accessing language training where there is no language lab available, at home, or any place in between, such as on a bus or in a coffee shop. On the other hand, a smartphone offers far greater portability than a tablet. A smartphone is compact enough to easily fit in a pocket and be held and used in one hand. A tablet, on the other hand, cannot be carried in an average-sized pocket. It either needs to be carried, demanding the sole use of a single hand, or placed in some type of carrying equipment like a bag or a case. Tablets also need at least two hands to use.

In the military world, equipment size and weight are very important. Under operational conditions, today's Warfighter carries a lot of equipment. It may be difficult to find any available real estate on a SOF operator's body for the size (and weight) of a tablet. Two-handed use can also be difficult with all of the other equipment SOF operators are responsible for carrying. On the other hand, a smartphone (or smaller tablet) can be extremely portable, especially when using a mounting device, making a smartphone an attractive choice. New technologies and hardware offerings, such as the 7.9 inch iPad Mini, may help to fill in the gaps between other devices and offer SOF operators even more hardware options to address their language training needs. In sum, it is important to consider the context in which the learning will be taking place (e.g., in an operational environment, on base in buildings without language labs) and the nature of the learning itself (e.g., brief refresher courses or lengthy foundational material) when evaluating the most effective type of hardware to use in a particular situation.

Another important device characteristic is available memory/hard drive space. Applications that are very media-rich, graphically heavy, and complex will require more available processing power and hard drive space on the device. For example, laptops typically have more robust processing capability and more available hard drive space than smartphones, so when designing a learning application for use on a mobile device, best practices dictate that designing complex programs/applications for smartphones is not an effective strategy due to the processing and memory constraints of that device.

An important design consideration when evaluating the incorporation of MLT into a language training program is the characteristics and capabilities of the device on which the learners will be accessing the language training content. One important device characteristic to take into account is screen size. Different learning applications and tasks are better suited for devices of different screen sizes. For example, laptops have larger screens, which place less stress on the eye than the smaller, mobile device screens; therefore, sustained reading (e.g., reading newspapers in the target language) is most appropriately done on a laptop rather than on a mobile device. Alternatively, short vocabulary drills are quick and can easily be performed on smaller screens, thus mobile devices are a viable delivery option.

¹² Hardware, software/application development, and data plan costs are also crucial considerations to make but are beyond the scope of the current report.

Previous research has found that there is a negative relationship between device screen size and user visual fatigue over time (Wu, Lee, & Lin, 2007). In other words, as screen size decreases, learner visual fatigue increases and this negative relationship strengthens as time goes on. Therefore, the optimal length of a discrete learning session is related to the relative screen size of the device due to the effects of the visual fatigue induced by the size of the device's screen. To put this into a language learning context, learning tasks that are fairly short in duration (e.g., a brief vocabulary drill) would be more feasible to complete on a smartphone (a device with a relatively small screen). However, a three-hour course on the various verb tenses and their applications in the target language would be very difficult to complete on a smartphone due to user fatigue and eye strain caused by the small screen.

Connectivity of the device is another device characteristic that needs to be considered. Connectivity is the ability of the device to access the Internet. In the context of mobile devices, connectivity is most commonly found in the form of a type of mobile broadband connection (e.g., 3G, 4G, LTE) or a wireless or "Wi-Fi" connection. A device with a mobile broadband connection is not required to be within range of a wireless router and can access the Internet from anywhere the carrier (e.g. AT&T, Sprint, T-Mobile) has mobile broadband coverage. Wi-Fi is a popular technology that allows an electronic device to exchange data wirelessly (using radio waves) over a computer network, including high-speed Internet connections. A device enabled with Wi-Fi can wirelessly connect to the Internet when it is within range of a wireless router that is hardwired to the Web. Smartphones typically have a mobile broadband connection of some sort, while tablets give the user the option of a Wi-Fi connectivity or mobile broadband coverage. The advantage of mobile broadband is increased mobility due to the lack of dependence on a wireless router, but the disadvantage is that a mobile broadband connection typically requires the user to purchase a data plan for the device. Wi-Fi, while it does virtually tether the user to the range of the wireless router, does not require the user to purchase an individual data plan.

This issue of mobile broadband versus only Wi-Fi-enabled devices may be an important issue for SOF leadership to consider when designing a strategy to incorporate the use of mobile devices in SOF language training. If SOF adopts a "bring your own device," or BYOD, strategy in which the SOF operator uses his own personal device to access language training content as part of his job, the question of who will be responsible for the costs associated with the data plan (if one is required for the training) comes into play. On the other hand, if mobile devices are issued to SOF operators, SOF leadership would need to decide if they would also purchase the data plan necessary to enable SOF operators to utilize the device's Internet capabilities outside of the range of wireless routers. If a mobile broadband data plan is not purchased for the device and the Internet connectivity abilities of the device are limited to the range of wireless routers, the ability of the SOF operator to access the training from virtually anywhere at any time may not be feasible. It is also important to note that while mobile broadband coverage is nearly ubiquitous in the United States and in many modern, heavily populated areas abroad, it is less available in more remote and sparsely populated areas, such as the mountains in Afghanistan.

When designing and programming a language learning application, regardless of the hardware type (e.g., tablet, smartphone) and operating system (e.g., Android, iOS) the device is using, SOF leadership must consider the pros and cons of the two primary ways applications can be designed and programmed: (1) native applications and (2) applications using HTML5. Native applications are designed and programmed to run on a specific operating system (typically iOS or Android). Because they are custom designed for a singular device type and platform, they have the ability to display much richer, more complex content that

results in an improved end user experience “look and feel.” Native applications also are able to access and use the device’s peripheral features (e.g., microphone, camera, GeoLocator) in the content and functionality of the application. HTML5 is considered the fifth iteration, or version, of Hypertext Markup Language (HTML) and is used for structuring and presenting content for the World Wide Web and is a core technology of the Internet. It aims to improve the language with support for the latest multimedia advances, while keeping it easily readable by humans and consistently understood by computers and devices (web browsers, mobile devices, etc.). HTML5 builds on the previous coding standards with the addition of certain improvements.

One of the improvements most relevant to SOF that HTML5 has over its previous versions is the feature of responsive web design. Responsive web design allows the programmer to only write the code for the application once. Prior to HTML5, if an organization wanted to have an application that would run on multiple devices (smartphone, tablet) and multiple OS (iOS, Android), it was necessary to write a separate program for each device and OS to have a fully functional and smoothly running application on each one. With HTML5, the programmer only needs to write the application code in HTML5 and choose to publish it to the various devices and operating systems, saving a lot of time and money (De Graeve, 2011). This makes it more easily and cost-effective to update because instead of writing and installing updates for each version of the app (for each device and OS), you only need to update the HTML5 code and deploy it to all versions automatically. This flexibility, however, does not come without a cost. As shown Table B1 (p. 50), there are pros and cons to apps written in each way and when selecting a design strategy for mobile language learning applications, SOF leadership should consider each of these tradeoffs and determine which elements are most important within the larger mobile learning strategy.

Table B1. Design Characteristics of Applications Written in HTML5 vs. Native Apps

Design Characteristic	Updatability & Transportability	Capability	User Experience	Cost & Time to program
Native App	Low	Robust, complex	Rich	High
HTML5	High	Utilitarian, simple	Austere	Low (in comparison)

APPENDIX C: A TASK-BASED DECISION MAKING FRAMEWORK TO AID IN DETERMINING WHEN TO USE MLT

To complement the broad recommendations concerning the incorporation of MLT into SOF language training made in the main body of the report, this appendix presents SOF leadership with a more granular decision-making framework that evaluates the feasibility of replacing traditional, live instruction with virtual, technology-based training for SOF language instruction at the specific task level.

There are many different tasks that fall under the language learning umbrella, with some lending themselves better to virtual learning than others. In a study sponsored by the Office of the Under Secretary of Defense (Personnel & Readiness), researchers worked to develop a decision algorithm to determine whether a military task is best taught virtually or live by evaluating the task in terms of four key factors: (1) domain, (2) level of interaction/fidelity, (3) task complexity, and (4) feedback availability/synchronicity (Curnow et al., 2012). Pre-existing task taxonomies and categorization schemes (e.g., Bloom's Taxonomy, Cognitive Task Analysis) were examined from a technical perspective to identify factors and criteria capable of differentiating tasks solely on the basis of whether they can be trained through a virtual instructional method. Thinking about how a specific task rates on these four factors can help SOF leadership make decisions about which language training tasks may be suitable for the use of mobile technology and which tasks might be more suitable for blended learning or traditional schoolhouse training methods.

As identified by Curnow et al. (2012), each of the four factors is presented below along with the categories for each domain that are to be used in the decision making framework.

- **Domain**
 1. Procedural—routine step-by-step, limited cognitive complexity or psychomotor activity
 2. Cognitive—knowledge and development of intellectual skills
 3. Psychomotor—involving physical movement, motor skills, or perceptual and physical coordination
 4. Affective—involving emotions, motivation, and attitudes
- **Interaction/Fidelity Scale**
 1. One-way interaction with data or things, low fidelity requirements
 2. Two-way interaction with data or things, moderate fidelity requirements
 3. Two-way interaction with people, moderate fidelity requirements
 4. Two-way interaction, high fidelity requirements
- **Learning Complexity (Based on Bloom's [1959] taxonomy)**
 1. Not complex
 2. Complex at times, usually not complex
 3. Moderately complex
 4. Varying between moderately complex and high complexity
 5. Consistently highly complex
- **Inherent Feedback Availability**
 1. Built in/synchronous

2. Sometimes available/Sometimes delayed
3. Never available or very delayed

When using this framework to aid in the decision of whether or not a particular task is a good candidate for virtual training, a rating is assigned to the task in each of the four categories (Domain, Interaction/Fidelity, Learning Complexity, and Inherent Feedback Availability). Curnow et al. (2012) presented the following example of classifying the military task of marksmanship (Table C1, p. 52):

Table C1. Classification of Marksmanship

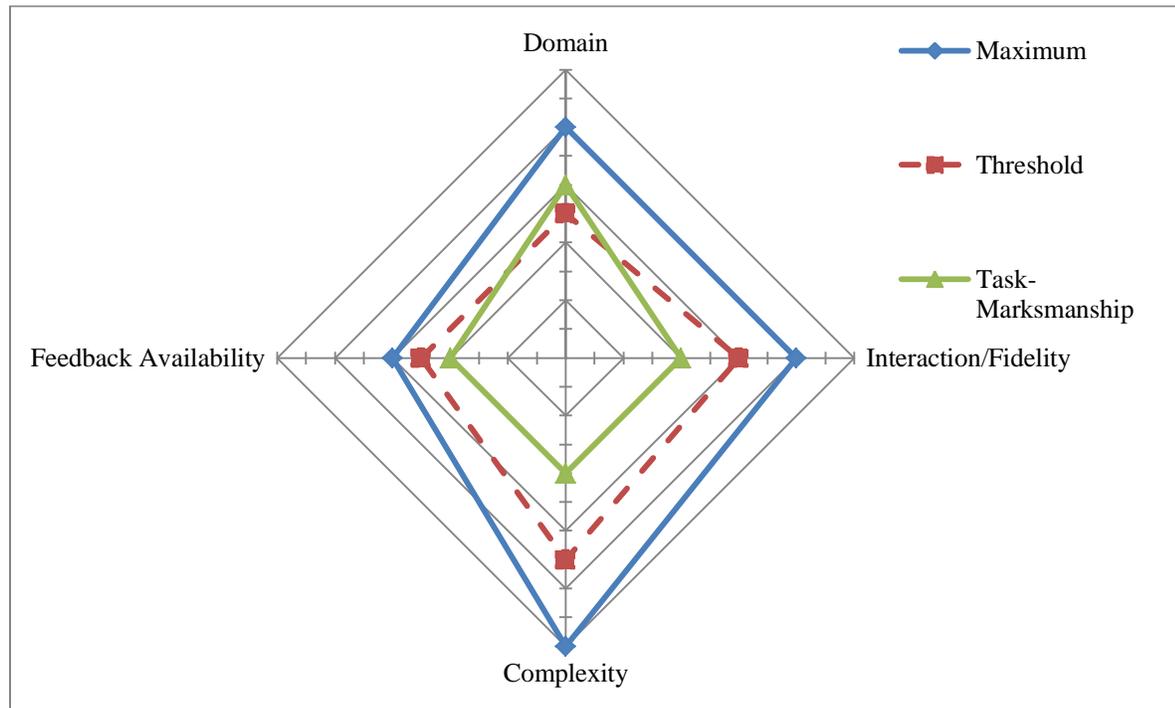
Category	Rating	Justification for Rating
Domain	3	Is psychomotor skill
Interaction/Fidelity	2	Requires interacting with a weapon
Learning Complexity	2	Is considered occasionally complex
Inherent Feedback Availability	2	Has built-in certainty about whether or not it has been done correctly

Therefore, this task would be designated as a 3.2.2.1 “tuple” (Curnow et al., 2012, pp. 4-5). To use this rating to determine if a task is better suited for live or virtual training, cutoff scores were created. In general, tasks that rated lower on each factor are better candidates for virtual instruction, such as via MLT, with limited to no formal instruction necessary, and those that rate high on each factor are better candidates for traditional, face-to-face classroom training. More specifically, the cutoffs suggested by Curnow et al. (2012, p. 8) are as follows:

- If Domain is 2.5 or greater, Interaction/Fidelity is greater than 3, Learning Complexity is greater than 3.5, and Task Certainty is greater than 2.5, then the recommendation is for live training.
- If Domain is 2.4 or less, Interaction/Fidelity is 3 or less, Learning Complexity is 3.5 or less, and Task Certainty is 2.5 or less, then the recommendation is for virtual training.

To make this framework more visual and user-friendly, an Excel spreadsheet has been created that will generate a graphic of the task based on the ratings assigned to each of the four categories and the cutoffs described above. This graphic visually illustrates whether a task is a good candidate for virtual training or if it might be better for more traditional training. If a task falls inside the threshold line, it is a good candidate for virtual training, however, if the task falls mostly outside of the threshold (pre-determined by the cutoff scores), then the task may be better suited for traditional training (Curnow et al., 2012). [Figure C1](#) (p. 53) is a graphic of Curnow et al.’s (2012) marksmanship example. The task falls primarily within the threshold and therefore would be a good candidate for virtual training.

Figure C1. Marksmanship Radar Graphic



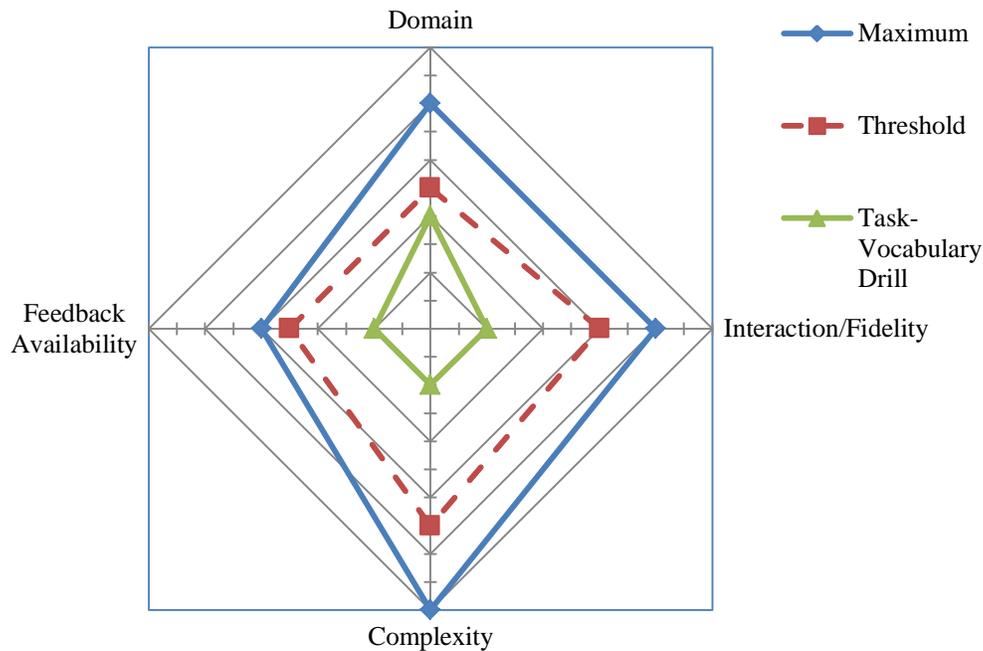
Several examples of how language learning tasks could be classified using the framework are presented below. It is recommended that these ratings be assigned by experts who are familiar with the language and culture task requirements associated with the job tasks being trained. Table C2 (p. 53) is a screenshot of how the foreign language vocabulary drill task graphed above (i.e., marksmanship) would appear in the spreadsheet. To categorize a task using this spreadsheet, a score for each of the four factors is determined by the user and then placed in the appropriate cell in Column D. The maximum values in Column B and the threshold values in Column C are pre-set based on the categories and cutoffs given by Curnow et al. (2012). The only values that need to be entered by the user are the actual ratings of the task on each of the four categories in Column D.

Table C2. Decision Framework Spreadsheet Screenshot

	A	B	C	D
1		Maximum	Threshold	Task- Vocabulary Drill
2	Domain	4	2.5	2
3	Interaction/Fidelity	4	3	1
4	Complexity	5	3.5	1
5	Feedback Availability	3	2.5	1

As [Figure C2](#) (p. 54) illustrates, the vocabulary drill task graphed above falls completely *inside* the threshold line, and therefore would be a good candidate to use a technology-based method of delivery.

Figure C2. Vocabulary Drill Radar Graphic



As previously suggested, in general, if a task rates lower on each of the four factors, training through virtual means (including the possibility of MLT) may be favorable because there is less of a need for formal instruction. Tasks rating high on each factor, in general, may be better trained using traditional, face-to-face schoolhouse training, but there are “gray areas” (Curnow et al., 2012) in which it is unclear if a task is a good candidate for virtual training because the task shape is similarly inside and outside of the threshold lines. According Curnow et al. (2012), the initial model does not account for blended learning; however, there may be tasks where a blended learning approach may be the best method of training delivery. In these cases, using MLT or other virtual learning mechanisms as a supplement to traditional learning may be the most effective approach.

This decision-making framework is presented to give SOF leadership an alternate, more granular way to think about and evaluate the incorporation of MLT into language training. It is intended to serve as a complement to the broad recommendations provided in the main body of the report.

This framework could be utilized to make practical, actionable recommendations to SOF leadership regarding the appropriateness of virtual/mobile training on a SOF-specific set of tasks. A group of subject matter experts (SMEs) could be orientated to this decision making framework and help to make any adjustments to make it more appropriate to evaluate language learning-related tasks. Then, using the task list generated from previous SOF needs assessment projects, the SME group could evaluate the tasks and produce a document that would provide SOF leadership with a summary of which tasks included on the list are most well-suited for virtual training and which are more appropriate for traditional training.