

We are pleased to attach the executive summary of the final report for the *Measurement of Effectiveness Study: Tactical Iraqi* published in May 2007 by the Special Operations Forces Language Office of the United States Special Operations Command (USSOCOM).

We thank both USSOCOM for commissioning this study to assess the efficacy of our Tactical Iraqi™ Language & Culture Training System, and the research firm of Surface, Ward and Associates for their thorough evaluation and thoughtful analysis.

We are heartened by the findings that the Tactical Iraqi course is an effective learning tool, and we concur with most of the recommendations for improvement.

The study was conducted with the release of the course that went into field use in September 2006. Since then and with support from the United States Marine Corps' Training and Education Command (TECOM) and Systems Command (MARCORSYSCOM/PMTRASYS), we have improved the course very much in line with this study's suggestions.

In August 2007, we will release a new version of the course. We estimate that it will significantly increase learning efficacy compared to the version used in this study.

A significant improvement is the extension of the course's mission-oriented vocabulary and scenarios to deal with missions of immediate importance such as crowd control, information gathering, and partner military training. We anticipate that this will have a particularly significant effect on the Mission Game, which is primarily a civil affairs mission in the version used in this study. We have also extended coverage of cultural awareness material, so we expect to see improvements there as well.

One of this study's conclusions indicates that it is very important to give trainees many opportunities to practice conversation in realistic settings. Accordingly, we have developed authoring tools that enable the rapid creation of animated, interactive dialogs that allow trainees to role-play within Skill Builder lessons. Our upcoming Tactical French course is particularly strong in this regard – it includes over 100 animated dialogs, of which a third are interactive role-playing dialogs. Also, we have introduced scoring functions into these interactive dialogs, a feature common to many games that we think is very valuable for learning. This will further improve the utility of the Skill Builder component, which trainees in this study already found to be useful and interesting.

On a broader scale, the study raises interesting questions about the effectiveness of game-based learning, and game-based language learning in particular. In some respects, the value of the Mission Game component might be hard to quantify. Our expectation is that even if some trainees find the Skill Builder to be more effective as a training tool, the Mission Game might be providing concrete contexts for training that the Skill Builder lacks. This continues to be an area of active research for both us and others in the game-based learning field.

In summary, we consider the study highly useful in establishing a baseline of training capability, and suggesting areas for improvement. We will actively pursue as many of the study's recommendations as possible with the continued support of our sponsors.

Please contact us if you wish to obtain the full, 90-page report.

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Special Operations Forces Language Office

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**Special Operations Language Training Software
Measurement of Effectiveness Study:
Tactical Iraqi Study Final Report**

May, 2007

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EXECUTIVE SUMMARY

Considerable investments are being made in technology-based tools to increase the language training options available to Special Operations Forces (SOF) and other military personnel. The United States Special Operations Command (USSOCOM) commissioned this research to assess the efficacy of two of these training technologies: Tactical Iraqi—a computer-based training and videogame system used to train Iraqi Arabic speaking and listening skills—and the Special Operations Tele-Training Systems (SOFTS)—a virtual classroom platform used to deliver language training. This report describes the Tactical Iraqi study in detail and reports our findings as well as the resulting recommendations. There is a companion report for the SOFTS study.

Research Objective

Our main objective was to evaluate the effectiveness of Tactical Iraqi from an outcome-based perspective. The Special Operations Forces Language Office (SOFLO)—the executive agent for language across USSOCOM—charged us with designing an empirical study (or studies) to collect data from military personnel training with Tactical Iraqi and to assess the effectiveness of the system using a research-based model of training effectiveness. This was not a study to validate the Iraqi language content or the speech recognition technology. Our study asked three broad research questions: (1) Did the trainees learn as a result of training? (2) How did the trainees view the training? and (3) Was the training more/less effective for certain trainees?

Study Participants

The 1st Infantry Division (ID) at Ft. Riley, Kansas, was the focal group for our research. The participants received Iraqi Arabic language and culture instruction from a Defense Language Institute (DLI) mobile training team (MTT) and computer lab time with Tactical Iraqi. Therefore, our study focused on a blended-learning scenario (i.e., integrating multiple instructional methods). Two other populations using Tactical Iraqi served as comparison groups—Marines at 29 Palms (blended training) and participants from DLI (Tactical Iraqi training Only). Since a similar research design and consistent metrics were used, these groups allow us to draw more general, robust conclusions than would be possible from only a single study. Section VI provides details on our methodology, including participants, research design, metrics and analytic strategy.

Key Findings

Examples of key findings from our study are presented below by research question. A comprehensive presentation of the results can be found in Sections VII through X, and a summary of key findings can be found in Section XI.

Did the trainees learn as a result of training?

In general, trainees from all groups demonstrated statistically significant increases ($p < .01$) in both Iraqi Arabic language and culture knowledge as a result of training. Therefore, Tactical Iraqi use did result in learning. The DLI group that received 40 hours of Tactical Iraqi training had the largest increase in knowledge.

In terms of behavioral learning (skill), across Skill Builder lessons, the average percentage of correct speech attempts was approximately 65%, indicating the majority of speech attempts while training in Skill Builder lessons were correct. Average quiz scores across Skill Builder lessons were approximately 70%, which exceeded the minimum standard of 60% specified in the POI. During a post-training mission rehearsal exercise (MRX), roughly one-third of the Ft. Riley trainees felt that they were effective in their Iraqi Arabic speaking and listening skills. These results suggest that some skill was acquired. Additionally, the DLI group completed post-training

Oral Proficiency Interviews, and according to DLI, the majority of the group received an Interagency Language Roundtable rating of 0+ after 40 hours of training.

In terms of affective learning (motivation, self-efficacy, or attitudes), trainees' confidence in their capability to speak and in their capability to listen and understand Iraqi Arabic significantly increased ($p < .01$) as a result of training.

How did the trainees view the training?

In general, participant evaluations of all three components of Tactical Iraqi were slightly favorable. The Skill Builder was seen as providing a significantly more useful ($p < .01$), effective ($p < .01$), engaging ($p < .01$), and enjoyable ($p < .05$) learning experience than the Mission Game module. Videogames are promoted for their ability to engage the learner. Given that the Skill Builder is a traditional computer-based training module and was perceived to be more engaging than the videogame components, this assertion may not hold true universally. The Skill Builder was rated significantly higher in terms of clarity of objectives and ease of use compared to the Arcade Game ($p < .01$ and $p < .05$, respectively) and Mission Game ($p < .01$) and was perceived as better able to prepare trainees for the mission/job compared to the Mission Game ($p < .01$).

Perceptions of the usability of Tactical Iraqi were generally favorable. For example, the audio and video quality, virtual environment, and game interface of tactical Iraqi all had over 64% favorable responses. Trainees indicated the least favorable views of the accuracy of the speech recognition relative to other aspects. Some trainees reported technical glitches.

Satisfaction levels with Tactical Iraqi language training were generally favorable. In general, both Tactical Iraqi and MTT were perceived as equally effective for providing vocabulary, practice, and feedback. However, the MTT was perceived by Ft. Riley participants as providing the best opportunity to learn and practice Iraqi culture knowledge (e.g., over 75% percent favoring MTT). Also, MTT was also perceived as providing the best overall training and the most mission-related training (e.g., over 67% favoring MTT for both). Given a limited amount of time to train, trainees were equally as likely to choose Tactical Iraqi as MTT as a training solution.

Was the training more/less effective for certain trainees?

A number of individual differences (factors which vary across individuals such as aptitude, experience, demographics, attitudes, etc...) were found to be related to training outcomes. Higher pre-training levels of motivation, attitudes toward learning languages, attitudes toward Iraqi Arabic, learning self-efficacy were to be related to higher levels of some post-training outcomes. Other factors, such as age, years of military service and cognitive ability, were found to be predictive of some outcomes as well. Section X presents the results of these trend analyses.

Recommendations and Conclusions

Based on the training effectiveness studies at Ft. Riley, 29 Palms, and DLI, we believe that Tactical Iraqi has merit as a training tool and makes a contribution to developing Iraqi Arabic speaking and listening skills within the narrow range of its program content. However, as with any training program or tool, its effectiveness depends on its alignment with the desired learning objectives and its actual implementation.

Broadly speaking, we recommend the use of Tactical Iraqi primarily as a supplement to a structured language training program (i.e., as a blended learning solution) where military personnel are held accountable for their participation and learning. Evidence suggests that Tactical Iraqi can be used as a standalone training option as well. However, we strongly recommend using Tactical Iraqi as the sole mode of training only when a vigorous, structured

POI can be implemented, when learners can be provided a high level of guidance and feedback, and when the learners can be held to a high level of accountability and standard of achievement.

Although Tactical Iraqi has two videogame components and videogames are designed to be engaging, the reality is that learning Iraqi Arabic is difficult and time consuming and would be challenging to accomplish independently using any self-paced training tool. Therefore, we do not recommend *fire-and-forget* use of Tactical Iraqi as a training strategy for the masses (i.e., handing out the CDs to personnel and considering them trained). However, if an individual has a high-level of aptitude and motivation to learn Iraqi Arabic, then Tactical Iraqi might be a good self-paced instructional tool for those learners. Also, for the individual who has had a moderate-to-high level of previous Iraqi or Modern Standard Arabic training, Tactical Iraqi would likely be a good refresher or mission-specific training tool.

In Sections XII and XIII, general and specific recommendations are provided to improve the Tactical Iraqi system and its use in blended and standalone training contexts. In Section XII, the recommendations are divided into three categories: Tactical Iraqi and POI Structure; Tactical Iraqi Development; and Individual Differences and Training Success. These recommendations can be used by Tactical Iraqi developers and training managers to optimize the effectiveness and impact of Tactical Iraqi as a training tool.

In conclusion, although Tactical Language Training Systems needs to make improvements to the training interface and expand training content, Tactical Iraqi has promise as a training tool if used effectively. Computer-based training and videogames are training tools, just as lectures, group discussions, and role plays. The effectiveness of any training tool—if fundamentally sound in design and content—has to do with the appropriateness of the tool for the learning objectives, content, and context, as well as how the tool is implemented to achieve the learning objectives. It is important to remember that computer-based training and videogames are neither effective nor ineffective in and of themselves, but the *use* of these tools is certainly where the success or failure resides. Future research is needed to determine the best design and implementation of videogames for various types of content, contexts, learning objectives, and learners.

About Surface, Ward, & Associates

Surface, Ward & Associates (SWA) is a personnel research and organizational consulting firm based in Raleigh, NC. Since 1997, SWA has been applying the principles, research, and methods of industrial/organizational (I/O) psychology to assist organizations and their employees in enhancing their performance, solving work-related problems, and addressing workplace issues. SWA is a small business and has worked on government contracts as the prime contractor and as a subcontractor.

SWA consults and conducts research in areas related to (1) training and development (needs assessment, design, evaluation, and effectiveness), (2) performance measurement and management, (3) organizational effectiveness and development, (4) validation research, (5) program/instructional evaluation, and (6) work-related foreign language and cultural proficiency, performance assessment, and training. Our firm is led by I/O psychologists Drs. Eric A. Surface and Stephen J. Ward, who have worked with these issues since 1995.

SWA is structured as a consulting and research network, allowing our core personnel to utilize numerous associates around the country with specialized expertise as needed on a project-by-project basis. Many of our senior associates are university professors who are experts in their fields. Currently, we have three full-time and five part-time employees. We have used approximately 11 contractors on various recent projects.

Our clients have included: Building Construction Products Division, Caterpillar, Inc; North Carolina Cooperative Education Association; seven divisions and the North American staffing organization of IBM; the American Council on the Teaching of Foreign Languages (ACTFL); Language Testing International, Inc. (LTI); the United States Army Special Operations Command (USASOC); and the Special Operations Forces Language Office, (SOFLO), United States Special Operations Command (USSOCOM). Our principals and associates also have experience working with many other organizations, such as Weyerhaeuser, NC Highway Patrol, and AT&T.

One of our areas of specialization relates to research and consulting on foreign or second language and culture in work environments. We have conducted projects related to language proficiency assessment validation and psychometrics research as well as evaluations of language training, training tools, and job aids in work contexts.

Our commitment to conducting model-based research and evidenced-based consulting and to using cutting-edge methodologies sets us apart from many other firms. Being trained as scientist-practitioners, we realize that our clients benefit from having the best quality data and analysis in order to make solid, data-driven decisions. Our goal is to provide our clients with the best research and consulting possible given the constraints of their situations to enhance their mission or business objectives.

For more information about SWA, please contact Dr. Eric A. Surface (esurface@swa-consulting.com) or Dr. Stephen J. Ward (sward@swa-consulting.com).