Training Diagnostics to Improve Learner and Class Outcomes

ALPS INSIGHTS℠

PURPOSE:

ALPS Solutions has worked closely with training programs within the Special Operations Forces (SOF) community to evaluate training effectiveness and identify areas where interventions by program administrators and instructors can have a positive impact on learner- and class-level outcomes.

APPLICATION:

We used predictive analytics (i.e., a variety of statistical techniques that analyze current and historical data to make predictions about future outcomes) to determine which classes have a high probability of post-training success and which ones have a low probability of success. Based on extensive research, certain key predictor variables if identified early in training can help project the probability of success for learners and classes on training outcomes. For those that are projected to be unsuccessful, we can try to influence that outcome by pulling key levers (i.e., intervening during training).

Using formative evaluation data (selected for its theoretical and empirical relationship to outcomes) collected during training can be a powerful tool to improve learner, class, and program outcomes. Training managers and supervisors can use this information to guide resource deployment and interventions when there is hope of affecting outcomes. Although end-of-course surveys provide valuable information and documentation, they cannot be used to improve the training that just ended.

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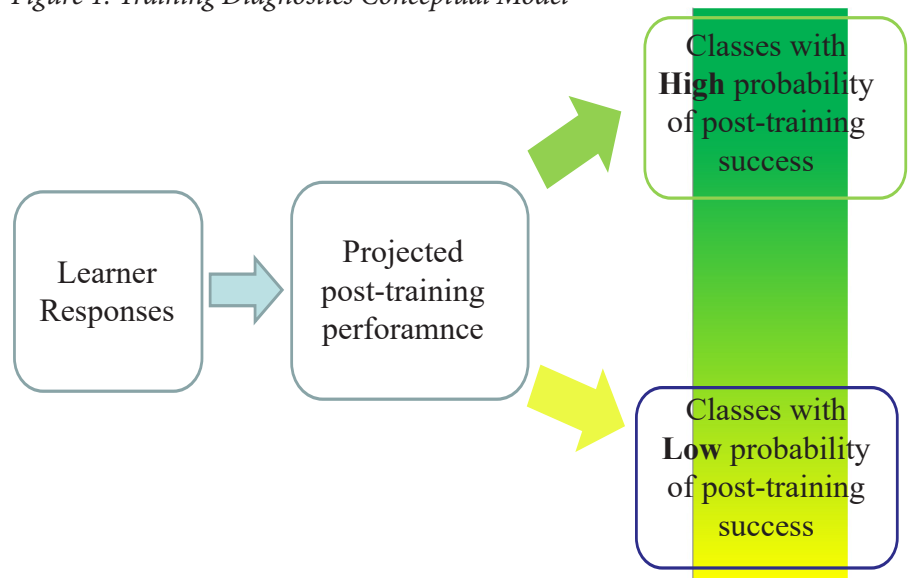
[1]Originally prepared by ALPS Solutions, which was acquired by ALPS Insights.

Introduction

Since 2007, ALPS Solutions has worked closely with training programs within the Special Operations Forces (SOF) community to evaluate training effectiveness and identify areas where interventions by program administrators and instructors can have a positive impact on learner- and class-level outcomes. While much of that effort has focused on evaluation of instructor behaviors (see *Evaluating Instructional Behaviors for Improved Training Outcomes*), many other components and characteristics of the training process and environment have been shown to influence outcomes. The ultimate goal of our research related to training diagnostics was to provide program managers with an evidence-based, easy-to-use tool to monitor learner and instructor issues during training and initiate results-focused interventions during training – as it is too late to help current learners and maximize the training investment after the class is completed.

We used predictive analytics (i.e., a variety of statistical techniques that analyze current and historical data to make predictions about future outcomes) to determine which classes have a high probability of post-training success and which ones have a low probability of success (see Figure 1). We were able to use learner responses to pre- and during-training surveys, individual difference data (e.g., ability data), and information about the training to estimate the rate of learners exceeding standard on their end of course proficiency test (i.e., a 1/1 on the Oral Proficiency Interview [OPI]).[1] Factors that determined the pass rate included learner ability, language difficulty, and class size. Once projected pass rates were determined, classes were rank –ordered in terms of their probability of success in training.

Figure 1. Training Diagnostics Conceptual Model

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[1]The standard is based a dual-modality OPI that tests participatory speaking and listening on the Interagency Language Roundtable (ILR) scale.
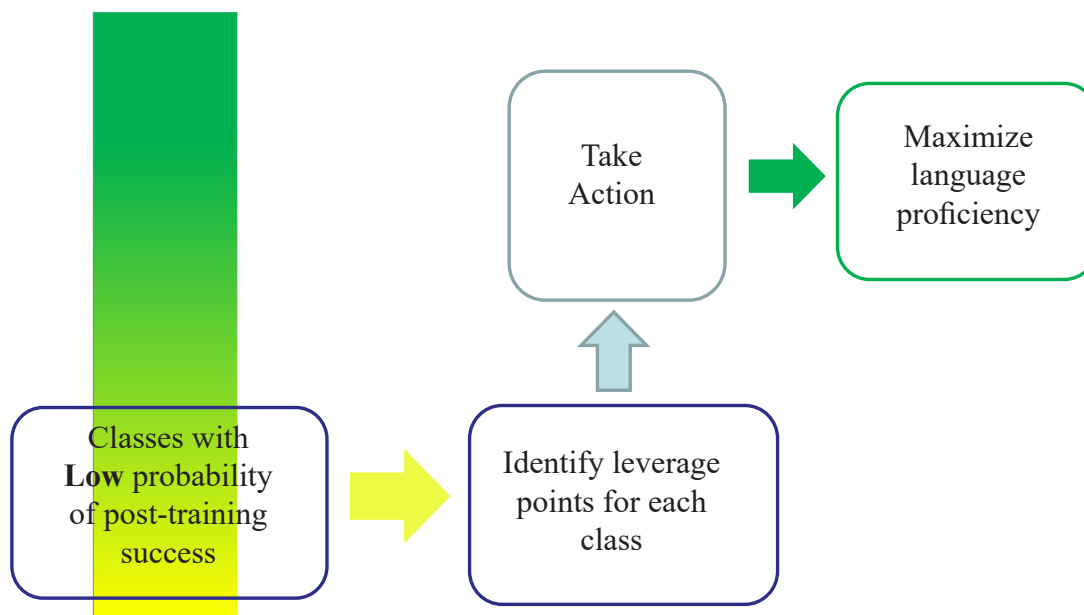
Once classes with a low rate of success are identified, it is possible to identify key leverage points for each class and then take action to maximize language proficiency (see Figure 2). This process allows training managers to focus resources on improving low probability of success classes. This will maximize the cohort's learning and return of investment in the training. It also benefits the individual learners as they will be more successful and not have to be recycled. This cannot be done with post-training, summative evaluation. Formative evaluation is a powerful tool for maximizing individual, class, and program outcomes.

Figure 2. Interventions for classes with low probability of post-training success

Key Levers

In order to identify key levers for Initial Acquisition Training (IAT) in the SOF community, the theoretical, empirical, and best practices literatures in the fields of education, psychology, second language acquisition, and training were reviewed. This review led to the identification of key variables and then research was conducted to evaluate the measurement properties of these constructs and their relation to learner and class outcomes (see Table 1), thus validating the model with SOF language learners. For example, one of the levers we identified was the amount of time learners spend speaking in the target language. In addition to recommendations from the American Council for Teaching of Foreign Languages (ACTFL) that both learners and instructors speak in the target language 90% of the time from the start of training, our empirical research within the SOF community has shown that speaking more in the target language during class leads to better post-training outcomes. In a 2009 study, it was found that within a class, learners who spoke more frequently in the target language were more likely to exceed the ILR level 1/1 OPI standard than classmates. Learners that showed greater growth in the amount they spoke in the TL throughout training were also more likely to exceed the 1/1 OPI standard. At the class level, we found similar results. Classes that spoke more frequently in the target language tended to do so throughout training as did those that spoke less frequently throughout training. Classes that spoke in the target language more frequently, on average, from the onset of training tended to 1) acquire higher average speaking proficiency, 2) have higher pass rates (1/1 on OPI), and 3) have more students who exceeded the 1/1/ OPI standard. Table 1 outlines our key levers and their definitions.

Table 1.

Key Levers in Training and Definitions[2]

Construct	Description
Speaking in the Target Language	The percentage of time in class spent speaking in the target language. The American Council for Teaching of Foreign Languages (ACTFL) recommends that both learners and instructors speak in the target language 90% of the time from the start of training.
Motivation to maintain current proficiency	The degree to which a person wants to maintain their current proficiency in the future
Motivation to improve current proficiency	The degree to which a person wants to improve their current proficiency in the future
Confidence in performing language tasks (Basic, Daily, Military tasks)	Self-efficacy is the belief in one's capabilities to organize and execute the courses of action required to manage prospective situations.
Trainee Course Satisfaction (Materials, Quality, Usefulness, Instructional Technology, Instructor)	The degree to which a person's expectations about various aspects of the course are met or not met.
Self-rated Speaking Proficiency	Self-assessment of how proficient an individual thinks their speaking is.

Application

Based on extensive research, certain key predictor variables if identified early in training can help project the probability of success for learners and classes on training outcomes. For those that are projected to be unsuccessful, we can try to influence that outcome by pulling key levers (i.e., intervening during training).

ALPS Solutions designed diagnostic reports to be accessed by program administrators and language supervisors – not instructors directly. The intention was for the program administrators and supervisors to evaluate the information and then make decisions about the need for interventions and the types of interventions needed. However, depending on the organizational culture and personnel structure, instructors could be provided with this information.

Since we started providing diagnostic information, ALPS Solutions moved from static, paper-based reports to more dynamic web-based tools that we developed. Our Learning Effectiveness Suite (LES) was the first web-based tool we developed and reflects the training diagnostic work we have done, but also expands upon that work utilizing faster data uploads, real-time reporting, and digital housing of historic reports that result in a quicker delivery to managers and administrators. ALPS Ibex™ is our learning evaluation, analytics, and feedback platform that captures, integrates, and analyzes data, providing data-driven insights so clients can take action.

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[2]The following constructs were derived from a comprehensive literature review and have been validated empirically in several studies and reports written by ALPS Solutions.

Conclusion

Using formative evaluation data (selected for its theoretical and empirical relationship to outcomes) collected during training can be a powerful tool to improve learner, class, and program outcomes. Training managers and supervisors can use this information to guide resource deployment and interventions when there is hope of affecting outcomes. Although end-of-course surveys provide valuable information and documentation, they cannot be used to improve the training that just ended.

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