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Behavior Before Belief: Training for Transformative Change in Defense Acquisition

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Abstract

For decades, the Department of Defense has been plagued by persistent cost, schedule, and performance problems in defense acquisition programs. Increasing technological complexity, funding instability, and changing requirements are driving the need for transformative change in the acquisition workforce. Although transformational culture change can rarely be made directly, leaders can change behavior that should create positive outcomes, which can then be incorporated into cultural beliefs. The study's theoretical construct was the behavior-before-belief model of organization change. Recent acquisition policy changes were intended to improve efficiency and are demonstrating some improvements, yet little is understood about whether training efforts related to these policies are producing policy-compliant behavior. The purpose was to examine through an ex post facto, cross-sectional study whether there is a significant relationship between learning from Defense Acquisition University (DAU) training in acquisition policy and application of learned policy-compliant behavior, as represented by the variables learning achieved and applied training. DAU data spanned 19 months, included 334,000 training events, were separated into 40 course-type subgroups, and were analyzed through hierarchical regression. The findings confirmed that the independent variable of learning achieved is predictive of policy-compliant behavior change ($p < .001$). Additionally, predictors of learning and application were determined.

Introduction

The Department of Defense (DoD) requires transformative culture change in the acquisition of defense systems to adapt to environmental changes accelerated by globalization, technology, and fiscal instability. Public policy can be an effective and legitimate instrument for implementing needed change in the DoD. Dissemination of public policy that articulates the policymakers' vision and goals can facilitate implementation of organizational change by first creating behavioral changes (Burke, 2011; Schein, 2010; Wedel et al., 2005). Transformative change implementation strategies should focus on creating new behavioral processes that will lead to cultural changes in support of the needed social or organizational change. It is well-documented that culture change in mature organizations like the DoD cannot be successfully implemented directly; however, behavior can be changed by leaders to drive culture change (Burke, 2011; Clawson, 2012; Harris & Ogbonna, 2011; Linn, 2008; Schein, 2010; Weick & Sutcliffe, 2007; Weier, 2008). Little is known about the drivers of behavior change in the defense acquisition workforce. The purpose of this study was to bridge this gap in knowledge by investigating the relationship between mandated training of the defense acquisition workforce and application of policy-compliant behavior.

My study was conducted to address the quantitative research question: To what extent does the Defense Acquisition University (DAU) policy-based training enhance policy-compliant behavior of the DoD acquisition workforce personnel? To find the answer to this question, two additional questions were posed: What are the important predictors of learning new concepts and behaviors in DAU training, and what are the important predictors of application of learned concepts from DAU training? Application of learned concepts from DAU training was the policy-compliant behavior change tested in this study.

I employed a quantitative, ex post facto, longitudinal study design that used multiple regression techniques to analyze 19 months of DAU secondary survey data. The secondary data collected and maintained by the DAU provided the data required for my data analysis effort, which was designed to generate results that are representative of and can be generalized to the defense acquisition workforce population of approximately 150,000 military and civilian personnel (DAU, 2011; GAO, 2012). All acquisition personnel are required to attend DAU career-field specific certification training (Fishpaw, 2010). Eligible study participants were defense acquisition workforce members who responded to DAU online postevent and follow-up surveys following training events during a 19-month period from January 1, 2014, to July 31, 2015. I further divided the DAU sample of more than 334,000 DAU training events into 40 course type subgroups to avoid bias inequality by ensuring internal homogeneity of subgroups.

A probability sampling design allowed me to ensure that all units of the defense acquisition population had an equal probability of being included in the sample. A stratified random sampling technique was used, since subset proportions in the DAU secondary data were known (Field, 2009). I conducted an a priori power analysis to determine appropriate minimum sample sizes of roughly 50 to 790 depending on effect size for a linear multiple regression fixed model with an R-squared deviation from zero (null hypothesis F-test). Actual sample sizes ranged from roughly 180 to 2150. The study found that the important predictors of *applied training* and *learning achieved* have large effect sizes, therefore, all samples were adequately sized for the regression analysis.

Theoretical Foundation

I based the behavior-before-belief model of culture change, used as the framework for this research, on Edgar Schein's three-stage model of learning/change and his theory that behavior changes can lead to changes in culture. The first stage of cultural change is unfreezing the organization by creating the motivation to change. The literature provided that a rapidly changing environment coupled with crises and scandals creates motivation to change, disconfirms dysfunctional assumptions and behaviors, and builds survival anxiety in the defense acquisition workforce (Brown, 2010; Eide & Allen, 2012; Hannay, 2009; Kotzian, 2010; O'Neil, 2011; Weier, 2008). Formal defense acquisition training reduces learning anxiety by creating a psychologically safe environment and an understanding that a new way of doing business is possible, such as transforming competitive relationships into collaboration and teamwork.

The second stage of cultural change is cognitive restructuring through learning new concepts, new meanings for old concepts, and new judgment standards. The DoD has begun the unfreezing process by changing acquisition policies to drive culture change in response to acquisition program crises driven by a rapidly changing external environment (DoD, 2015; GAO, 2017; Under Secretary of Defense, 2015). These changes encourage an internal environment in which cognitive restructuring can come through new learning. Formal training can provide this new learning experience and is required for all acquisition professionals. The third stage of cultural change is refreezing, or internalizing the new concepts, meanings, and standards by incorporating them into the organization's identity and relationships. If the new learned behaviors correct problems and produce better outcomes, the new lessons should stabilize, be internalized as new tacit assumptions, and eventually lead to culture change (Schein, 2010).

For a large, old organization like the DoD, a critical step for managing culture change is missing from Schein's three-stage model. Although evolutionary change in organizational culture happens naturally in response to external environment changes, the literature suggested that rapid changes in the DoD's environment are creating disequilibria that have forced transformational change to occur, which in turn challenges deeper cultural assumptions (Burke, 2011; Eide & Allen, 2012; Hannay, 2009; Kotzian, 2010; O'Neil, 2011; Stevens, Plaut, & Sanchez-Burks, 2010). Schein (2010) argued that existing cultures that have been successful and stable over time cannot be changed directly unless the organization is dismantled, which is not a viable option for the DoD. However, culture change can be launched by behavior change. Changes in behavior that result in better outcomes will encourage personnel to reexamine their beliefs and assumptions and lead them to adopt new beliefs and assumptions.

The behavior-before-belief model of culture change (Table 1) adds a stage between Stages 2 and 3 of the three-stage model of learning/change presented by Schein (2010). The additional stage is *applying new behaviors learned to correct problems and produce better outcomes*. The DAU can teach acquisition policy, but the DAU cannot make acquisition professionals learn new policy-compliant behaviors or apply these learned behaviors on the job. I conducted the research in two parts focusing of Stages 2 and 3 of the expanded model. Part 1 of the study tested student learning of new concepts in DAU policy training courses and determined the predictors of learning. Part 2 of the study examined students' on-the-job application of new behaviors learned following DAU policy training courses and determined the predictors of the students' ability to apply the training.

Table 1. Behavior-Before-Belief Model of Culture Change
(Adapted from Schein, 2010)

Behavior-Before-Belief Model of Culture Change	
1	Unfreezing the organization by creating the motivation to change
2	Cognitive restructuring through learning new concepts, new meanings for old concepts, and new judgment standards
3	Applying new behaviors learned to correct problems and produce better outcomes
4	Refreezing, or internalizing the new concepts, meanings, and standards

Null and Research Hypothesis

Using the behavior-before-belief model of culture change, predictors of State 2, learning new concepts, and Stage 3, applying new behaviors learned, outcomes were tested using statistical analysis of secondary data provided by the DAU. The outcome *learning new concepts* is represented in the data by the variable *learning achieved*. The outcome *applying new behaviors* learned is represented in the data by the variable *applied training*. The 13 hypotheses tested in this study are provided in Table 2.

Table 2. Null and Research Hypothesis

	Null Hypothesis Either that the correlation coefficient is equal to zero or that the slope weight is equal to zero, which means that there is not a correlation, or relationship, between…	**Research Hypothesis** There is a significant positive correlation between…
Hypothesis 1	the predictor, *career benefit*, and the outcome, *learning achieved*	*career benefit* and *learning achieved* and that *learning achieved* can be predicted from *career benefit*
Hypothesis 2	the predictor, *worthwhile investment*, and the outcome, *learning achieved*	*worthwhile investment* and *learning achieved* and that *learning achieved* can be predicted from *worthwhile investment*
Hypothesis 3	the predictor, *exercises value*, and the outcome, *learning achieved*.	*exercises value* and *learning achieved* and that *learning achieved* can be predicted from *exercises value*
Hypothesis 4	the predictor, *examples helped*, and the outcome, *learning achieved*	*examples helped* and *learning achieved* and that *learning achieved* can be predicted from *examples helped*
Hypothesis 5 (Instructor-Led Training [ILT] Only)	the predictor, *instructor enthusiasm*, and the outcome, *learning achieved*	*instructor enthusiasm* and *learning achieved* and that *learning achieved* can be predicted from *instructor enthusiasm*
Hypothesis 6 (ILT Only)	the predictor, *application discussed*, and the outcome, *learning achieved*	*application discussed* and *learning achieved* and that *learning achieved* can be predicted from *application discussed*
Hypothesis 7 (ILT Only)	the predictor, *instructor knowledge*, and the outcome, *learning achieved*	*instructor knowledge* and *learning achieved* and that *learning achieved* can be predicted from *instructor knowledge*
Hypothesis 8 (Self-Paced Web [SPW] Only)	the predictor, *delivery effective*, and the outcome, *learning achieved*	*delivery effective* and *learning achieved* and that *learning achieved* can be predicted from *delivery effective*
Hypothesis 9 (SPW Only)	the predictor, *graphics meaningful*, and the outcome, *learning achieved*	*graphics meaningful* and *learning achieved* and that *learning achieved* can be predicted from *graphics meaningful*
Hypothesis 10	the predictor, *learning achieved*, and the outcome, *applied training*	*learning achieved* and *applied training* and that *applied training* can be predicted from *learning achieved*
Hypothesis 11	the predictor, *task applicability*, and the outcome, *applied training*	*task applicability* and *applied training* and that *applied training* can be predicted from *task applicability*
Hypothesis 12	the predictor, *resources provided*, and the outcome, *applied training*	*resources provided* and *applied training* and that *applied training* can be predicted from *resources provided*
Hypothesis 13	the predictor, *manager involvement*, and the outcome, *applied training*	*manager involvement* and *applied training* and that *applied training* can be predicted from *manager involvement*

Data Collection

The large DAU dataset was divided into 40 subset samples broken out by postevent or follow-up survey type and for the covariates, delivery type and functional topic. The postevent survey data, collected at the end of each course, supported regression analysis of predictors of the *learning achieved* outcome. The follow-up survey data, collected greater than 60 days post course, provided the data needed for regression analysis of predictors of the *applied training* outcome.

The two training delivery type covariates are instructor-led training (ILT) and self-paced web training (SPW). The 10 functional course topic covariates provide required training for the major defense acquisition functional certifications and included acquisition (ACQ); business, cost estimating, and financial management (BCF); contract management (CM); contracting (CON); engineering (ENG); logistics (LOG); program management (PMT); production, quality and manufacturing (PQM); science and technology management (STM); and test and evaluation (TST). All acquisition workforce personnel are required to take online and residency courses for functional certification represented in these samples and are provided the opportunity to respond to postevent and follow-up surveys. Random sampling techniques were used to provide appropriately sized data samples for analysis, as needed. I analyzed multiple samples within the larger data subsets and compared the SPSS outputs to ensure consistent results.

Study Results

I used IBM SPSS Statistics 21 to perform multiple regression analyses on the DAU postevent and follow-up survey data samples to test whether the outcome *learning achieved* and the outcome *applied training* can be predicted by a linear combination of multiple predictor variables. Regression was used to find the best-fitting straight line, or regression line, for the DAU data set. The regression line was then used to predict the outcome value from the value of the predictor variables (Field, 2009).

The regression model must be unbiased for the findings to be generalized to the broader acquisition workforce population, which means that on average the sample and the population models would be the same. To be sure that this is true, necessary underlying assumptions must be met. These assumptions include variable types (independent variables are quantitative or categorical and dependent variables are quantitative, continuous, and unbounded), nonzero variance (independent variables), no perfect multicollinearity, homoscedasticity, independent variables are uncorrelated with external variables, independent errors, normally distributed errors, independence (dependent variable values from separate entity), and linearity (Field, 2009; Green & Salkind, 2011). Each of these assumptions was checked using SPSS validation techniques and these assumptions were met. This means the regression model from the sample is the same, on average, as the regression model from the population (Field, 2009). A comprehensive analysis of the multiple regression results from the samples was performed.

Analysis (Part 1): Predictors of Learning Achieved

Descriptive statistics characterize the 20 samples used for the analysis of Stage 2 of the behavior-before-belief model of culture change to determine important predictors of the *learning achieved* outcome for both the ILT and SPW DAU courses. The descriptive statistics included mean, standard deviation, and sample size. The means of the Likert score (7 = strongly agree and 1 = strongly disagree) responses to the variables indicated how the students in each sample perceived the variable in question. The means of the *learning achieved* outcome for resident ILT courses ranged from a low of 5.76 for ENG to a high of 6.53 for CM. For online SPW courses, the means for *learning achieved* ranged from a low of 5.38 for ENG to a high of 5.88 for CM. These findings indicate resident ILT courses may be more effective in achieving learning than online SPW courses.

For the resident ILT courses, the instructor variables tend to have the highest mean scores even though regression analysis results provided in this paper indicated that the instructor variables are the least important predictors of learning. The variables that measured how worthwhile the training was tended to have the lowest mean scores even though analysis shows them to be the most important predictors of learning. The online courses showed similar results with the most important predictors of learning being scored the lowest on the postevent surveys.

I used the SPSS correlation matrix for each sample as a starting point for exploring the relationships between predictors and the outcome and for an initial check for multicollinearity. The correlation matrix showed the value of Pearson's correlation coefficient between variable pairs. No collinearity was found in the data, because there were no substantial correlations $(r > .9)$ between predictors. The findings confirmed that the *career benefit* variable correlates best with the outcome $(p < .001)$, so this variable should best predict *learning achieved*. This finding supports the Bontis, Hardy, and Mattox (2011) study which found the strongest driver of learning in DAU courses was whether the student believed that the training was worthwhile. I chose the hierarchical method for variable entry into the model, so summary statistics were repeated for each hierarchy stage.

The SPSS model summaries provided the multiple correlation coefficient (R) between the predictors and the outcome and the value of R-square (data included in Table 3), which measured how much of the outcome variability is accounted for by the predictors (Field, 2009). Model 1 had only the *career benefit* and *worthwhile investment* predictors included and the R-square values for all samples ranged from a high of .695 for LOG SPW to as little as .422 for ACQ ILT. This means that for all samples *career benefit* and *worthwhile investment* accounted for between 42% and 70% of the variation in *learning achieved* depending on functional topic and delivery method. However, when the *exercises value* and *examples helped* predictors are included in model 2, this value increases to as much as .721 or 72% (LOG SPW), and as little as .533 or 53% (ACQ ILT) of the variance in *learning achieved*. When the remaining predictors are added in Model 3, this value increases only slightly to 73% for LOG SPW and 54% for ACQ ILT. These findings indicate that the predictors specific to the training delivery type account for 1% or less of the variability in the outcome, *learning achieved*. The predictors specific to the ILT delivery type are *instructor enthusiasm, application discussed*, and *instructor knowledge*. The predictors specific to the SPW delivery type are *delivery effective* and *graphics meaningful*.

The adjusted R-square was analyzed for all subsets and gives some idea of how well the model can be generalized to the defense acquisition workforce population. For all samples, the adjusted R-square value was the same, or close to, the value of R-square, meaning that testing the population model instead of a sample model would account for the same outcome variance (Green & Salkind, 2011). The change statistics described the difference made when new predictors were added to the model by reporting whether the change in R-square is significant. This was tested using an F-ratio and the change in F was analyzed for all data samples.

The Durbin-Watson statistic was analyzed to determine whether the assumption of independent errors is correct, which means that observation residual terms are uncorrelated. A conservative rule suggests that values less than 1 or greater than 3 could be problematic (Field, 2009). The value should be close to 2. All of the samples met this criterion; therefore, the assumption of independent errors is tenable.

The SPSS ANOVA provided the variance analysis to test whether the regression model was better than using the mean to predict the outcome. For all samples, the three models were highly significant. It is very unlikely for these values to have happened by chance. I found that use of the model provided significant improvement in my ability to predict the outcome variable, *learning achieved*, over using the mean as an estimate of *learning achieved*. These findings mean the null hypothesis that no relationship exists should be rejected (Field, 2009).

For brevity, the following provides analysis examples for specific course types. I provide the results for all course types in the Regression Summary Tables 3 and 4. The SPSS coefficients table (data included in Table 3) shows the model parameters for each step in the hierarchy. The first step in the hierarchy included *career benefit* and *worthwhile investment*. For ACQ SPW, SPSS results provide that B (Y intercept constant) is 1.678 and this can be interpreted as meaning that when no benefit to career or employer occurs (when X = 0), the model predicts very low *learning achieved* scores will result. The B values of .449 for *career benefit* and .271 for *worthwhile investment* represent the outcome change associated with a unit change in the predictor. If the predictor variable is increased by one on the Likert scale for *career benefit*, then the model predicts that *learning achieved* increases by 0.449 on the Likert scale following acquisition web-based training of acquisition professionals.

These results indicate that the regression model is useful, because it significantly improves the ability to predict learning from defense acquisition policy training. To make predictions for ACQ SPW, I would define the model as follows:

learning achieved = 0.945 + (0.308career) + (0.187worthwhile) + (0.079exercises) + (0.107examples) + (0.111delivery)

For comparison, the model for ACQ ILT would be defined as

learning achieved = -0.027 + (0.253career) + (0.044worthwhile) + (0.374exercises) + (0.109examples) + (0.100enthusiasm) + (0.047application)

This allows a prediction about *learning achieved* for online SPW and resident ILT acquisition courses to be made by replacing the predictors with values of interest.

For the ACQ ILT model, the *career benefit* ($t(1818) = 10.692$, $p < .001$), *worthwhile investment* ($t(1818) = 2.212$, $p < .05$), *exercises value* ($t(1818) = 10.640$, $p < .001$), *examples helped* ($t(1818) = 2.831$, $p < .01$), *instructor enthusiasm* ($t(1818) = 2.380$, $p < .05$), *application discussed* ($t(1818) = 2.376$, $p < .05$), and *instructor knowledge* ($t(1818) = 1.253$, not sig.) are all significant predictors of *learning achieved*, except for *instructor knowledge*. The magnitude of the t-statistics indicates that the *career benefit* and *exercises value* predictors had the greatest impact and that *instructor knowledge* had no significant impact on the *learning achieved* outcome. Although all course topic and delivery combination results provided that *career benefit* was the most important predictor, the other predictors varied greatly in their importance in predicting *learning achieved* in DAU classes across delivery types and functional topics.

For ACQ ILT, the standardized beta values for *career benefit* (Beta = .336) and *exercises value* (Beta = .293) are more than three times that of any other predictor and are, therefore, of much greater importance than any of the other variables in the model. Most of the ACQ ILT model predictors have relatively tight confidence intervals that do not cross zero; however, the *instructor knowledge* predictor confidence interval does cross zero, which supported the finding that this variable is not a significant predictor of *learning achieved* for the ACQ ILT model.

The coefficients tables for the samples showed no collinearity in the data. The VIF values for all samples were well less than 10 indicating no cause for concern. The average VIF values were not substantially greater than 1, so the regression is assumed to be unbiased. No tolerance values fell below 0.2. Based on these results, I concluded that there is not a collinearity problem within the data.

The data samples were also examined for extreme cases that have a standardized residual less than -2 or greater than 2 using the summary table of the residual statistics. When analyzing the 20 samples, I expected 95% of the cases to have standard deviation residuals within about + or – 2. The cases that had standardized residuals greater than 3 were large enough to warrant further investigation. SPSS residuals statistics and case summaries provide that none of the cases had a Cook's distance greater than 1 (the worst case was .097); therefore, none of the cases had an undue influence on the model. The Mahalanobis distance values of greater than 25 also supported the conclusion that these cases may be problematic and further investigation was warranted.

For each of the outlier cases, I analyzed the survey scores for the outcome and significant predictors (*learning achieved, career benefit, worthwhile investment, exercises value,* and *instructor knowledge*) and the response to the variables “what percent of your total work time requires the knowledge or skills presented in this training?” and “the participant materials (manual, presentation handouts) will be useful on the job.” The additional variables associated with some of these cases indicated that the students’ work required 0% of the training provided and they strongly disagreed that the material was useful on the job. For the other cases, the additional variables indicated that the student’s work required only 10% of the training provided and the student strongly disagreed that the material was useful on the job. It is likely that learning did not occur because the training was not useful in the student’s current job, which aligns relatively well with the regression model that has training value as a primary predictor of learning. The cases examined are likely a problem with “having the wrong butts in seats,” or students for whom the defense acquisition policies taught do not apply in their workplace. The model appears to be reliable without undue influence by outlier cases.

Histograms, standardized residuals (*ZRESID) against standardized predicted values (*ZPRED) plots, and normal probability plots of the residuals were also analyzed to check that all assumptions have been met. All sample scatterplots showed a relatively even dispersion with no funneling or curvature, so the assumptions of linearity and homoscedasticity were likely met. The sample histograms showed relatively normal distributions or bell curves and deviations from normality were not seen in the normal probability plot for any of the samples, which indicated that the normality of residuals assumption has likely been met. Partial plots were analyzed to confirm homoscedasticity and linear relationships. For all samples, there are few obvious outliers on the plots and the dots appear to be relatively evenly spaced around a gradient line, which is an indicator of homoscedasticity.

I provide the key results from the regression analysis of the predictors of *learning achieved* in the Regression Summary Table 3. The findings from my analysis of the data indicated that the model appears to be accurate for the samples tested and generalizable to the defense acquisition workforce.

Table 3. Regression Summary—Predictors of Learning Achieved

Model		ACQ						BCF					
		ILT (*N*=1826)			SPW (*N*=1532)			ILT (*N*=1474)			SPW (*N*=1366)		
		B	Std. Error	Beta	*B*	Std. Error	Beta	*B*	Std. Error	Beta	*B*	Std. Error	Beta
1	(Constant)	3.394	.083		1.678	.089		2.526	.093		1.456	.106	
	I will benefit from what I learned in the course for my career/professional development.	.377	.024	**.502***	.449	.027	**.477***	.327	.025	**.392***	.516	.033	**.531***
	This training was a worthwhile investment for my employer.	.115	.022	**.169***	.271	.024	**.324***	.284	.023	**.371***	.212	.031	**.233***
		***R*-square = .422**			***R*-square = .588**			***R*-square = .522**			***R*-square = .545**		
2	(Constant)	.812	.150		1.044	.104		.916	.136		.842	.125	
	I will benefit from what I learned in the course for my career/professional development.	.269	.022	**.358***	.318	.029	**.338***	.241	.023	**.289***	.417	.034	**.428***
	This training was a worthwhile investment for my employer.	.055	.020	**.082****	.218	.024	**.260***	.184	.022	**.241***	.152	.031	**.168***
	The exercises added value to my learning.	.380	.035	**.298***	.128	.034	**.125***	.318	.034	**.275***	.200	.040	**.179***

Model		*B*	Std. Error	Beta	*B*	Std. Error	Beta	*B*	Std. Error	Beta	*B*	Std. Error	Beta
	The examples presented helped me understand the content.	.166	.037	**.120***	.158	.035	**.146***	.105	.035	**.085****		**Not Sig.**	
		***R*-square change = .111**			***R*-square change = .030**			***R*-square change = .072**			***R*-square change = .025**		
3	(Constant)	-.027	.249		.945	.105		.263	.269		.727	.129	
	I will benefit from what I learned in the course for my career/professional development.	.253	.024	**.336***	.308	.029	**.328***	.231	.026	**.276***	.411	.034	**.423***
	This training was a worthwhile investment for my employer.	.044	.020	**.065*****	.187	.024	**.224***	.176	.022	**.230***	.139	.031	**.153***
	The exercises added value to my learning.	.374	.035	**.293***	.079	.035	**.078*****	.312	.034	**.269***	.161	.042	**.144***
	The examples presented helped me understand the content.	.109	.039	**.079****	.107	.036	**.099****		**Not Sig.**			**Not Sig.**	
	The instructor's energy and enthusiasm kept the participants actively engaged.	.100	.042	**.057*****				.089	.033	**.058****			
	On-the-job application of each class objective was discussed during the course.	.047	.020	**.055*****					**Not Sig.**				
	The instructor was knowledgeable about the subject.		**Not Sig.**						**Not Sig.**				
	This delivery method was an effective way for me to learn the material.				.111	.023	**.123***					**Not Sig.**	
	The graphics and illustrations used were meaningful and within context.					**Not Sig.**					.106	.039	**.092****
		***R*-square change = .007**			***R*-square change = .010**			***R*-square change = .004**			***R*-square change = .004**		
		*(*p* < .001) **(*p* < .01) ***(*p* < .05)			*(*p* < .001) **(*p* < .01) ***(*p* < .05)			*(*p* < .001) **(*p* < .01) ***(*p* < .05)			*(*p* < .001) **(*p* < .01) ***(*p* < .05)		

Note. Dependent Variable: I learned new knowledge and skills.
DAU Postevent Surveys

Model		CM						CON					
		ILT (*N*=1668)			SPW (*N*=1462)			ILT (*N*=2000)			SPW (*N*=1588)		
		B	Std. Error	Beta	*B*	Std. Error	Beta	*B*	Std. Error	Beta	*B*	Std. Error	Beta
1	(Constant)	2.059	.107		.734	.130		2.040	.081		.971	.101	
	I will benefit from what I learned in the course for my career/professional development.	.405	.027	**.423***	.517	.034	**.459***	.412	.021	**.460***	.545	.026	**.536***
	This training was a worthwhile investment for my employer.	.284	.024	**.338***	.320	.031	**.304***	.286	.018	**.362***	.264	.024	**.275***
		***R*-square = .520**			***R*-square = .527**			***R*-square = .609***			***R*-square = .593**		
2	(Constant)	1.465	.114		.474	.162		1.455	.096		.660	.109	
	I will benefit from what I learned in the course for my career/professional development.	.307	.027	**.320***	.477	.035	**.424***	.320	.021	**.357***	.436	.030	**.429***
	This training was a worthwhile investment for my employer.	.210	.023	**.249***	.296	.032	**.281***	.232	.018	**.294***	.230	.024	**.240***
	The exercises added value to my learning.	.084	.017	**.116***	.145	.044	**.114****	.180	.023	**.193***	.158	.039	**.149***

	The examples presented helped me understand the content.	.181	.024	**.186***		**Not Sig.**		.055	.026	**.052*****		**Not Sig.**	
		***R*-square change = .046**			***R*-square change = .005**			***R*-square change = .030**			***R*-square change = .014**		
3	(Constant)	1.107	.159		.382	.168		.804	.151		.542	.110	
	I will benefit from what I learned in the course for my career/professional development.	.305	.030	**.318***	.470	.035	**.417***	.249	.023	**.279***	.414	.029	**.407***
	This training was a worthwhile investment for my employer.	.204	.023	**.243***	.288	.033	**.274***	.222	.018	**.281***	.200	.025	**.209***
	The exercises added value to my learning.	.083	.017	**.114***	.139	.044	**.110****	.171	.023	**.183***	.123	.039	**.117****
	The examples presented helped me understand the content.	.164	.026	**.168***		**Not Sig.**		-.003	.026	**-.003**		**Not Sig.**	
	The instructor's energy and enthusiasm kept the participants actively engaged.		**Not Sig.**					.072	.021	**.064****			
	On-the-job application of each class objective was discussed during the course.		**Not Sig**					.112	.019	**.121***			
	The instructor was knowledgeable about the subject.	.084	.035	**.061*****				.059	.029	**.036*****			
	This delivery method was an effective way for me to learn the material.					**Not Sig.**					.128	.025	**.129***
	The graphics and illustrations used were meaningful and within context.					**Not Sig.**						**Not Sig.**	
		***R*-square change = .003**			***R*-square change = .001**			***R*-square change = .013**			***R*-square change = .009**		
		*($p < .001$) **($p < .01$) ***($p < .05$)			*($p < .001$) **($p < .01$) ***($p < .05$)			*($p < .001$) **($p < .01$) ***($p < .05$)			*($p < .001$) **($p < .01$) ***($p < .05$)		

Note. Dependent Variable: I learned new knowledge and skills.
DAU Postevent Surveys

Model		ENG						LOG					
		ILT (*N*=1484)			SPW (*N*=1417)			ILT (*N*=1489)			SPW (*N*=1558)		
		B	Std. Error	Beta	*B*	Std. Error	Beta	*B*	Std. Error	Beta	*B*	Std. Error	Beta
1	(Constant)	2.052	.085		1.079	.097		2.788	.087		1.162	.074	
	I will benefit from what I learned in the course for my career/professional development.	.462	.027	**.527***	.392	.029	**.389***	.391	.024	**.499***	.529	.027	**.563***
	This training was a worthwhile investment for my employer.	.207	.024	**.266***	.391	.027	**.427***	.186	.022	**.255***	.254	.025	**.296***
		***R*-square = .581**			***R*-square = .607**			***R*-square = .520**			***R*-square = .695**		
2	(Constant)	.779	.106		.728	.114		.600	.137		.624	.091	
	I will benefit from what I learned in the course for my career/professional development.	.316	.025	**.361***	.322	.031	**.320***	.256	.023	**.327***	.402	.028	**.429***
	This training was a worthwhile investment for my employer.	.130	.022	**.168***	.353	.027	**.386***	.138	.020	**.189***	.198	.024	**.231***
	The exercises added value to my learning.	.253	.028	**.252***	.102	.038	**.095****	.228	.034	**.194***	.256	.035	**.243***

	The examples presented helped me understand the content.	.163	.031	**.146***	.063	.038	**.055**	.279	.036	**.215***		**Not Sig.**	
		***R*-square change = .081**			***R*-square change = .010**			***R*-square change = .099**			***R*-square change = .027**		
3	(Constant)	.075	.187		.636	.117		.107	.262		.443	.093	
	I will benefit from what I learned in the course for my career/professional development.	.279	.026	**.318***	.321	.031	**.318***	.220	.025	**.280***	.387	.027	**.413***
	This training was a worthwhile investment for my employer.	.117	.022	**.151***	.334	.027	**.365***	.130	.020	**.179***	.177	.024	**.205***
	The exercises added value to my learning.	.236	.028	**.235***		**Not Sig.**		.206	.034	**.176***	.180	.036	**.171***
	The examples presented helped me understand the content.	.121	.031	**.108***		**Not Sig.**		.263	.037	**.203***		**Not Sig.**	
	The instructor's energy and enthusiasm kept the participants actively engaged.		**Not Sig.**						**Not Sig.**				
	On-the-job application of each class objective was discussed during the course.	.097	.023	**.093***				.081	.021	**.092***			
	The instructor was knowledgeable about the subject.		**Not Sig.**					.152	.061	**.064*****			
	This delivery method was an effective way for me to learn the material.				.124	.027	**.123***				.148	.024	**.143***
	The graphics and illustrations used were meaningful and within context.					**Not Sig.**						**Not Sig.**	
		R-square change = .008			**R-square change = .007**			**R-square change = .006**			**R-square change = .010**		
		*($p < .001$) **($p < .01$) ***($p < .05$)			*($p < .001$) **($p < .01$) ***($p < .05$)			*($p < .001$) **($p < .01$) ***($p < .05$)			*($p < .001$) **($p < .01$) ***($p < .05$)		

Note. Dependent Variable: I learned new knowledge and skills.
DAU Postevent Surveys

Model		PMT						PQM					
		ILT (*N*=1847)			SPW (*N*=1377)			ILT (*N*=1832)			SPW (*N*=1401)		
		B	Std. Error	Beta	*B*	Std. Error	Beta	*B*	Std. Error	Beta	*B*	Std. Error	Beta
1	(Constant)	2.058	.098		1.127	.112		2.769	.092		1.148	.109	
	I will benefit from what I learned in the course for my career/professional development.	.456	.024	**.489***	.440	.033	**.429***	.379	.024	**.451***	.536	.031	**.526***
	This training was a worthwhile investment for my employer.	.226	.022	**.273***	.316	.031	**.335***	.201	.022	**.259***	.229	.028	**.247***
		***R*-square = .523**			***R*-square = .532**			***R*-square = .453**			***R*-square = .549**		
2	(Constant)	1.177	.118		.838	.129		.267	.164		.582	.132	
	I will benefit from what I learned in the course for my career/professional development.	.365	.024	**.391***	.390	.034	**.381***	.253	.023	**.301***	.439	.033	**.431***
	This training was a worthwhile investment for my employer.	.150	.021	**.180***	.263	.032	**.278***	.155	.020	**.200***	.168	.029	**.182***
	The exercises added value to my learning.	.186	.027	**.183***	.158	.037	**.153***	.213	.033	**.158***	.188	.051	**.161***

	The examples presented helped me understand the content.	.116	.030	**.103***		**Not Sig.**		.324	.035	**.217***		**Not Sig.**	
		***R*-square change = .042**			***R*-square change = .012**			***R*-square change = .081**			***R*-square change = .019**		
	(Constant)	.509	.163		.907	.133		-.660	.238		.483	.136	
	I will benefit from what I learned in the course for my career/professional development.	.325	.026	**.348***	.393	.034	**.384***	.222	.025	**.264***	.428	.033	**.420***
	This training was a worthwhile investment for my employer.	.138	.021	**.167***	.238	.032	**.252***	.150	.020	**.193***	.158	.029	**.171***
	The exercises added value to my learning.	.173	.026	**.170***	.158	.038	**.153***	.182	.033	**.135***	.154	.052	**.132****
3	The examples presented helped me understand the content.		**Not Sig.**			**Not Sig.**		.256	.037	**.171***		**Not Sig.**	
	The instructor's energy and enthusiasm kept the participants actively engaged.		**Not Sig.**						**Not Sig.**				
	On-the-job application of each class objective was discussed during the course.	.063	.023	**.066****				.057	.022	**.063*****			
	The instructor was knowledgeable about the subject.	.108	.035	**.071****				.129	.054	**.061*****			
	This delivery method was an effective way for me to learn the material.				.141	.027	**.149***				.084	.033	**.076*****
	The graphics and illustrations used were meaningful and within context.				-.118	.037	**-.104****					**Not Sig.**	
		***R*-square change = .010**			***R*-square change = .009**			***R*-square change = .009**			***R*-square change = .003**		
		*($p < .001$) **($p < .01$) ***($p < .05$)			*($p < .001$) **($p < .01$) ***($p < .05$)			*($p < .001$) **($p < .01$) ***($p < .05$)			*($p < .001$) **($p < .01$) ***($p < .05$)		

Note. Dependent Variable: I learned new knowledge and skills.
DAU Postevent Surveys

Model		STM						TST					
		ILT (*N*=878)			SPW (*N*=0)			ILT (*N*=1213)			SPW (*N*=1371)		
		B	Std. Error	Beta	*B*	Std. Error	Beta	*B*	Std. Error	Beta	*B*	Std. Error	Beta
1	(Constant)	1.595	.125					1.701	.103		1.062	.116	
	I will benefit from what I learned in the course for my career/professional development.	.486	.034	**.505***				.539	.027	**.576***	.445	.032	**.418***
	This training was a worthwhile investment for my employer.	.247	.030	**.300***				.188	.023	**.240***	.349	.029	**.366***
		***R*-square = .585**			***R*-square =**			***R*-square = .608**			***R*-square = .553**		
2	(Constant)	.781	.173					.465	.145		.529	.136	
	I will benefit from what I learned in the course for my career/professional development.	.398	.036	**.413***				.425	.028	**.455***	.364	.033	**.342***
	This training was a worthwhile investment for my employer.	.209	.029	**.254***				.125	.022	**.160***	.290	.029	**.304***
	The exercises added value to my learning.	.171	.038	**.153***				.245	.034	**.210***	.139	.031	**.132***

	The examples presented helped me understand the content.		Not Sig.					.111	.037	**.087****	.088	.036	**.072*****
		***R*-square change = .024**			***R*-square change =**			***R*-square change = .044**			***R*-square change = .020**		
	(Constant)	.117	.263					.141	.251		.462	.138	
	I will benefit from what I learned in the course for my career/professional development.	.375	.038	**.389***				.392	.030	**.420***	.356	.033	**.335***
	This training was a worthwhile investment for my employer.	.198	.029	**.240***				.119	.022	**.152***	.245	.030	**.257***
	The exercises added value to my learning.	.157	.039	**.141***				.232	.034	**.200***	.115	.031	**.109***
3	The examples presented helped me understand the content.		**Not Sig.**					.087	.038	**.068*****		**Not Sig.**	
	The instructor's energy and enthusiasm kept the participants actively engaged.		**Not Sig.**						**Not Sig.**				
	On-the-job application of each class objective was discussed during the course.		**Not Sig.**					.073	.028	**.068****			
	The instructor was knowledgeable about the subject.	.122	.054	**.067*****					**Not Sig.**				
	This delivery method was an effective way for me to learn the material.										.124	.028	**.126***
	The graphics and illustrations used were meaningful and within context.											**Not Sig.**	
		***R*-square change = .006** *($p < .001$) **($p < .01$) ***($p < .05$)			***R*-square change =** *($p < .001$) **($p < .01$) ***($p < .05$)			***R*-square change = .003** *($p < .001$) **($p < .01$) ***($p < .05$)			***R*-square change = .008** *($p < .001$) **($p < .01$) ***($p < .05$)		

Note. Dependent Variable: I learned new knowledge and skills.
DAU Postevent Surveys

Analysis (Part 2)—Predictors of Applied Training

I conducted the analysis for Part 2 of the study in the same manner; however, the data used was from the follow-up surveys provided to students greater than 60 days after training. All regression assumptions were met. Descriptive statistics characterize the 20 samples used for the analysis of Stage 3 of the four-stage culture change model to determine important predictors of the *applied training* outcome for both the ILT and SPW DAU courses. The descriptive statistics include mean, standard deviation, and sample size. The means of the Likert score (7 = strongly agree and 1 = strongly disagree) and percentage score responses to the variables indicate how the students in each sample perceive the variable in question. The *applied training* outcome means for resident ILT courses range from a low of 5.23 for ENG to a high of 6.11 for CM. For online SPW courses, the means for *learning achieved* range from a low of 4.98 for LOG to a high of 5.81 for CM. A review of the means shows that resident ILT courses appear to be more effective in driving workplace application of behavior learned from training compared to online SPW courses.

The means of *learning achieved* from the follow-up survey responses align relatively well with the means of *learning achieved* from the postevent surveys. The follow-up survey means for resident ILT courses ranged from a low of 5.74 for ENG and STM to a high of

6.34 for PMT. For online SPW courses, the means for *learning achieved* from follow-up surveys ranged from a low of 5.53 for LOG to a high of 6.00 for CM. The results showed higher *learning achieved* scores for resident ILT courses than for the online SPW courses for all functional areas.

For the resident ILT courses, the *learning achieved* variable has the highest mean scores, and regression analysis results indicate that the *learning achieved* variable is the most important predictor of application of behavior learned in training. The *manager involvement* variable has the lowest mean scores, but *manager involvement* is the least important of the tested predictors of *applied training*. The online SPW courses showed similar results with the most important predictor of *applied training* having received the highest Likert scores.

The findings confirmed that out of the four predictors across all data subsets, the *learning achieved* variable correlates best with the outcome ($p < .001$), so this variable should best predict *applied training*. Learning accounts for 76% for ACQ ILT, so t*ask applicability, resources provided*, and *manager involvement* account for 7% of outcome variation. For PMT ILT, learning accounts for 29%, so *task applicability, resources provided,* and *manager involvement* account for 20% of the variation in *applied training*. PMT ILT is unique in providing 400 level courses, however, even with those courses removed, the results are nearly the same.

I summarized the findings of this analysis in the Regression Summary Table 4, which indicated that the model appears to be accurate for the samples and generalizable to the defense acquisition workforce. For all of the samples, *learning achieved* is the most important predictor of *applied training*; however, *task applicability* is also important in predicting the acquisition professional's ability to apply what was learned in acquisition policy training courses on the job. Functional topic and delivery method must be factored in when determining the importance of *resources provided* and *manager involvement* as additional predictors of *applied training*. The multiple regression assumptions appear to have been met, so this model should generalize to the acquisition workforce.

Table 4. Regression Summary—Predictors of Applied Training

Model		ACQ						BCF					
		ILT (*N*=1317)			SPW (*N*=1783)			ILT (*N*=646)			SPW (*N*=919)		
		B	Std. Error	Beta	*B*	Std. Error	Beta	*B*	Std. Error	Beta	*B*	Std. Error	Beta
1	(Constant)	-.076	.093		.021	.116		.088	.279		.281	.163	
	I learned new knowledge and skills from this training.	.962	.015	**.871***	.898	.020	**.735***	.872	.045	**.606***	.861	.028	**.716***
		***R*-squared = .759**			***R*-squared = .541**			***R*-squared = .367**			***R*-squared = .513**		
2	(Constant)	-.385	.083		-.022	.104		-.247	.240		.099	.153	
	I learned new knowledge and skills from this training.	.801	.015	**.725***	.657	.020	**.538***	.580	.041	**.403***	.640	.028	**.532***
	What percent of your total work time have you spent on tasks that require the knowledge/skills presented in the training?	.007	.001	**.146***	.014	.001	**.242***	.016	.002	**.280***	.015	.001	**.247***

Model		B	Std. Error	Beta	B	Std. Error	Beta	B	Std. Error	Beta	B	Std. Error	Beta
	I was provided adequate resources (time, money, equipment) to successfully apply this training on my job.	.142	.012	**.167***	.051	.016	**.056****	.207	.031	**.220***	.063	.024	**.064****
	After training, my manager and I discussed how I will use the learning on my job.	.043	.008	**.071***	.155	.013	**.201***	.087	.024	**.119***	.138	.019	**.183***
		***R*-squared Change = .067** *(*p* < .001)			***R*-squared Change = .122** *(*p* < .001) **(*p* < .01)			***R*-squared Change = .202** *(*p* < .001)			***R*-squared Change = .121** *(*p* < .001) **(*p* < .01)		

Note. Dependent Variable: I have been able to successfully apply the knowledge/skills learned in this class to my job.
DAU Follow-Up Surveys

Model		CM						CON					
		ILT (*N*=416)			SPW (*N*=297)			ILT (*N*=1624)			SPW (*N*=1894)		
		B	Std. Error	Beta	*B*	Std. Error	Beta	*B*	Std. Error	Beta	*B*	Std. Error	Beta
1	(Constant)	.514	.253		.934	.265		.350	.166		.471	.100	
	I learned new knowledge and skills from this training.	.884	.040	**.740***	.813	.043	**.737***	.871	.026	**.638***	.871	.017	**.770***
		***R*-squared = .547**			***R*-squared = .543**			***R*-squared = .638**			***R*-squared = .593**		
2	(Constant)	.162	.231		.840	.253		.225	.139		.319	.093	
	I learned new knowledge and skills from this training.	.672	.040	**.562***	.622	.054	**.564***	.569	.024	**.417***	.678	.018	**.600***
	What percent of your total work time have you spent on tasks that require the knowledge/skills presented in the training?	.009	.001	**.222***	.009	.002	**.208***	.013	.001	**.284***	.010	.001	**.205***
	I was provided adequate resources (time, money, equipment) to successfully apply this training on my job.	.130	.035	**.149***			**Not Sig.**	.207	.031	**.213***	.019	.249	**.077***
	After training, my manager and I discussed how I will use the learning on my job.	.069	.025	**.105****	.139	.029	**.203***	.045	.013	**.067****	.089	.011	**.130***
		***R*-squared Change = .103** *(*p* < .001) **(*p* < .01)			***R*-squared Change = .090** *(*p* < .001) **(*p* < .01)			***R*-squared Change = .198** *(*p* < .001) **(*p* < .01)			***R*-squared Change = .078** *(*p* < .001) **(*p* < .01)		

Note. Dependent Variable: I have been able to successfully apply the knowledge/skills learned in this class to my job.
DAU Follow-Up Surveys

Model		ENG						LOG					
		ILT (*N*=726)			SPW (*N*=2148)			ILT (*N*=1196)			SPW (*N*=2033)		
		B	Std. Error	Beta	*B*	Std. Error	Beta	*B*	Std. Error	Beta	*B*	Std. Error	Beta
1	(Constant)	.289	.178		.316	.091		-.087	.179		-.127	.097	

	I learned new knowledge and skills from this training.	.861	.030	**.727***	.864	.016	**.764***	.909	.029	**.674***	.923	.017	**.768***
		R-squared = .528			**R-squared = .584**			**R-squared = .455**			**R-squared = .590**		
	(Constant)	.126	.169		.207	.086		-.122	.148		-.114	.088	
	I learned new knowledge and skills from this training.	.634	.030	**.535***	.631	.017	**.558***	.552	.027	**.409***	.655	.018	**.545***
	What percent of your total work time have you spent on tasks that require the knowledge/skills presented in the training?	.015	.001	**.278***	.013	.001	**.223***	.019	.001	**.327***	.015	.001	**.228***
2	I was provided adequate resources (time, money, equipment) to successfully apply this training on my job.	.104	.025	**.107***	.071	.014	**.073***	.185	.022	**.190***	.030	.015	**.030***
	After training, my manager and I discussed how I will use the learning on my job.	.077	.018	**.110***	.135	.011	**.181***	.095	.016	**.126***	.189	.013	**.228***
		R-squared Change = .120 *($p < .001$) **($p < .01$)			**R-squared Change = .101** *($p < .001$) **($p < .01$)			**R-squared Change = .197** *($p < .001$) **($p < .01$)			**R-squared Change = .119** *($p < .001$) **($p < .01$)		

Note. Dependent Variable: I have been able to successfully apply the knowledge/skills learned in this class to my job.
DAU Follow-Up Surveys

Model		PMT						PQM					
		ILT (N=338)			SPW (N=548)			ILT (N=476)			SPW (N=746)		
		B	Std. Error	Beta	*B*	Std. Error	Beta	*B*	Std. Error	Beta	*B*	Std. Error	Beta
	(Constant)	1.528	.374		.450	.166		.240	.270		.245	.172	
1	I learned new knowledge and skills from this training.	.690	.058	**.541***	.875	.028	**.799***	.884	.043	**.683***	.877	.029	**.744***
		R-squared = .293			**R-squared = .638**			**R-squared = .467**			**R-squared = .554**		
	(Constant)	.681	.341		.102	.163		-.206	.222		.075	.164	
	I learned new knowledge and skills from this training.	.496	.055	**.388***	.714	.029	**.652***	.605	.038	**.468***	.675	.030	**.573***
2	What percent of your total work time have you spent on tasks that require the knowledge/skills presented in the training?	.014	.002	**.338***	.010	.001	**.204***	.013	.001	**.269***	.011	.001	**.201***

I was provided adequate resources (time, money, equipment) to successfully apply this training on my job.	.180	.046	**.182***	.075	.025	**.080****	.244	.030	**.285***	.065	.026	**.066*****
After training, my manager and I discussed how I will use the learning on my job.	.053	.025	**.092*****	.088	.018	**.136***		**NOT SIG.**		.126	.019	**.177***
	***R*-squared Change = .199** *(p < .001) ***(p < .05)			***R*-squared Change = .077** *(p < .001) **(p < .01)			***R*-squared Change = .210** *(p < .001)			***R*-squared Change = .099** *(p < .001) ***(p < .05)		

Note. Dependent Variable: I have been able to successfully apply the knowledge/skills learned in this class to my job. DAU Follow-Up Surveys

Model		STM						TST					
		ILT (*N*=182)			SPW (*N*=0)			ILT (*N*=212)			SPW (*N*=257)		
		B	Std. Error	Beta	*B*	Std. Error	Beta	*B*	Std. Error	Beta	*B*	Std. Error	Beta
	(Constant)	.680	.347					.247	.413		.734	.324	
1	I learned new knowledge and skills from this training.	.811	.059	**.714***				.873	.068	**.661***	.788	.055	**.670***
		***R*-squared = .510**			**No SPW Classes**			***R*-squared = .437**			***R*-squared = .449**		
	(Constant)	.304	.326					.325	.368		.255	.312	
	I learned new knowledge and skills from this training.	.608	.059	**.536***				.530	.070	**.401***	.604	.055	**.514***
	What percent of your total work time have you spent on tasks that require the knowledge/skills presented in the training?	.011	.003	**.216***				.014	.002	**.281***	.015	.002	**.288***
2	I was provided adequate resources (time, money, equipment) to successfully apply this training on my job.	.166	.047	**.192****				.148	.055	**.152****		**Not Sig.**	
	After training, my manager and I discussed how I will use the learning on my job.		**Not Sig.**					.129	.037	**.187****	.116	.033	**.163****
		***R*-squared Change = .129** *(p < .001) **(p < .01)						***R*-squared Change = .166** *(p < .001) **(p < .01)			***R*-squared Change = .136** *(p < .001) **(p < .01)		

Note. Dependent Variable: I have been able to successfully apply the knowledge/skills learned in this class to my job. DAU Follow-Up Surveys

Interpretation of Findings

This study found DAU training to be a key contributor to implementing defense acquisition change by driving policy-compliant behavior change in the defense acquisition workforce. I interpreted the findings from the two-part study in the context of the behavior-before-belief model of culture change (Table 1). The first stage of the behavior-before-belief model is unfreezing the organization by creating the motivation to change. The literature strongly supports that defense acquisition problems, fiscal crises, and complex, rapid environmental changes are driving the need for culture change in the defense acquisition workforce (Edison & Murphy, 2012; Eide & Allen, 2012; Gates, 2010; Kratz & Buckingham, 2010; Lee, 2013; Masciulli, 2011). For DoD leadership and personnel, my review of the literature has shown that the motivation to change exists, which should unfreeze the status quo and prepare the organization to start the process of developing new cultural assumptions (Schein, 2010). Strategic management efforts used by DoD and other organizations to drive change through policy change planning and implementation were also well supported in the literature (Boyne & Walker, 2010; Bryson, 2011; Burke, 2011; Linn, 2008; Poister, 2010; Wedel et al., 2005).

The second stage in the behavior-before-belief model is cognitive restructuring through learning new concepts, new meanings for old concepts, and new judgment standards. The organization and culture change literature supports the use of training to facilitate behavioral change (Bontis et al., 2011; Burke, 2011; Bryson, 2011; Eide & Allen, 2012; Knowles, 1980; Kotzian, 2010; Ng'ang'a & Otii, 2013; Nissen, 2012). The literature also strongly suggested that transformational, collaborative, active-learning strategies enhance learning and the likelihood of change success (Bass & Riggio, 2010; Beattie, Thornton, & Laden, 2013; Boyne & Walker, 2010; Burns, 2010; Eide & Allen, 2012; Kotzian, 2010; O'Neil, 2011; Rendon, Apte, & Apte, 2012; Stevens et al., 2010). All DAU training courses teach complex defense acquisition policies and best practices tailored to the functional topic. Part 1 of the study tested whether Stage 2, cognitive restructuring, occurred by students learning new concepts in DAU policy training courses and determined the predictors of learning. Part 2 of the study tested whether Stage 3 of the change model occurred by examining students' on-the-job application of new behaviors learned following DAU policy training courses. Part 2 of the study also tested for the predictors of the students' ability to apply new concepts learned in training after the students had returned to the workplace.

Summary of Key Findings

This study found that students learned new concepts in all DAU policy training courses and that the most important predictor of *learning achieved* is *career benefit*, meaning that how beneficial the training is to the acquisition professional's career drives learning of new concepts in all DAU course types. Whether the training was a worthwhile investment for the employer was also a significant predictor of learning. These findings support the Bontis et al. (2011) study that found the worthwhile investment construct, which combined benefit to the student's career and employer, to be the most significant predictor of individual learning for DAU courses. This means that important factors in students' learning the defense acquisition policy and best practices taught in DAU courses are how worthwhile the training is to their career and employer.

The study also found that for resident courses, the *exercises value* variable was a highly significant predictor of *learning achieved*. The *exercises value* variable is a measure of the learning value of collaborative, scenario-based, team exercises that provide students with hands-on experience in applying acquisition policy to real-world problems. This predictor was less important for online SPW courses, likely due to the absence of collaborative teaming experience in addressing scenario-based problems presented in training. The study found that conditional relationships exist between the predictor variables *examples helped*, *instructor enthusiasm*, *application discussed*, *instructor knowledge*, *delivery effective*, and *graphics meaningful* and the outcome, *learning achieved*, dependent on course type.

The study also confirmed that application of concepts learned from DAU training occurs in the defense acquisition workplace and that the most important predictor of this application of learning was the *learning achieved* variable, which measured whether the student learned new knowledge and skills from the DAU training. This variable was found to be a highly significant predictor and the most important predictor of the *applied training* outcome for all DAU courses, accounting for greater than 50% of the variability in the *applied training* outcome for most courses. Increasing learning achieved in DAU training increases application of the policy-compliant behavior learned in the defense acquisition workplace. These findings support acceptance of the research hypothesis that there is a highly significant positive correlation between *learning achieved* and *applied training* and that *applied training* can be predicted from *learning achieved* for all DAU training courses. Application of learned concepts from DAU policy training was the policy-compliant behavior change tested; therefore, this study found that the DAU training does enhance policy-compliant behavior of the DoD acquisition workforce personnel.

Another highly significant predictor of *applied training* for all DAU courses was the *task applicability* variable, which measured the percentage of total work time spent on tasks that required the knowledge/skills presented in the training. This finding indicates that to increase application of training on the job, the DoD needs to ensure that the personnel who can use the training on the job are the personnel who are given the training. This variable also supports the worthwhile construct and adds further support to the importance of "having the right butts in seats" in DAU courses to increase policy-compliant behavior in the defense acquisition workplace. Conditional relationships exist between *resources provided* and *manager involvement* and the outcome, *applied training*, dependent on the type of course.

Conclusion

In the DoD, transformative change is implemented across the acquisition workforce in part by DAU training to enhance understanding of acquisition policy and best practices and to facilitate policy-compliant behavior in the defense acquisition military and civilian workforce. The findings from Part 1 of the study (Table 3) confirmed that the second stage in the behavior-before-belief model for culture change (Table 1) took place in DAU training. These findings showed that cognitive restructuring through learning new concepts, new meanings for old concepts, and new judgment standards occurred during DAU scenario-based training of cross-functional teams. These findings further confirm the knowledge found in the literature that suggests that transformational, collaborative, active-learning strategies enhance learning.

The findings from Part 2 (Table 4) of the study confirmed that the third stage in the behavior-before-belief model for culture change (Table 1) took place following DAU training. These findings showed that students applied the new behaviors learned following DAU training courses and determined important predictors of the students' ability to apply these new concepts after the students had returned to the workplace. The findings from this study confirm that use of training facilitates behavioral change and that transformational, collaborative strategies enhance the likelihood of change success. Learning achieved in policy courses predicted application on-the-job of behaviors learned. If the new behaviors correct problems and produce better outcomes, then culture change as described in Stage 4 of the behavior-before-belief model (Table 1) should occur (Schein, 2010).

The study results extend knowledge by providing a better understanding of policy change implementation in the DoD, using DAU training to facilitate policy-compliant behavior change that should lead to needed culture change. For each DAU course type, the findings provide key drivers of learning and behavior change following DAU courses. Further confirming knowledge found in the literature, the results indicate that once the value to the student and employer is established, the greatest learning and behavior change occurs following resident courses that provide collaborative teaming experiences not found in online courses. These findings confirm that transformative, collaborative training techniques provided in a psychologically safe training environment facilitate behavioral change required to enhance the likelihood of successful implementation of complex policy changes, as suggested by the literature (Bass & Riggio, 2010; Boyne & Walker, 2010; Hackman, 2010; Kotzian, 2010; Masciulli, 2011; Schein, 2010; van Eeden, Cilliers, & van Deventer, 2008).

The literature provides that environmental change has been accelerated by globalization and technology, requiring transformative culture change to adapt. Changes in culture, or tacit assumptions, of mature organizations like the DoD cannot, in all likelihood, be successfully implemented and institutionalized directly; however, behavior can be changed by leaders to drive culture change (Burke, 2011; Schein, 2010). DAU training is required for all defense acquisition workforce personnel, so behavior change across the workforce should facilitate Stage 4 of the behavior-before-belief model, which is refreezing, or internalizing the new concepts, meanings, and standards in the defense acquisition workforce. This means that the DoD's efforts to implement complex defense acquisition policy changes should be successful using DAU training to address the complexity of the acquisition processes involved, the hyper-turbulent environment, and the change-resistant culture of the DoD acquisition workforce. This study established that a positive relationship exists between training and policy-compliant behavior; therefore, training is likely an effective contributor to policy change implementation in the DoD's defense acquisition workforce.

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