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Corresponding author  
E-mail: [byong3@hanmail.net](mailto:byong3@hanmail.net)

Peer reviewer  
E-mail: [editor@j-institute.jp](mailto:editor@j-institute.jp)

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## Factors Affecting KOREA ARMY Officers' Achievement in Professional Development Education

Jung Byong-sam

*Korea Army Academy at Yeongcheon, Yeongcheon, Republic of Korea*

### Abstract

*The purpose of this study is to identify the person and class level factors and class level factors significantly affect the students' academic achievement in the military professional development education. Total 695 military officers were sampled and were administered a battery of questionnaires in April 2015. The sampled officers were in the officer advanced course of 9 army branch schools and they belonged to 33 classes. The data were analyzed in hierarchical linear modeling because the data structure was multilevel with personal and classroom level. The dependent variable was the officers' grade level and a multinomial logit model was applied. The grade level was classified into three kinds (A, B, and C) and the student officers received Grade B served as reference group. The results suggested that the college graduation status was not significant because most of the military officers had bachelor degree so there was not much variance in the grade classification caused by the college graduation status. Second, learning motivation is the psychological energy that a learner starts and ends their studying behavior. In many studies, learning motivation was proven to be a strong indicator of a learner's academic achievement. Learning motivation was significant to separate Grade B from C, however, it was not significant to separate Grade A from B. There was big difference in the variance in the learning motivation between learners of Grade B from Grade C, however, there was no significant difference in the variance in the learning motivation between learners of Grade A and B. Meanwhile, learning strategy turned out to be significant both to separate Grade B from C, and Grade A from B. Many learners who make effort to store, retrieve, and apply to their learning assignment gain better grade than learners who do not know the way to apply the strategy. The results also indicate that the instructors must teach their student not only the class contents but also the learning strategy to improve their learning accomplishment. Study time is also significant to classify the Grade A from B, B from C in the personal and class-level and the result indicates that learning strategy itself is necessary but not enough to improve a learner's grade level. Logical teaching style positively separate the Grade B from C, A from B and the result means that logical instructors clearly point out a learner's strength and weakness. The honest feedback and direct guideline are effective to improve the military officers' accomplishment. The military schools must apply the results when they train their instructors. Learning motivation is the psychological energy that a learner starts and ends their studying behavior. In many studies, learning motivation was proven to be a strong indicator of a learner's academic achievement. Learning motivation was significant to separate Grade B from C, however, it was not significant to separate Grade A from B because there was big difference in the variance in the learning motivation between learners of Grade B from Grade C, however, there was no significant difference in the variance in the learning motivation between learners of Grade A from B. Meanwhile, learning strategy turned out to be significant both to separate Grade B from C and Grade A from B. Many learners who make effort to store, retrieve, and apply to their learning assignment gain better grade than learners who do not know the way to apply the strategy. The results also indicate that the instructors must teach their student not only the class contents but also*

*the learning strategy to improve their learning accomplishment. Study time is significant to classify the Grade A from B, B from C in the personal and class-level and the result indicates that learning strategy itself is necessary but not enough to improve a learner's grade level.*

**[Keywords]** *Army Officer, Professional Development Education, Achievement, Multilevel Analysis, Learning Strategy*

## 1. Introduction

All military officers are obliged to complete the professional development education(PDE) programs like officer basic course(OBC), officer advanced course(OAC), and Joint Staff College(JSC) according to their ranks. Those PDE programs facilitate the officers' competencies for their job and the positive effects brings progress of defense power[1]. Jung(2015) empirically demonstrated the significance of the PDE on the Republic of Korea Army(ROKA) officer's job satisfaction and job competency[2]. He applied CIPP(Context-Input-Process-Product) model to prove the officers' perceived work proficiency through the PDE. There have been only few studies attempted to empirically prove the effect of PDE in the military context this study intended to demonstrate the effect.

Researchers in the area of continuing professional development have been attempting to identify the factors affecting the achievement in the PDE in educational context, and most of the factors related the outcome are group and individual character variables[3]. Researchers suggested that motivation, service tenure, learning strategy, study time are representative individual variables, and group atmosphere, instructor behavior, classroom management, and feedback types are group variables affecting the outcomes of the PDE[4].

As mentioned above, the variables affecting the academic achievement of PDE have a multi-level structure and that requires multi-level analysis(MLA) method to identify the complicated relationship among the variables. The MLA has advantages in explaining the variance of multiple layers and in dividing the explanatory ratio of variance including interaction among the variables[5]. In

the usual educational context, each learner belongs to his or her group while having individual characteristics, and each group also has its own characteristics. Individuals, therefore, are influenced by both the personal and group characteristics. Military organizations, especially, has hierarchical attributes and relatively stronger group influence than individual characteristics[6].

This study, therefore, could identify the influence of individual and group variables on the military officers' academic achievement in the PDE. The results of this study would contribute to advancement of PDE in the aspects of recruit and training of instructor. The research questions to accomplish the research purpose are like below:

First, what are the significant individual variables affecting the academic achievement in the military officers' PDE?

Second, what are the significant group variables affecting the academic achievement in the military officers' PDE?

## 2. Theoretical Background

### 2.1. Concept and importance of PDE

PDE is a pre-commissioning training program focusing on knowledge, skill, and attitude(KSA) of the specific job area[7]. Professionalism is more emphasized in the job area like medicine, law, and education as they require long and intensive education is required. Professionals in those area have to acquire up-to-date KSA to maintain their expertise and vocational identity[8].

PDE is needed for the professionals to conduct their job duties and to create new values in their job. Since pre-service education is not satisfactory to give a novice full

KSA to meet the clients' demand, a beginner of a professionalism has to complete the PDE to expand his or her competence[9]. New KSAs are produced every day, so the professionals have to absorb the new KSAs to develop their vocational identity[10]. In addition, the professionals' internal re-composition of their vocational identity is also required to progress their professionalism[11].

Learners in the PDE experience complex interaction with instructors, peers, and staffs over the course of the training including cooperation, renovation, or conflicts[12]. Professional competency, therefore, is formed not only by personal factors like effort or attribute but also by interaction with peers, instructors' behaviors, and institutional supports. Military officers, especially, need to involve in on-the-job trainings to increase their expertise, and they also need to involve in the professional community with the peers' support and in information[13].

## **2.2. Personal and group factors affecting the academic achievement in PDE**

Literature reveals that individuals' cognitive characteristics, instructors' behavior, relationship with peers, and classroom atmosphere significantly affect the learners' accomplishment in the PDE[14]. In the personal level, schooling is an important predictor of academic accomplishment and satisfaction[15]. In addition, tenure status(long-term service) is an index of job competence and motivation[16]. Third, learning motivation, the strength of will to study, also affect the academic accomplishment in the military and civilian education[17]. Fourth, learning strategy is a cognitive way to efficiently store and retrieve to solve problems and it significantly affects the learners' academic accomplishment.

It has been known that instructors' teaching strategy has strongest influence on the academic accomplishment among the group factors[18]. Teaching strategy is the main method that an instructor use during his or her class, and it affects the learners' satisfaction and accomplishment. Instructor's

leadership, in addition, has significant effect on the learners' accomplishment and satisfaction, which determines classroom atmosphere either cooperative or competitive.

The cooperative atmosphere is characterized that learners help each other in their academic assignment and give positive feedback to each other to solve their problems harmoniously. The competitive atmosphere, in contrast, is characterized that students hardly help or interact in positive way for other learners[19].

Lastly, rubrics which is an explanatory manual for homework assignments also showed positive influence on the learners' academic achievement. Military officers, especially have to do a lot of assignments in a short time in their PDE, so they need rubrics to solve the assignments[20] as fast as possible.

## **3. Research Method**

### **3.1. Subjects**

The subjects of this study were 695 Korea Army officers who were studying at 9 army branch schools for their Officer Advanced Course(OAC). The subjects belonged to 33 classes as a group level. The branch schools adopt the 'instructor-in-charge' system that an instructor not only teaches his or her class students academic subjects but also discipline them after classes as a disciplinary officer. That is a kind of apprenticeship system magnifying the importance of influence of classroom-level activity on the classroom atmosphere and accomplishment.

In the classroom level, most of the units belonged to combat branches(for examples, infantry, artillery, armor, and intelligence)(n=20, 60.6%), 9 units(27.3%), belonged to technical branches, and only 4 units(12.1%) belonged to administrative branches. The major subjects had long-term service tenure(58.7%) while minor subjects had short-term tenure(41.3%).

A battery of survey questionnaires was administered to the subject from April 5, 2015 to April 8, 2015. The researchers

visited each branch school under permission of the superintendents for the survey and interview.

### 3.2. Variables and research model

This study intends to identify the significant factors affecting the academic accomplishment of the learners in personal and group levels. The results are classified into the two levels.

Academic grade(A, B, or C) is the dependent variable, and the grade is determined by relative ratio of the students' accomplishment. The grade is finalized based on the students test scores, performance evaluations, and their physical test scores. In sum, 29.5% of the subjects received A, 42.3% of them B, and 28.2% of them C.

There are five personal level independent variables analyzed in this study: College graduation status, tenure status, learning motivation, learning strategy, and study time. First, college graduation status was dummy coded into two numbers: 1 represented that a student graduated from a four-year college with a bachelor degree while 0 meant that a student did not have a bachelor degree. Second, tenure status was also dummy coded into two numbers: 1 represented that a student had the long-term service tenure while 0 represented that a student was not qualified the long-term tenure. Third, the learning strategy is a continuous variable coded with Likert-type scale used the Learning Strategy Scale(LSS) including intrinsic type, extrinsic type, and social type. The reliability coefficient of the measure was Cronbach's alpha .89 which was quite decent. Fourth, the learning strategy was measured by the questionnaire of Motivated Strategy for Learning(MSLQ) which was developed by Pintrinch[21]. The measure was consisted of three sub-scales of cognitive strategy, regulation strategy, and behavioral strategy with 9 items demonstrating the reliability coefficient of Cronbach alpha .90. Lastly, the study time was measured by the self-report scale the requires the respondents to record the exact time they spend in their study.

#### 3.2.1. Group-level independent variables

There are five independent variables in the group-level: instructional type, instructor's feedback, instructional strategy, rubrics, and cooperative atmosphere. First, instructional type is a scale measuring an instructor's teaching behavior with likert-type five-point scale. The teaching style survey demonstrated the reliability coefficient of Cronbach alpha .91. Second, instructor feedback was measured by the students' self-report scale about the frequency and concreteness of the instructor's feedback. The instructor feedback scale showed a decent reliability coefficient of Cronbach alpha .88. Third, teaching strategy was measured by the questionnaire of instructor teaching behavior(TBQ) developed by Jung[22] and it demonstrated acceptable reliability coefficient of Cronbach alpha .86. Fourth, the quality of rubrics was measured by a self-report questionnaire of Jung[23] and showed the reliability coefficient of Cronach alpha .87. Lastly, the cooperative atmosphere was measured by the Supportive Problem Solving Inventory(PSPI). It consists of 6 items assessing involvement, help-offering, and action. PSPI demonstrated decent construct validity(CFI=.92, TLI=.90) and reliability (Cronbach alpha .84).

#### 3.2.2. Hypothesized model

The dependent variable of this study is military officer students' academic achievement in PDE and the personal level independent variables are college status, tenure status, learning motivation, learning strategy, and study time. Independent variables of classroom level, in addition, are instructional type, teacher feedback, instructional strategy, rubrics, and cooperative atmosphere.

The baseline model consisted of only intercept while hypothesized model I has personal level independent variables and model II has group level independent variables over and above the personal level variables. The data were analyzed by multinomial logistic multilevel analysis. The equation model of the analysis is like below:

$$\phi_{Mij} : Y = M$$

$$\phi_{3ij} = 1 - \phi_{Aij} - \phi_{Bij} - \phi_{Cij}$$

$$\eta_{Mij} = \log\left(\frac{\phi_{Mij}}{\phi_{3ij}}\right) M = A, B,$$

$$\text{Level1: } \eta_{Mij} = \beta_{0j(M)} + \beta_{1j(M)}X_{1ij} + \dots + \beta_{pj(M)}X_{pj}$$

$$\text{Level2: } \beta_{0j(M)} = \gamma_{00(M)} + \gamma_{01(M)}W_{1i} + \dots + \gamma_{0d(M)}W_{di(M)}; u_{0i} \sim N(0, \tau_{00})$$

Level 1 equation means the grade of academic achievement is the dependent variable and the personal level independent variables explain the variance of grade. The grade is classified into three levels (A, B, and C), and the group received the grade B served as a reference group in the equation. The equation calculates the odd ratio of other groups receive the grade of other than B and the equation also output the two multinomial Logit equations. All data set were analyzed in the program of HLM7.0 and the parameters were estimated by multiple imputation[24].

## 4. Results

### 4.1. Factors separating grade B from C

#### 4.1.1. Personal level variables

The tenure status, learning motivation, learning strategy, and study time were significant to separate the Grade C from Grade B. First, tenure status ( $\beta=.39$ ,  $p<.001$ ,  $OR=1.75$ ) significantly separated Grade C from Grade B, second, learning motivation ( $\beta=.54$ ,  $p<.001$ ,  $OR=2.44$ ) was significant to divide Grade C from grade B. Third, learning strategy ( $\beta=.49$ ,  $p<.001$ ,  $OR=1.87$ ) and study time ( $\beta=.21$ ,  $p<.05$ ,  $OR=1.24$ ) also significantly separate Grade C from Grade B.

#### 4.1.2. Class level variables

Facilitative teaching style ( $\beta=.21$ ,  $p<.05$ ,  $OR=1.24$ ) was significant as a class-level variable to separate Grade C from Grade B and feedback ( $\beta=.31$ ,  $p<.01$ ,  $OR=2.76$ ), instructional strategy ( $\beta=.22$ ,  $p<.05$ ,  $OR=1.15$ ), rubrics ( $\beta=.20$ ,  $p<.05$ ,  $OR=1.30$ ), and cooperative atmosphere ( $\beta=.25$ ,  $p<.01$ ,  $OR=1.78$ ) also significantly separated the Grade C from Grade B as class-level variables.

The results of the analysis mean that facilitative teaching style positively affected the academic achievement; if the score of facilitative teaching style goes up as much as 1 point, the odd that a learner's grade would be B rather than C goes up as much as 1.5 times. In addition, if the instructional strategy goes up 1 point, the odd that a learner's grade would be B rather than C goes up as much as 1.2 times.

### 4.2. Factors separating grade A from grade B

#### 4.2.1. Personal-level variables

Learning strategy ( $\beta=.28$ ,  $p<.01$ ,  $OR=2.09$ ) was significant to separate Grade A from B as a personal-level variable and it means if the score of learning strategy goes up 1 point, the odd that the grade would be A rather than B goes up as much as 2.09 times. In addition, the study time ( $\beta=.20$ ,  $p<.05$ ,  $OR=1.87$ ) positively affected the odd that the grade would be A rather than B, and if the 1 point of study time goes up, the odd that the grade would be A rather than B goes up 1.87 times.

#### 4.2.2. Class-level variables

Logical teaching ( $\beta=.21$ ,  $p<.05$ ,  $OR=2.24$ ), facilitative teaching ( $\beta=.22$ ,  $p<.01$ ,  $OR=2.09$ ), feedback ( $\beta=.28$ ,  $p<.01$ ,  $OR=1.98$ ), and rubrics ( $\beta=.21$ ,  $p<.01$ ,  $OR=1.86$ ) positively affected the odd that a learner's grade would be A rather than B. All four variables positively affected the odd that a learner's grade would be A rather than B. If 1 point of logical teaching, facilitative teaching, feedback, and rubrics goes up, the odd that a learner's grade would be A rather than B goes up 2.24, 2.09, 1.98, and 1.86 times respectively.

## 5. Discussion

The purpose of this study is to identify the person and class level factors that significantly affect the student officers' academic achievement in the PDE. Total 695 military officers were sampled and were administered a battery of questionnaires in April 2015. The officers were in the officer ad-

vanced course of 9 army branch schools and belonged to 33 classes. The data were analyzed in hierarchical linear modeling because the data structure was multilevel with personal and classroom level. The dependent variable was the officers' grade level and a multinomial logit model was applied. The grade level was classified into three kinds (A, B, and C), and the group received Grade B served as a reference group.

The results suggested that the college graduation status was not significant because most of the military officers had bachelor degree, so there was not much variance in the grade classification caused by the college graduation status. Learning motivation is the psychological energy that a learner starts and ends their studying behavior. In many studies, learning motivation was proven to be a strong indicator of a learner's academic achievement. Learning motivation was significant to separate Grade B from C, however, it was not significant to separate Grade A from B because there was a big difference in the variance in the learning motivation between learners of Grade B from Grade C, however, there was no significant difference in the variance in the learning motivation between learners of Grade A from B.

Meanwhile, learning strategy turned out to be significant both to separate Grade B from C, and Grade A from B. Many learners who make effort to store, retrieve, and apply to their learning assignment gain better grade than learners who do not know the way to apply the strategy. The results also indicate that the instructors must teach their student not only the class contents but also the learning strategy to improve their learning accomplishments. Study time is significant to classify the Grade A from B, B from C in the personal and class-level, and the result indicates that learning strategy itself is necessary but not enough to improve a learner's grade level if the learner does not spend much time to study.

Logical teaching style is significant to separate the Grade B from C, A from B, and the result means that logical instructors clearly point out a learner's strength and weakness.

The honest feedback and direct guideline are effective to improve the military officers' accomplishment. The military schools must apply the results when they train their instructors to interact with student officers in the class.

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### Author

**Jung Byong-sam** / Korea Army Academy at Yeongcheon Professor

B.A. Korea Army Academy at Yeongcheon

M.A. Yonsei University

Ph.D. University of Virginia

### Research field

- Effect of Military Academy's Writing Course for Military Cadets' Writing Proficiency, International Journal of Military Affairs, 2(1) (2017).

- Character Education for Military Cadets of Korea Army Leaders of National Safety, International Journal of Crisis & Safety, 2(3) (2017).

### Major career

- 2010~present. Korea Army Academy at Yeongcheon, Professor.

- 2016~present. International Society for Military Affairs, Editor in Administrator.