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The Structural Relationships among Creative Learning Self-Efficacy, Academic Adaptation, and Career Maturity of Aeronautics Students

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Abstract

The purpose of this study was to investigate the structural relationships among creative learning self-efficacy, academic adaptation, and career maturity of aeronautics major students. A total of 207 college students (freshmen through senior) of H University in Korea participated in this study. Correlation analysis and test of structural model fits were performed by using SPSS 23.0 and AMOS 22.0. First, the results of the comparison across the grade level showed that there were increasing tendencies of scores of creative learning efficacy, academic adaptation, and career maturity measures. Second, there were statistically significant correlations among creative learning efficacy, academic adaptation, and career maturity of aeronautics major students. Third, the result of the path and model fit tests showed that all the model fit indices of χ2/df, TLI, CFI, RMSEA were met the acceptable criteria, and shown to be a suitable model structure. The significance and implications of this study were provided.

Keywords: *Creative learning self-efficacy, Academic adaptation, Career maturity, Aeronautics students*

1. Introduction

Since Bandura's (1977) introduction of the concept of self-efficacy, many education researchers have investigated the role of this variable plays in the various aspects of human lives at varying age levels. Further, this general level of construct has expanded to various domain specific settings in need of accounting specific valid context, for example, academic self-efficacy, learning skill efficacy, math-efficacy, creative self-efficacy, creative learning efficacy, career decision and maturity efficacy, and many other job-related efficacies (Bandura, 1990; Beghetto, 2006; Bong, 2002; Kang, 2009; Kim, 2004; Kim, 2009; Oh, 2002; Lee, 2014; Lee & Choi, 2016; Owen, 1991; Park & Chae, 2005; Tierney & Farmer, 2002) These beliefs in context of academic settings directly and indirectly influence not only to academic achievement (Bandura, 1997; Schunk, 1996; Zimmerman, 2000) but also to cognitive, motivational, affective, and decisional processes (Bandura, 1986, 1997; Pintrich & De Groot, 1990; Pajares & Miller, 1994) It plays a crucial role in individual growth as directs a person's life theme like the activities, interests, controls over functioning and environmental demands.

In these streams of self-efficacy researches, Lee (2016) proposed creative learning self-efficacy which consist with creative study, thinking, and problem solving efficacies influence

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school life adjustment, task involvement behavior, academic adjustment, and job-related performance. Beghetto (2006) and Tierney & Farmer (2002) also suggested that creative efficacy plays an important role in predicting job performance, further students who shows high creative learning self-efficacy tended to adjust school life better, select challenging task, and make much efforts for success (Yoo, 2005; Kim, 2001) According to Kim's (2000) study the academic adjustment consists of college environment, class, college life, and academic achievement as sub-factors. Therefore, as previously described self-efficacy affects to academic performance and school adjustment, it is expected that creative academic self-efficacy can influence academic adjustment. Many other researchers (Jo, 2007; Kim, 2000; Moon & Sim, 2001; Oh & Lee, 2001) have demonstrated that self-efficacy functioned as direct and indirect effect on career preparation, career decision, career commitment, and career maturity. Taylor & Betz (1983) included self-directed, academic motivation, self, problem solving maturity factors for the career maturity construct.

To sum up these research findings, it is predicted that creative learning self-efficacy will impact on career maturity, and academic adjustment will show mediating effect between these two variables aeronautics major students. In an era of 4th industrial revolution, aeronautics education institutes emphasize not only to establish the creativity competency and professions in aeronautic career and successful academic adjustment but also recognize the necessity of the intervention program and evidence-based research to facilitate creative learning self-efficacy and career maturity for college students. It is very important and meaningful to cultivate students' creative learning efficacy may promote students' academic adjustment, and also benefit for promoting the quality their career maturity in ultimate sense. The research questions of this study were as follows: 1. Are there statistically significant correlations among measured variables? 2. Can the hypothesized model explain the relationship among creative learning efficacy, academic adjustment, and career maturity of aeronautics major students? 3. Does academic adjustment play a mediating role between creative learning efficacy and career maturity of aeronautics major students?

2. Method

2.1. Participants

A sample of 207 aeronautics major students from H University is the only one has aeronautics major in Korea participated in this study. Sample consists of 12 female (5.8%) and 195 male (94.2%), and 156 freshman (75.4%), 30 sophomore (75.4%), 21 senior (10.1%)

2.2. Measures

2.2.1. Creative learning efficacy scale

Creative Learning Self-Efficacy Scale (CLSES) developed by Lee(2015) was used, this scale consists of 20 items, including three sub-factors, creative study (7 items), creative thinking (6 items), and creative problem solving (7 items) Each item is 5-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. The reliability Cronbach α of the scale was .947, and sub-factors' α were .890, 880, and .871 vice versa

2.2.2. Academic adjustment scale

Academic Adaptation Scale (AAS) developed by Kim (2000) was used, this scale consists of 20 items, including four sub-factors, college environment (5 items), class (5 items), college life (5 items), and academic achievement (5 items) Each item is 5-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. The reliability Cronbach α of the AAS was .946, and sub-factors' α were .787, .786, .884, and .791 in order.

2.2.3. Career maturity scale

Career Maturity Scale (CMS) was modified in this study based on Taylor & Betz's (1983) Career Decision-Making Scale (CDMS) CMS consists of 32 items, including four sub-factors, self-directed (8 items), academic motivation (8 items), self (8 items), and problem solving (8 items) Each item is 5-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. The reliability Cronbach α of CMS was .958, and sub-factors' α were .858, .826, .867, and .835 in order.

2.3. Data analysis

The data were analyzed using SPSS 23.0 and AMOS 22.0. First, descriptive statistics and Pearson correlation analyses were performed. Second, model fit test utilizing Structural Equation Modeling (SEM) was assessed by Maximum Likelihood (ML) method. The Tucker-Lewis index (TLI), the Comparative Fit Index (CFI), and the Root-Mean-Square Error of Approximation (RMSEA) were assessed as model fit indices. In order to examine mediation effect, Sobel test was performed.

3. Results

3.1. Descriptive statistics and pearson correlations

The results of descriptive statistics and Pearson correlation analyses showed as [Table 1>]and [Table 2].

Table 1. Descriptive statistics, skewness and kurtosis

Variable	M	SD	Skewness	Kurtosis
1. creative study efficacy	3.668	.6876	.209	-.421
2. creative thinking efficacy	3.547	.7364	.164	-.401
3. creative problem solving efficacy	3.712	.6238	.170	-.303
4. environmental adaptation	3.924	.6680	-.281	-.383
5. class adaptation	3.828	.6996	-.152	-.348
6. college life adaptation	3.798	.8096	-.418	.004
7. academic achievement adaptation	3.707	.7024	-.050	-.121
8. self directed maturity	4.037	.6672	-.311	-.705
9. achievement motivation maturity	3.948	.6331	-.057	-.580
10. self belief maturity	4.017	.6333	-.040	-1.097
11. problem solving maturity	3.904	.6476	.018	-.717

Each measured variable showed the ranges from -.418 to .209 for skewness and from -1.097 to .004 for kurtosis which satisfied the normal distribution criteria (Skewness < |2|, and Kurtosis < |4|) As shown [Table 2], there were statistically significant correlations between creative learning self-efficacy and academic adjustment (r = .606, p < .01), career maturity (r = .580, p < .01), and correlation between academic adjustment and career maturity was r = .728 (p < .01)

3.2. Test of structural model fitness of research model

The results of SEM fitness test showed that $\chi 2/df$ = 2.59 (p < .001), TLI = .879, CFI = .897, RMSEA = .088(90% confidence = .068 ~ .109) appeared as satisfying the model fit criteria (Chau, 1996; Hu & Bentler, 1999; Taylor & Todd, 1995) As <Table 4> showed, path coefficient of final model appeared creative learning self-efficacy influenced to academic adjustment (β = .668), to adjustment career maturity (β = .219), and academic adjustment impacted on career maturity (β = .626) The significance of standardized path coefficient is judged by C.R (> .05) The standardized path coefficients of each measure showed high range of β weights.

Table 2. Correlations among measured variables

	2	3	4	5	6	7	8	9	10	11
1	.743**	.813**	.563**	.582**	.545**	.628**	.491**	.504**	.533**	.539**
2		.764**	.445**	.532**	.423**	.486**	.436**	.480**	.426**	.500**
3			.525**	.539**	.451**	.512**	.553**	.534**	.554**	.571**
4				.837**	.808**	.816**	.656**	.670**	.660**	.680**
5					.824**	.771**	.711**	.703**	.647**	.720**
6						.804**	.613**	.642**	.595**	.660**
7							.531**	.584**	.574**	.616**
8								.860**	.855**	.859**
9									.881**	.900**
10										.870**

*** p <.01*

Table 3. Results of model fitness Test (N = 207)

	$\chi 2$ (df)	$\chi 2/df$	TLI	CFI	RMSEA(CI90)
연구 모형	118.726***(41)	2.59	.965	.974	.088(.068 ~ .109)

**** p < .001*

Table 4. Path coefficients of final model

Path	b	β	S.E	C.R
creative learning efficacy → academic adjustment	.673	.668	.067	10.040***
creative learning efficacy → career maturity	.219	.219	.070	3.125***
academic adjustment → career maturity	.621	.626	.072	8.645***
career maturity → self directed	1	.911		
career maturity → solution	1.008	.946	.041	24.627***
career maturity → self belief	.964	.926	.042	22.972***
career maturity → motivation	.988	.949	.040	24.822***
academic adjustment → environment	1	.917		
academic adjustment → class	1.045	.915	.048	21.928***
academic adjustment → achievement	1.001	.872	.052	19.338***
academic adjustment → college life	1.182	.894	.057	20.616***
creative learning efficacy → learning	1	.884		
creative learning efficacy → thinking	1.007	.831	.066	15.158***
creative learning efficacy → solving	.902	.879	.055	16.464***

*** $p < .001$

3.3. Direct-Indirect and mediating effect

The results of total, direct, and indirect effects analysis among creative learning self-efficacy, academic adjustment, and career maturity, and mediation effect of academic adjustment were as shown <Table 5> and the final model of this study is shown [Figure 1]. The direct effect of creative learning self-efficacy on academic adjustment was $\beta = .668$ ($p < .001$), the direct effect of academic adjustment on career maturity was $\beta = .626$ ($p < .001$), and the direct effect of creative learning self-efficacy on career maturity was $\beta = .219$ ($p < .001$) The indirect effect of creative learning self-efficacy on career maturity through academic adjustment was $\beta = .418$ ($p < .001$. Also, the results of the Sobel test showed that the path creative learning self-efficacy → academic adjustment → career maturity was statistically significant (Sobel test = 6.55, S.E = .0638, $p < .001$)

Table 5. Total, direct, and indirect effects of mediation model

Path	Total (β)	Direct (β)	Indirect (β)	
creative learning efficacy → academic adjustment	.668***	.668***		
academic adjustment → career maturity	.626***	.626***		
creative learning efficacy → career maturity	.637***	.219***	.418***	Sobel test 6.553***

*** $p < .001$

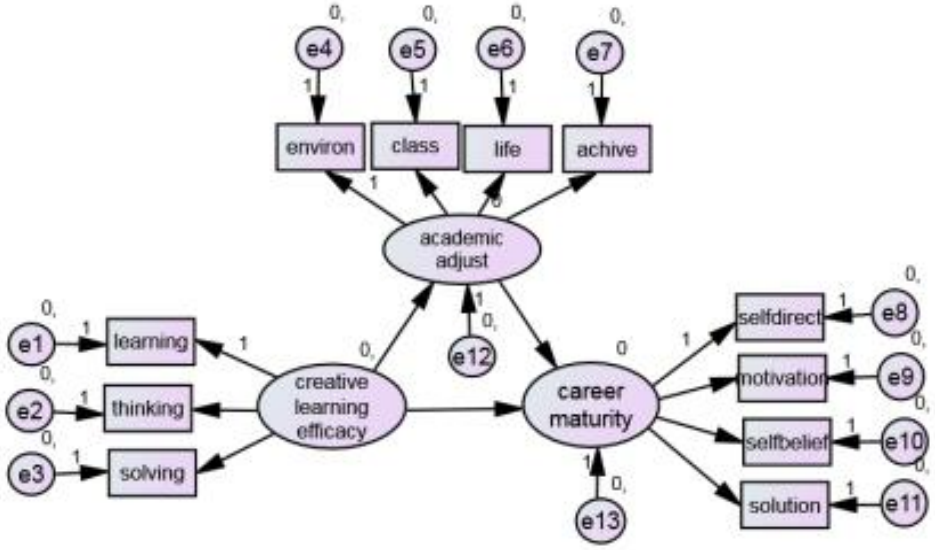

Figure 1. Final model

4. Discussion

Despite the well-recognized importance of career maturity in higher education, little research has been done of influencing school learning factors on career maturity for aeronautics major students. This study proposed to examine the relationships between creative learning self-efficacy and career maturity, and structural, to test the mediating role of academic adjustment in the relationship between the two variables. Based on the results of this study, theoretical and practical implications of the findings are discussed here. First, the results indicate that creative learning self-efficacy, academic adjustment, and career maturity were positively correlated with each other. The findings are seen at the similar context of studies. For example, learning self-efficacy impacted on positive emotion (Lee, 1988; Kim, 2000; Oh and Lee, 2001; Moon and Sim, 2001), self-efficacy influenced on career maturity (Kim and Choi, 2014; Ahn, 2004; Lee, 2002; Lee. 2001; Kim, 2002; Kim, 2016) Second, the results of structural model fit and mediating effects provide evidence that creative learning self-efficacy and academic adjustment are important schooling elements of career maturity.

These results are consistent with the findings of previous studies suggesting academic self-efficacy and creative experience influence to career development and maturity (Choi, 2014; Choi & Joo, 2013; Kim & Lee, 2015; Park and Han, 2016) And, the mediating role of academic adjustment contributes to college students' career maturity, and does decisive facilitation role to enhance career maturity of aeronautics major students.

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