

A Study on the Differences of Academic Achievement, Self-Efficacy, and Engineering Self-Efficacy with Gender of Engineering Students

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Abstract—The purpose of this study was to investigate relationships between satisfaction with major and career decision efficacy and career attitude maturity of engineering college students by performing correlation analysis. Gender differences in between satisfaction with major and career decision efficacy and career attitude maturity were also examined by T-test. The results T-test revealed gender differences in only career decision efficacy. Male Students scored significantly higher than did female students on career decision efficacy and satisfaction with major. The results of correlation analysis showed a) satisfaction with major were significantly associated with career decision efficacy, b) satisfaction with major were significantly associated with career attitude maturity, and c) career decision efficacy were significantly associated with career attitude maturity. As a result, we found the importance of satisfaction in engineering college students' major studies when deciding their career.

Keywords—Satisfaction with major, career decision efficacy, career attitude maturity, engineering college student.

I. INTRODUCTION

CAREER decisions made by young adults have significant implications for their lifestyle and their personal and occupational satisfaction. Making a career decision is a complex task; while some people make such decisions fairly easily, with no apparent difficulties; many others face difficulties before or during the decision-making process [1], [2], [3]. Therefore, Career decision-making (CDM) is a dynamic and multidimensional process. The identification, understanding and empirical validation of factors affecting CDM have practical application in career counseling and the implementation of effective counseling interventions [4]. Historically, studies focused on the decision-making of students, but later encompassed a broad life spectrum because over the course of time people came to need to revise their career decisions over their life span [5]. Career indecision has been linked to lower CDM self-efficacy and lower career maturity [6].

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Career decision-making self-efficacy is a relevant construct to seek help in making a career decision. Career decision-making self-efficacy was defined by [7] as "expectations of self-efficacy with respect to the specific tasks and behaviors required in making career decisions" that is, individuals' beliefs regarding their ability to successfully accomplish certain tasks connected with career choice [7], [8]. Low self-efficacy in a certain domain may lead to avoiding dealing with tasks and challenges in that domain. For example, in career decision-making one may avoid collecting relevant information, clarifying preferences, planning, or implementing the decision [7], [9]. It has been estimated that as many as 50% of university undergraduates are undecided about a career [4]. CDM self-efficacy and career maturity and CDM are positively related.

Career maturity is central to a developmental approach to understanding career behavior and involves an assessment of an individual's level of career progress in relation to his or her career-relevant development tasks [10]. It refers, broadly, to the individual's readiness to make informed, age-appropriate career decisions and cope with career development tasks [11]. Definitions include the individual's ability to make appropriate career choice, including awareness of what is required to make a career decision and the degree to which one's choices are both realistic and consistent over time [12].

Career maturity reflects a developmental process in which individuals increasingly gain the capacity to make sound career decisions. It has played a central role in theory and research on the career development of individuals of all ages and in all walks of life. [13] who introduced the concept of career maturity, defined it as an "individual's readiness to cope with the developmental tasks with which he or she is confronted because of his or her biological and social developments and because of society's expectations of people who have reached that stage of development". He identified five dimensions of career, or "vocational maturity," as he originally coined it: planfulness, exploration, information gathering, decision making, and reality orientation.

There is general research supports to the proposition that satisfaction with major is a valid predictor of career decision level and career maturity [14], [15], and career decision-making level. Lim et al [15] resulted that the low indecisive students were more satisfied with their major than high indecisive students. However, there is little research about

the relationship satisfaction with major and career related variables of engineering students.

This study sought to explore the relationship the relationship satisfaction with major and career related variables of engineering students, and to examine the grade and gender differences in between satisfaction with major and career decision efficacy and career attitude maturity.

II. METHOD

A. Participants

A total of 492 students from engineering college agreed to take part in the study. Of these, 77.2% of these were male students, 22.8% of these were female students. Of the 492 participants, 83 were 1st year, 159 were 2nd year, 159 were 3rd year and 91 were 4th year students.

B. Instruments

a. Career decision-making self-efficacy

The Career Decision-Making Self-Efficacy Scale (CDMSE; [7]). The CDMSE was developed to assess self-efficacy expectations associated with career decision-making. The response to each statement reflects the respondent's confidence in being able to accomplishing the described task. It has five scales: self-appraisal (SA), gathering occupational information (OI), goal selection (GS), making plans for the future (PI), and problem solving (PS). A higher score on the CDMSE indicates higher self-efficacy. Taylor and Betz [7] reported high scale reliabilities, ranging from 0.86 to 0.89.

b. Career attitudes mature scale

Career attitudes mature scale were assessed by the 47-item Career Maturity Inventory-Attitude Scale [16]. It has five scale: decisiveness, preparedness, independence, orientation, and conviction.

c. Inventory of satisfaction with major

The inventory of satisfaction with major developed by Sim. 22 Likert-type items asked participated to indicate degree of satisfaction with major on a 5-point scale.

III. RESULTS

Correlations for each of the variables in the study are presented in Table I. We found a significant positive correlation between satisfaction with major and Career decision-making self-efficacy. We also found a significant positive correlation between satisfaction with major and Career attitudes mature. Career decision-making self-efficacy was also significantly positively correlated with career attitudes mature.

A. Correlation

TABLE I
CORRELATION OF SCALES

	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.SS	-.51**	.61**	.39**	.27**	.25**	.32**	.31**	.30**	.29**	.10**	-.02	.10*	.16*	.09*
2.RS		-.42**	.36**	.25**	.29**	.26**	.30**	.28**	.23**	.02	-.14**	-.02	.01	-.01
3.GS			-.52**	.55**	.27**	.37**	.37**	.29**	.34**	.14**	-.06	.13**	.20**	.12**
4.CS				-.60**	.32**	.40**	.41**	.35**	.36**	.12**	-.02	.14**	.20**	.10*
5.CI					-.28**	.35**	.33**	.23**	.26**	.08	-.04	.09	.17**	.08
6.OI						-.63**	.75**	.57**	.63**	.41**	.15**	.34**	.39**	.22**
7.GS							-.72**	.65**	.76**	.54**	.21**	.44**	.40**	.35**
8.PI								-.66**	.74**	.56**	.21**	.48**	.47**	.36**
9.PS									-.65**	.37**	.22**	.37**	.43**	.29**
10.SA										-.55**	.26**	.47**	.48**	.40
11.DM											-.56**	.81**	.65**	.70**
12.OM												-.64**	.56**	.70**
13.CM													-.70**	.76**
14.PM														-.68**
15.I														
M														

*P<.05, **P<.01

Note: 1.SS=Subject Satisfaction, 2.RS=Relationship Satisfaction, 3.GS=General Satisfaction, 4.CS=Cognition Satisfaction, 5.CI=Career Inquiry, 6.OI= gathering occupational information, 7.gS= goal selection, 8.PI= making plans for the future, 9.PS= problem solving, 10.SA= self-appraisal, 11.DM= decisiveness maturity, 12. OM= orientation maturity, 13. CM= conviction maturity, 14. PM= preparedness maturity, 15. IM= independence maturity.

TABLE II
MEAN SCORES, STANDARD DEVIATIONS AND T-TEST OF THE VARIABLES

Variables	Sub-variables	Gender	N	M	SD	t
satisfaction with major	Subject satisfaction	Male	380	17.45	3.23	2.94**
		female	112	16.45	2.95	
	Relationship Satisfaction	Male	380	8.74	2.65	3.08**
		female	112	7.89	2.22	
	General Satisfaction	Male	380	17.17	3.49	3.69***
		female	112	15.80	3.27	
	Cognition Satisfaction	Male	380	20.00	4.92	1.48
		female	112	19.26	3.78	
	Career inquiry	Male	380	9.52	2.81	2.79**
		female	112	8.67	2.78	
Occupational information	Male	380	16.18	3.83	3.18**	
	female	112	14.90	3.18		
Career Goal selection	Male	380	17.26	3.79	2.13*	
	female	112	16.41	3.44		
Career decision-making self-efficacy	Making plans	Male	380	16.69	3.98	4.05***
		female	112	15.04	3.20	
Problem Solving	Male	380	17.05	3.60	2.29*	
	female	112	16.15	3.59		
Self-appraisal	Male	380	17.75	3.71	1.36	
	female	112	17.23	3.08		
Decisiveness maturity	Male	380	32.59	9.94	1.27	
	female	112	31.26	7.84		
Orientation maturity	Male	380	22.30	6.27	.09	
	female	112	22.24	4.12		
Career attitudes mature	Conviction Maturity	Male	380	34.03	8.91	1.40
		female	112	32.79	5.26	
Preparedness Maturity	Male	380	38.66	8.41	.71	
	female	112	38.06	5.58		
Independence maturity	Male	380	33.46	7.98	2.37*	
	female	112	31.55	5.41		

*p<.05, **p<.01, ***p<.001

B. Gender Differences

The analysis of gender differences of the variables was performed using t-test (Table II). The results showed that there were significant differences between the genders of variables.

The results were as follows: Male students have higher scores than female students in subject satisfaction, relationship satisfaction, general satisfaction, career inquiry, occupational information, goal selection, making plans, problem solving, independence maturity.

IV. CONCLUSION

The primary purpose of this study was to explore the relationship among satisfaction with major, career decision-making self efficacy and career attitudes mature. As a result of correlation analysis, there are significant positive correlation between satisfaction with major and career decision-making self-efficacy, satisfaction with major and career attitudes mature, and career decision-making self-efficacy and career attitudes mature.

Secondary goals of the present study were to examine the gender differences in satisfaction with major, career decision-making self efficacy and career attitudes mature. As a result of t-test, there are significant gender differences , male students have higher scores than female students in subject satisfaction, relationship satisfaction, general satisfaction, career inquiry, occupational information, goal selection, making plans, problem solving, independence maturity.

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