

Human Capital and Career Success of Structural Engineers towards Designing a Career Planning Model

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Abstract. Structural Engineers are a significant presence in today's workforce; however, few rise to the top management ranks. Therefore, there is a critical need to better understand the predictors that facilitate their career success. This study examined several variables that may contribute to structural engineers extrinsic (salary and promotions) and intrinsic (career satisfaction) success. Predictive variables include human capital (level of educational attainment and CE licensure examination rating). The aims of this study are the following: First, identify the status of structural engineers in terms of human capital. Secondly, determine the level of career success of structural engineer in terms of compensation fringe benefits and career satisfaction. Third, identify the factors predict extrinsic and intrinsic and Fourth, designed a career planning model which serves as a guide for young structural engineers to be successful that will help them to manage their career in the near future. This study used the descriptive method of research with questionnaires as the main data-gathering instrument. Statistical tests of Regression Analysis, percentage and weighted mean values were used to enable researcher give appropriate responses to the statement of the problem. Some interesting insights of the study are: The profile of structural engineers in terms of human capital contributes in the success of structural engineer. The level of educational attainment and Civil engineering examination rating were found to have highly contributed to career satisfaction of structural engineers. Further, the level of educational attainment can best predict extrinsic success in terms of promotion. Through the data results, two predictors will highly contribute to career success of structural engineers. These predictors such as level of educational attainment and CE licensure examination were chosen as integral factors to be indicators in the career planning model.

Keywords: civil engineering licensure examination, promotion, educational attainment, career satisfaction, career success, structural engineer, extrinsic success, intrinsic success, management.

1. Introduction

Career success has long been a construct of considerable interest to career scholars and practitioners not to mention the multitude of individuals engaged in a career. The career literature is replete with theories, models and accounts of career intervention programs aimed at predicting and ultimately facilitating career success. It is also an important outcome in many areas of career scholarship, such as those pertaining to career exploration and decision making. In addition, a multitude of studies have investigated how variables such as demographic variables, educational attainment and cognitive skills are empirically related to subsequent career success.

By contrast, curiosity little scholarly attention has been devoted to analyze the extrinsic and intrinsic career success of structural engineers. This research is important, for it will inform the facilitation of pathways and through employment within educational institutions, work places and communities, as well as at the socio-political and policy level.

Bosionoles (2004) defined career success as the extrinsic and intrinsic outcomes or achievements individuals have accumulated from their work experiences.

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He defined the extrinsic success as directly observable, measurable and verifiable by an impartial third party, while the intrinsic success is only experienced directly by the person engaged in her or his career.

Thus, extrinsic success is defined by verifiable attainments, such as pay, promotions and occupational status, which have long been considered the hallmarks of career success across a wide range of societies. However, intrinsic success is defined by an individual's reactions to his or her unfolding career experiences.

The lack of research is highlighted by Kim (2005) who remarked that little literature has empirically explored the relationship between extrinsic and intrinsic success and career planning. As such, it would be theoretically valuable to review and compare the predictors of these two components of career success in order to guide the research and theory building.

2. Literature Review

2.1. Educational Attainment

Research from career literatures indicates that return from educational attainment in terms of salary and promotions are significant (Oberfield, 2004). It also appears important to examine the effect of the education content because organizations reward masters and doctorate degrees more than other bachelor degrees. Besides education predict intrinsic career success (Edward, 2011).

2.2. Civil Engineering Licensure Examination Rating

This examination comprises of cognitive skills in Civil Engineering in the areas of mathematics, surveying, hydraulics, water resources engineering, structural engineering and geotechnical engineering (Professional Regulation Commission, 1994). The professional regulation commission in the Philippines conducts examination twice a year. The passing mark is 70% with no grade below 50% in the six areas.

Research has suggested that only individuals with high cognitive ability will be able to maintain the attention and effort necessary to master the task over period of time. This includes the Civil Engineering licensure examination rating as a measurement of general cognitive ability.

2.3. Salary and Promotions

Salary and promotions (Oberfield, 2004) are the most widely used and readily accessible indicators of career success. These extrinsic measures can have the substantial benefits of being readily available from existing records, standardized and efficient to collect. They are free from self-serving and common-method variance, if collected other than self-support. They are valued by many people, as anecdotally, reflected by De Molina (2004) quip that: "Folks who say they do not care about money will probably lie about other things too!"

Extrinsic Career Success was measured through four two distinct variables: Salary(less than P30000, P31000 to P40000, P41000 to P50000, P51000 to P60000 and more than P60000); and Promotion (basis of promotion and present position).

2.4. Career Satisfaction

Career satisfaction is most often assessed using the widely adopted career satisfaction scale developed by Greenhaus (1990). Although such standardized measures generally have acceptable levels of internal consistency, such characteristics are not necessarily sufficient to validly assess each respondent's subjective career success.

3. Research Methodology

The researcher utilized the inferential and descriptive methods of research. The subjects of this study were the companies located in the Philippines where vertical and horizontal structures projects are in progress. In 2011, record shows that 187 Structural engineers were employed in public and private firms. Purposive sampling was utilized in order to determine the participation of the knowledgeable employees only by considering those who meet the five criteria. The criteria are (1)Registered Civil Engineer; (2)

Minimum of three (3) years of structural design experience since graduation; (3) Two (2) years of significant engineering work; and (4) Member of the Association of the Structural Engineers of the Philippines. Questionnaires were distributed to all structural engineers of the Association of Structural Engineers of the Philippines.

4. Hypotheses

The following hypotheses were tested in the study:

Ho1 There is no significant relationship between the factors of career success in terms of educational attainment and civil engineering licensure examination rating and level of extrinsic and intrinsic success of structural engineers.

Ho2 None of the following factors such as educational attainment and civil engineering licensure examination predict extrinsic and intrinsic career success of structural engineers.

5. Profile of Structural Engineers

Majority of the structural engineers shown in figure 1a, 50.9% obtained an MS/MEng. degree and 26.4%, obtained a bachelor degree. Very few structural engineers, (22.7%) earned only a doctorate degree. Overall, the structural engineers appear to be highly educated holding a degree MS/MEng beyond a bachelor degree.

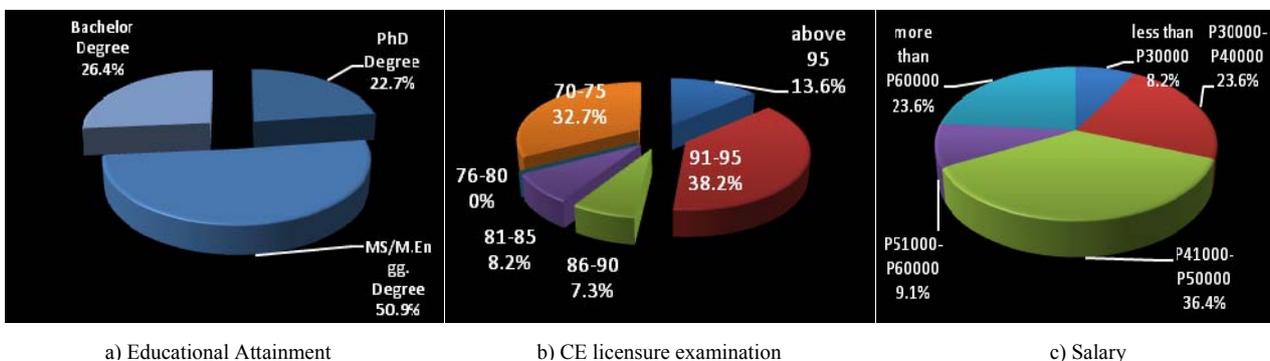


Fig. 1: Percentage Distribution of Structural Engineers

Many structural engineers have marked rating in the CE licensure examination shown in figure 1b, 38.2 % were 91 to 95% and 32.7% were 70 to 75%. Very few structural engineers have a marked rating in the CE licensure examination, 13.6 % were above 95%, 8.2% were 81 to 85 % and 7.3% were 86 to 90%. Most structural engineers have a high rating in the CE licensure examination.

6. Findings

6.1. Level of Extrinsic Success

More than one third of the respondents, 36.4% earned an average monthly salary P41000 to P50000 shown in figure 1c. There are also 23.6% earned an average monthly salary more than P60000, 22.7% earned an average monthly salary P30000 to P40000, 9.1% earned an average monthly salary P51000 to P60000 and 8.2% earned an average monthly salary less than P30000. Generally, structural engineers received high average monthly salary.

On the other hand, most of the structural engineers, 71% are in the administrative level shown in figure 2a. The positions of the respondents in the administrative level are: Construction Manager (28%), Project Manager (27%) and Vice President (16%). However, 29 % of the respondents are non-administrative level which is the position of Project Engineer. Majority of the structural engineers shown in figure 2b are promoted because of their personality traits such as creativity, loyalty, etc. (33.6%) and, experience and background (32.7%). Moreover, few structural engineers claimed that hard work (24.5%) is the basis of their promotion. Very few structural engineers chose performance history (9.1%) as basis of their promotion. Therefore, majority of administrative level in construction industries are occupied by structural engineer and most of them are promoted because of their positive personality traits, experience and backgrounds

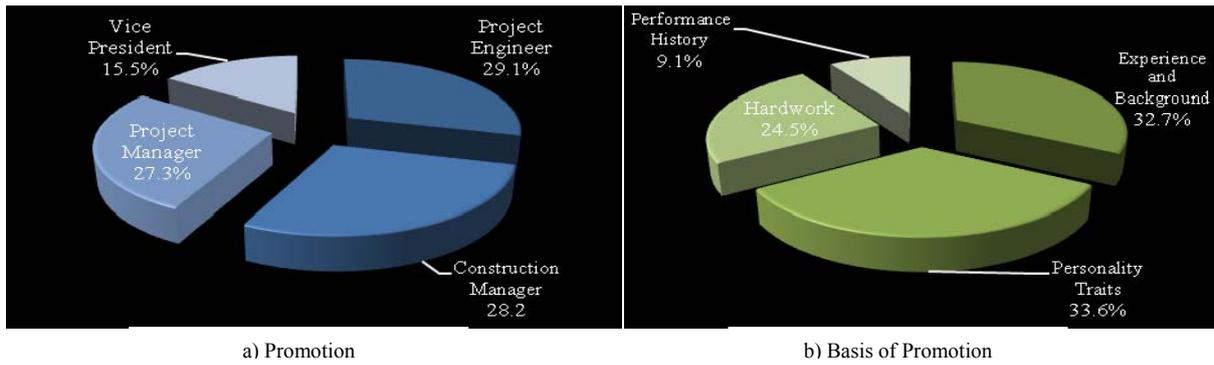


Fig. 2: Percentage Distribution of Structural Engineers and Level of Career Satisfaction

Respondents perception that structural engineers “strongly agree” that they are satisfied with their career with a mean composite response of 3.79 .In general, the level of career success for structural engineers in terms of career satisfaction was very satisfied

7. Predictors of Extrinsic and Intrinsic Career Success

The multivariate regressions predicting career success (salary, promotion and career satisfaction) are provided in Table 1. As the table indicates, each set of hypothesized variables (level of educational attainment and CE licensure examination rating) explained a significant variance in extrinsic and intrinsic success.

The level of educational attainment was found to have regression of salary, promotion and career satisfaction indicated by beta coefficient of 0.122, 0.428 and 0.286 as indicated by the R squared values of 0.006, 0.186 and 0.182 and computed significance values of 0.206, 0.000 and 0.000 and indicating a significant result at 0.05 levels The result indicated promotion and career satisfaction are significant to the level of educational attainment but not significant to salary. The finding implies that level of educational attainment is a predictor of promotion and career satisfaction. CE licensure examination has regression of salary, promotion and career satisfaction indicated by beta coefficient of 0.193, 0.037 and 0.126 as indicated by the R square 0.165, 0.359 and 0.147 and computed significant values of 0.176, 0.545, and 0.023. The result indicated that regression value of career satisfaction is significant to CE licensure examination rating but not significant to salary and promotion.

Table 1: Predictors of Career Success by Level of Educational Attainment and CE Licensure Examination Rating

Factors of Career Success	Career Success	Beta	R ²	Sig
Level of Educational Attainment	Salary	0.122	0.006	0.206
	Promotion	0.428	0.186	0.000
	Career Satisfaction	0.286	0.182	0.000
CE Licensure Examination Rating	Salary	0.193	0.165	0.176
	Promotion	0.037	0.359	0.545
	Career Satisfaction	0.126	0.147	0.023

8. A Planning Model for Civil Engineering Licensure Examination Preparation

Figure 4a is a guide for newly structural engineer graduates to achieve a Highmark’s rating in the licensure examination. In planning for licensure examination, the researcher suggests that graduate engineer should plan ahead and determine the necessary information for admission to save enough money both for the licensure examination and living expenses during that period. Take a CE preparation course to review the subject matter covered on the CE exam. Develop a schedule of study for CE examination, usually six hours per day and keep a positive attitude

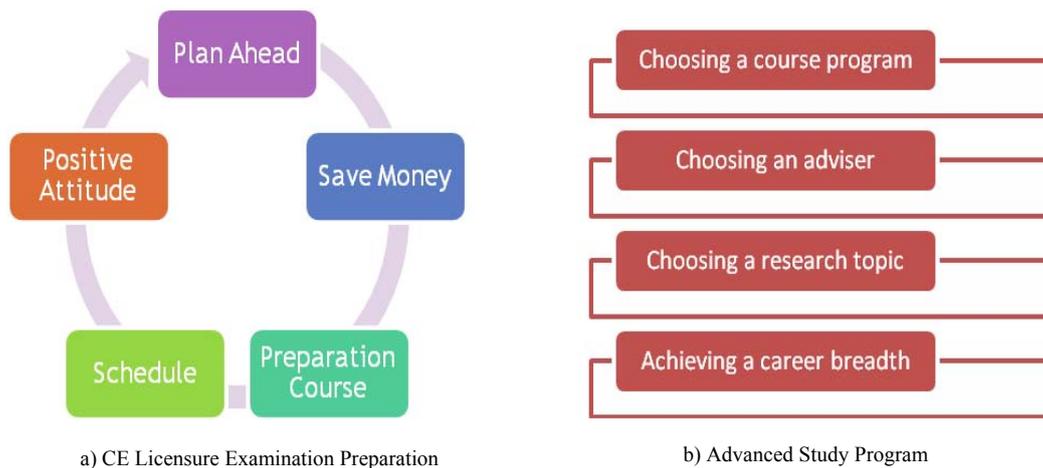


Fig. 4: Career Planning Model

9. A Planning Model for Advanced Study Program

Figure 4b is a practical guide for structural engineer to pursue advance study program as professional development. In planning to take up master's degree or doctorate degree, the researcher suggests that structural engineer should gather written descriptions of various programs that appeal to his applicants. In choosing an adviser, discuss important issues about plans, strengths and weak points. When thinking about topic, structural engineer should be creative and innovative to describe the perspective required of a thesis or dissertation. Career breadth is attained through such as on job trainings or internship and on-campus research centres that work in collaboration with industry. This can also help structural engineer to become mature and develop confidence in ability to succeed in their career.

10. Conclusion

The most objectively successful structural engineer appears to be one who has MS/MEng or doctorate degree and high rating in the Civil engineering examination. From the perspective of an individual who aspires to be a successful structural engineer, it appears that impressive educational credentials pay off. However, given the comparability in results between the extrinsic career success and career satisfaction, the Civil engineering licensure examination rating and impressive educational credentials also contribute to structural engineer career satisfaction. On the other hand, the level of educational attainment can best predict extrinsic success in terms of promotion.

11. References

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