

Factors Influencing High School Students to Pursue a Construction Baccalaureate

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It is extremely challenging to select the right career path for a high school student. A primary factor influencing high school students to enter construction-education program is because their parents, relatives or friends work or have worked in the industry. This study analyzes characteristics and academic interests of 234 high school students enrolled in construction curricula at four Career and Technical Academies. Four hypotheses were formulated for the study: (1) a family member's employment in construction related industry affects a student's decision to select construction as an area of study in high school; (2) a family member's employment in a construction related industry influences the interest of a student in pursuing a baccalaureate in construction; (3) students who were enrolled in a construction curriculum desire to pursue a baccalaureate degree in construction: and (4) desire to pursue a baccalaureate degree in construction is independent of the student's belief that employment is readily obtained in this discipline. Hypotheses 1, 2, and 4 were supported positively. The study's findings will benefit educators and educational administrators in understanding what factors influence the choice of academic study in construction discipline at the high school level and these students' desires to pursue a baccalaureate.

Key words: construction education, high school student, interest, employment, influence

Introduction

Prior to high school, students have few electives in the prescribed K-8 curriculum. They are required to take courses in the prescribed basics and fulfill all minimum requirements of the schools. As students enter high school they are afforded more choices from which they can begin to tailor their education towards the future career they envision for themselves. At this point there are many influencing factors that affect the choice of the academic area that they select to pursue. It is a widely-held belief that for students studying construction one of the major influencing factors is related to their parent's employment and their influence in recommending an area of study.

Geographic location, socioeconomic status, parental work-related attitudes, families, peers, education, availability of occupational information, demands for the job, difference in age, gender, and personal characteristics all influence career choice (Splete and Freeman-George, 1985; Otto and Call, 1985; Larson et al., 1994; and Borg, 1996). The myriad curricula offered in today's high schools increase the difficulty for students to choose an appropriate area of study. It is likely that some students are influenced in their choice by the present employment market's conditions, deceptive education and career advertisements, poor advising by their high-school advisor, and over estimating their knowledge in prerequisite coursework areas. The combination of these factors can adversely affect the proper selection of an academic area of study that will provide a stable and satisfying long-term career.

Literature Review

Why different individuals were interested in a career in the construction industry were investigated and ways to promote construction as a career choice were recommended by Swoboda and Cieslik, 1997. A questionnaire survey was administered and data analyzed for 520 respondents. The respondents were students from junior and senior high schools, associate degree programs in construction, and skilled workers employed in the construction industry. The research concluded that self, family, and friends influence were the top reason given for selecting construction as their career choice. The result indicated that 61 percent of the high school students were unwilling to pursue a career in construction for the following reasons: not interested, work conditions, low pay and little knowledge of the construction industry.

To generate information on career influences in terms of the experiences and relationships students in construction management programs were examined by Koch, 2007. Responses were collected from 504 students from four accredited construction management programs in a midwestern state. The study found that fathers had the greatest influence on students. Hands-on activities and inside/outside work experiences were also influencing factors.

Family influences on career development were investigated by Splete and Freeman-George, 1985. In particular the factors that affect one's career decision making and career development were studied. Those factors were: geographic location, genetic inheritance, family background, socioeconomic status, family composition, parenting style, and parental work-related attitudes. The study concluded that these factors influenced the formation of self-concept, values, and personality, which in turn influenced initial career choice and education.

Scope and Objectives of the Research

This research was conducted to assist educators and educational administrators in understanding student interest in the construction discipline at the high school level. The research was conducted at four Clark County School District (CCSD) Career and Technical Academies (CATA). The CCSD is located in southern Nevada and is the fifth largest school district in the United States (CCSD Fast Facts, 2009-10).

The objective of this research was to investigate characteristics and academic interests of CCSD-CATA students enrolled in construction curricula. Various factors that influenced a student to attend a CATA construction program and his or her choices to pursue a baccalaureate in construction were investigated.

Research Hypotheses

Four research hypotheses were formulated for this study. They are: (1) A family member's employment in a construction-related industry affects a student's decision to select construction as an area of study in high school: (2) A family member's employment in construction-related industry influences the interest of a student in planning to pursue a baccalaureate in construction; (3) There is a relationship between the CATA student's choice to pursue a baccalaureate and the CATA curriculum in which he or she is enrolled: (4) The interest in pursuing a baccalaureate in construction is independent of the student's belief that employment is readily obtained in this discipline.

Research Methodology

This research is a part of a larger exploratory study conducted by CCSD (Kisi, 2010). The data is from high school students enrolled in architecture, construction, and engineering curricula. CATA students may select architecture, construction, and engineering curricula that are either college preparatory or vocational in nature. This research was conducted at four CATAs and all students enrolled in the architecture, construction and engineering curricula were the sample. This type of sampling is not random and is therefore non-probability sampling. The four CATAs were the: Advanced Technologies Academy, East Career and Technical Academy, Northwest Career and Technical Academy, and Southeast Career and Technical Academy. Enrollment in a CATA is through a competitive process. The curricula vary across the CATAs and not all curricula are offered at every CATA. For this paper students enrolled in construction curricula were the subject of study. Data used in this research were collected by a questionnaire that was distributed via the paper survey method. The questionnaire was designed to gather the information using the check-off format, Likert-scale format and write-in format. The questionnaire was administered by CATA teachers to grade 9 to grade12 students at their school. Students submitted their completed questionnaires to the class teacher, then collected by CCSD Administration and forwarded to the researchers for analysis.

Of the 880 respondent, 724 respondents' surveys were sufficiently completed for analysis. Of the usable surveys, 234 respondents were enrolled in construction curricula. In order to summarize the information provided by the respondents the data collected was entered into a spreadsheet-based database that was used to perform descriptive analysis and to generate tables and charts. All the variables were assigned numbers to represent them correctly and to simplify the data entry process. For example, the questions with yes and no responses were entered in database by assigning 1 = yes and 0 = no. This generated a database containing approximately $2x10^6$ data points.

Survey Results

The distribution of gender by age is shown in Figure.1. The distribution shows a strong male dominance with 82 percent male and 18 percent female students enrolled in construction curricula. Eighty-one percent of the students were below age of 17. The age distribution is effected by the opening of the CATAs. The first CATA was opened in 2007 followed by the one-year sequential opening of the remaining new CATAs every year. Only grade 9 and 10 students are initially admitted when a new CATA is opened.

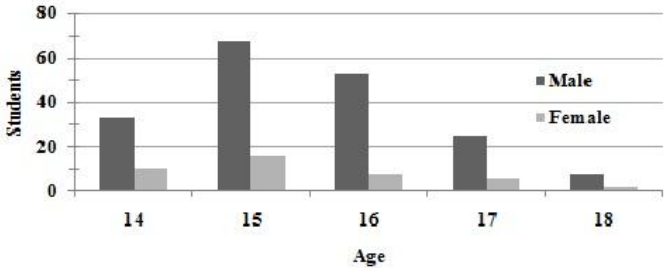

Figure.1: Distribution of gender and age

Students enrolled in construction curricula were asked to indicate disciplines in which they wished to pursue a baccalaureate. They were asked to select a first, second and third priority baccalaureate. Figure 2 shows the results of first priority selections of the 195 students who responded. Construction management and construction engineering disciplines were indicated as first priority by 17 percent and 8 percent of the students respectively. A nearly equal percentage of students selected architecture as selected construction management. Forty-one percent of the students selected baccalaureate disciplines other than construction management, architecture, architectural engineering, construction engineering, civil engineering and interior design.

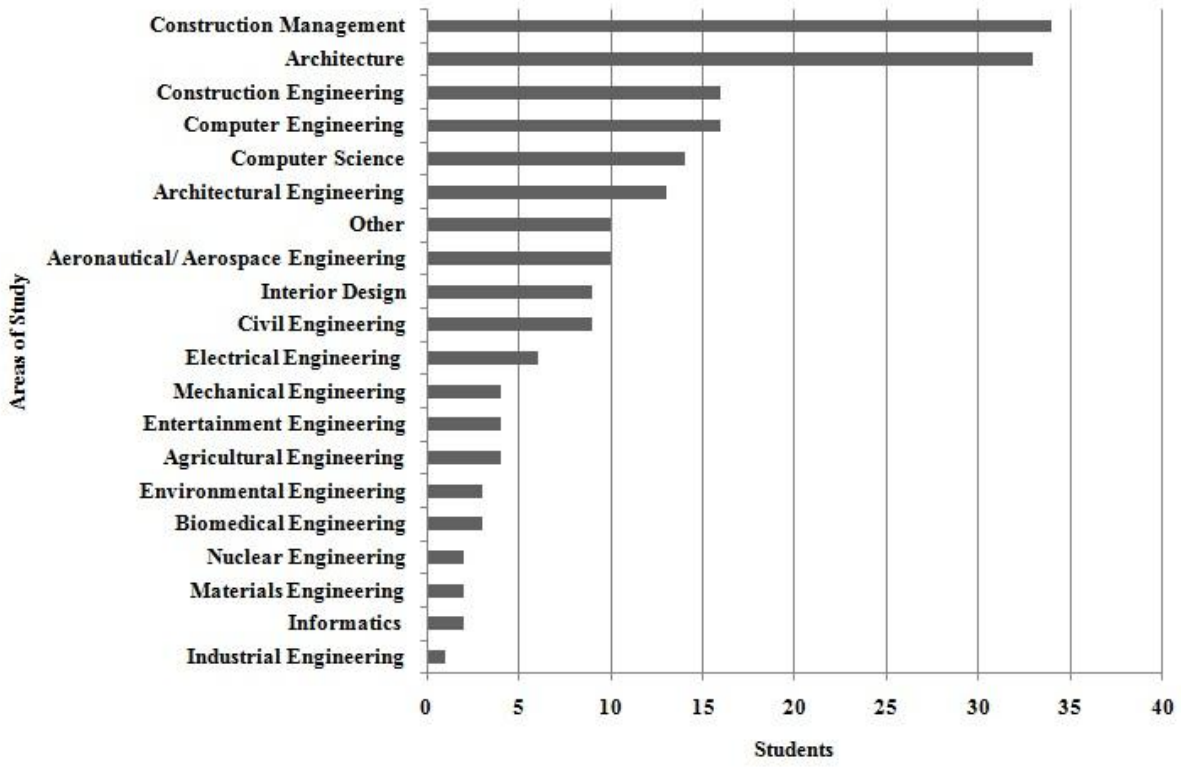

Figure 2: Disciplines selected as first priority by students enrolled in construction curricula

Table 1 provides a summary of the results obtained in response to the question that determined what family members and relatives had previously been employed in or were presently employed in construction-related areas. Fathers and uncles were found to be more employed in construction-related work.

Table 1

Family members and relatives employed in construction-related work

	Family Members									
	Father	**Mother**	**Brother**	**Sister**	**Grand-father**	**Grand-mother**	**Uncle**	**Aunt**	**Cousin-male**	**Cousin-female**
Number	103	7	14	1	40	4	85	8	37	9
Percent (%)	44	3	6	0	17	2	36	3	16	4

Table 2 provides a summary of the results obtained from students regarding actions taken prior enrolling in a CATA construction program. Less than 50 percent of the students showed interest in inquiring about the program prior to enrolling in it.

Table 2

Students' actions prior to enrollment in a construction curricula at a CATA

Action	**Yes (%)**	**No (%)**
Talk to any student(s) presently enrolled in a CATA construction program prior to your enrollment	44	56
Talk to a program teacher in a CATA construction program prior to your enrollment	27	73
Listen to a recruiter's presentation on the CATA program that you are presently enrolled in while you are in middle school	49	51

Discussion

The first hypothesis was to determine if there is a positive association between student's enrollment in a construction curricula and the employment of at least one family member in construction industry. The result of the analysis shows that 61 percent of the students, who choose construction, had at least one family member employed in the construction-related area.

When analyzing the CATA student's intent to pursue a construction baccalaureate and the employment of at least one family member in construction, 64 percent of the students' responses indicated that they had one or more family members who were involved in construction. This further proves that family role is a significant influence in career choice as was found by Roe, 1956.

The cross tabulation shown in Table 3 deals with how much the percentage is that a family member influences when anyone of the family members is employed in construction-related areas. The results presented in this table are based upon the survey question, "Check all of the following individuals and factors that have influenced your decision to select any of the following areas of study in high school." and the survey question, "Check all of the family members and relatives who have previously worked or presently work in the following areas." The result shows that when the father was employed in construction his influence was 41 percent for the progeny to choose construction, and at the same time, the mother's influence was 14 percent, a brother's six percent, a sister's three percent, an uncle's 15 percent, an aunt's six percent, a grandfather's ten percent, and a grandmother's five percent. Similarly, when a grandfather was employed in construction, his influence on the child was highest. For the rest of the family members, the father's influence was still high. This further narrows down the previous result and concludes that the father has greater influence on the progeny even though other family members were employed in a construction-related area.

Table 3

Cross tabulation of employment in construction vs. influence percentage

Employment in construction	Influence percentage							
	Father	Mother	Brother	Sister	Uncle	Aunt	Grandfather	Grandmother
Father	41	14	6	3	15	6	10	5
Mother	32	23	6	6	6	10	10	6
Brother	35	9	13	4	15	9	13	2
Sister	30	9	0	9	9	17	13	13
Uncle	41	16	8	5	3	6	15	6
Aunt	23	18	8	5	18	10	10	8
Grandfather	17	15	4	4	19	6	25	9
Grandmother	21	13	8	4	13	8	17	17

The data were analyzed and the relationship identified between CATA students enrolled in a construction curricula and their intent to pursue a baccalaureate. The results are shown in Table 4.

Table 4

Student's curricula and intent to pursue a baccalaureate

Student's study area	Respondents	Area of first priority to pursue a baccalaureate	First priority (%)
Construction (234)	195	Architecture	28
		Construction Management	18
		Construction Engineering	8
		Engineering	41
		Other	5

Table 4 reveals that students in CATA construction curricula are less likely to pursue a construction-related baccalaureate than a baccalaureate in architecture or engineering. The engineering category in Table 4 represents all engineering disciplines other than construction engineering. A possible reason for this result might be due to the ongoing economic recession when the survey was conducted. During this period construction worker layoffs in southern Nevada were increasing daily and approaching approximately a 70 percent unemployment figure. Additionally, large privately-financed capital-facility projects and public projects were being canceled or delayed. During an 18 month time period in 2007-2008 there were 12 highly publicized construction fatalities that occurred on construction projects on the Las Vegas Strip (Allen, 2009) which highlighted the dangerous nature of construction.

The CATA students provided information regarding their beliefs about post-baccalaureate employment in construction. The objective was to determine if their beliefs influenced their consideration to pursue a construction-related baccalaureate. Their responses indicated that they were not going to pursue a baccalaureate in construction based upon the assumption that employment would be easy to obtain just by earning a baccalaureate. Sixty percent of the respondents who indicated that they wanted to pursue a construction-related baccalaureate supported this conclusion. The analysis of the relationship between post-baccalaureate employment and interest in pursuing a construction-related baccalaureate shows 40 percent which shows a weak association between interest in pursuing a construction-related baccalaureate and post-baccalaureate employment in construction.

Conclusions

The analysis revealed that when a family member is employed in a construction-related industry the likelihood that a student will enroll in a CATA construction curricula increases. The results supported the first research hypothesis

that a family member's employment in a construction-related industry affects a student's decision to select construction as an area of study in high school.

When family members are employed in a construction-related area there is a greater likelihood that their children will pursue a baccalaureate similar to the field in which their parents are employed. In this research more that 60 percent of the students indicated that they had one or more family members who were involved in construction. Thus, the second research hypothesis is proved that a family member's employment influences the academic choices of a student.

Forty-one percent of the students enrolled in a CATA construction curricula, indicated as their first priority a non-construction related discipline for their planned baccalaureate study. This result was counterintuitive, as a stronger degree of students planning to pursue baccalaureate study in a construction-related area was expected from students already enrolled in a high school construction curriculum. Surprisingly, only 26 percent of the students enrolled in construction curricula indicated construction management or construction engineering as their first priority for baccalaureate study.

Approximately 10 percent of CATA students enrolled in architecture-, construction-, and engineering-related curricula were found to be interested in pursuing baccalaureate-level study in construction management or construction engineering. The results of this study are significantly below the finding of Swoboda and Cieslik (1997) where 39 percent of their respondents were willing to pursue a career in construction.

There was not sufficient proof to validate a strong positive association between students enrolled in a CATA construction curricula and their plan to pursue a baccalaureate in a construction discipline. However, 69 percent of the CATA construction students still wanted to pursue architecture- and engineering-related baccalaureates.

Results of this research found that less than 40 percent of the respondents believed that employment is easy to obtain after earning a baccalaureate in construction. This validates the fourth research hypothesis that the interest in pursuing a baccalaureate in construction is independent of the student's belief that employment is easily obtained in this sector. This finding supports other researchers' findings that students are more connected to the performance-oriented aspects of careers than monetary remuneration (Hatzios, 1996), and it would not seem beneficial to expend inordinate resources on marketing information about high levels of job placement to potential construction management students (Koch, 2007).

Research Limitations

The research is based on student responses from four Clark County School District (CCSD) Career and Technical Academies (CATA) students. The results may not represent other technical academies, comprehensive high schools or vocational high schools. More definitive results can be obtained if more high schools are surveyed and more geographical locations included.

It is important to note that the research is conducted in southern Nevada and the K-12 educational system in Nevada and CCSD is ranked as the fifth largest school district in the United States. It is not known how the ranking of a State's educational system may impact the results of this research. States that are ranked much higher or lower may have different outcomes if the same survey were administered to their students.

Recommendations

Further research is recommended to improve the determination of the perception of the construction industry by CATA students enrolled in construction curricula. Different questions related to construction curricula, student interests, job potential, and image of the construction industry should be included and comments taken in order to better address issues regarding the seemingly low academic interest in construction. Advance statistical analyses (multivariate regression, factor analysis, etc.) are recommended to better understand the importance of the various factors driving student interest in enrollment in high school construction curricula that is college preparatory in nature. Additional research should be conducted to investigate the cause of the seemingly low interest in CATA construction students in pursuing baccalaureate degrees in construction.

References

Allen, M. (2009). "Sun wins the Pulitzer Prize." *Las Vegas Sun.* April 21, 2009.

Borg, R. (1996). Factors determining career choice. *European Education, 28*(2), 6-20.

CCSD Fast Facts 2009-10 (2010, October 2). *Clark County School District,* [WWW document] URL http://ccsd.net/news/publications/pdf/CCSDFastFacts.pdf.

Hatzios, M. K. (1996). Effective models for measuring students' attitudes toward the marketing education program. *Journal of Vocational and Technical Education, 13*(1). 69-78.

Kisi, K. (2010). High school student interests in architecture, construction, and engineering education. Unpublished masters thesis, University of Nevada Las Vegas, August, 2010.

Koch, D. C.(2007) Experiences and relationships that influence construction management students' career choice. *Proceedings of the Associated Schools of Construction International, USA.*

Larson,J., Butler, M., Wilson, S., Nilufer, M. and Allgood, S. (Sept/Oct. 1994). The effects of gender on career decision problems in young adults. *Journal of Counseling & Development, 73*(1), 79-85.

Otto, L.B. and Call, V.R.A. (1985). Parental influence on young people's career development. *Journal of Career Development, 12*(1), 65-9.

Roe, A. (1956). *The Psychology of Occupations*. New York: Wiley.

Splete,H. and Freeman-George, A. (1985). Family influences on the career development of young adults. *Journal of Career Development, 12*(1), 55-64.

Swoboda, L. B., and Cieslik, T. (1997). Selecting the Construction Industry as a Career: An Analysis. *Construction Education, 2*(3), 193-210.