

Influences Affecting Students When Selecting a Construction Management Master's Degree Program

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Construction Management graduate degree candidates enrolled within Associated Schools of Construction (ASC) programs at ten universities were surveyed in an effort to determine what student centric influences steer potential students to select one university over another. Data collection was done through a 6-question on-line survey distributed to 369 students that resulted in a usable sample population of 82 (N=82). Analysis of the results indicate the major determinants influencing the student's ultimate program selection were 1) their specific career focuses, 2) the impact that a program's website has their selection when shortlisting candidate universities, and 3) a strong student centric focus on program duration, available funding support, pre-requisite requirements, and the availability to pursue specialty tracks.

Key Words: Construction Graduate Education, Adult Learner

Introduction

Graduate level construction management education is a legitimate and distinctive area of academic study in many US and international universities. Currently there are 140 universities listed as members of The Associated Schools of Construction (ASC). Founded in 1965, the ASC is a professional association for the development and advancement of construction education. Among these 140 universities approximately 40 offer graduate level degrees. The purpose of the following research effort is to gain information and an understanding about regarding what determinants were valued by Construction Management (CM) graduate students when they selected a CM based Master's degree program. This research study is based within the US and is not intended to be reflective of global trends, geographical regions, international students, nor industry sector.

Methodology

A sample pool was developed from ten ASC Research 1 universities offering Master's degrees in construction management (See Table 1). For ease in developing a peer sample the ASC founding CM programs were selected. Two additional peer programs were added to increase the sample. A peer assessment of the 10 programs was done to validate longevity, uniformity, and similarity in programs and universities.

Table 5: Peer Program Participants (Founding ASC Members)*

- Arizona State University *
- Auburn University *
- Clemson University *
- Colorado State University *
- Michigan State University *
- Purdue University
- Texas A&M University *
- University of Florida *
- University of Nebraska *
- Virginia Tech *

The methodology used to complete the current investigation is noted below.

1. Measurable program parameters were hypothesized, by the authors, as reasonable student selection criteria.
2. Limitations of the investigation were established.
3. Previous literature was reviewed to support the hypothesized program parameters.
4. Peer program selections were made and each program's website was reviewed to establish a baseline peer program metric.

5. The program's point of contact (POC) was identified and interviewed by phone to validate current website content.
6. A six-question survey was developed and internally reviewed, modified, and distributed as an online survey to a sample population of current CM master's students at Virginia Tech.
7. Upon validation of the survey questions, a survey link was sent to each program's POC requesting the link be distributed to the program's master's students with a request to complete the survey.
8. The survey was open and data collected over a three week period.
9. Data was analyzed in a qualitative manner and reported.

Literature Review

A literature review was conducted to identify parameters that CM master's degree candidates valued when making application and enrollment selections. There is a gap in the literature regarding prospective master's student values when selecting construction based graduate education programs. As a result the literature review was unable to establish exact decision parameters as valid determinates for selecting a CM graduate program. There were discoveries on the general question of how prospective graduate student and adult learners decide which program is the best for their circumstances. This work was not intended to create new knowledge but was prefaced as a mechanism to allow Virginia Tech to respond with modifications to its Master's program that aligned with student desires and the potential to enhance the recruitment of CM master's degree candidates. Two articles, one by Williamson and Grankowski (1997) and another by Abdelhamid (2003) is the extent of construction education literature related to student perception, decision-making, and motivation when seeking an academic CM program that meets their perceived needs. Aspects of consumer choices in higher education were explored yielding insight into a rapid and expanding market for graduate certificates. No additional literature regarding consumer choices for CM graduate degree candidates was observed.

Williamson and Grankowski (1997) produced a construction education study identifying motivation and maturity as influential factors in forming and predicting a student's attitude and motivation toward career educational choices. Although the Williamson and Grankowski (1997) study was targeted at undergraduate construction students it was deemed relevant, to this study, as an indicator of student perceptions that could aid in the survey design. Abdelhamid's (2003) study was designed to evaluate the teacher-learning style disparity at Michigan State University's Construction Management Program. The Felder-Solomon Index of Learning Styles (ILS) questionnaire was administered to 5 instructors and 271 undergraduate students and 6 graduate students. The study revealed that students predominantly preferred active learning as the primary mode of instruction. Although not focused on graduate students, Abdelhamid's work allows an understanding of what students' value inside a CM program and it connects to the research question of what influences student choices, in specific program's attractiveness.

Wold-McCormick's (2000) non-construction based study on adult learners is useful in understanding motivations of adult learners and was also used to help form the survey instrument. This study identified several factors related to decisions made by individuals who selected non-traditional graduate degree programs over long-standing traditional degree programs. Although not perfectly aligned to this current research study, the Wold-McCormick's study was used as an indicator to identify existing parallels that could assist the current research focus. If parallels in the Wold-McCormick study were identified they might indicate a commonality and provide a basic understanding of what program parameters a master's student seeking construction education might value. Wold-McCormick defined adult learners as a student; older than 24, or does not live in a campus residence, or is a part-time student, or some combination of these three factors; and who is not greatly influenced by the social environment of the institution and is chiefly concerned with the institution's academic offerings like courses, certifications, and degrees. Among the commonalities discovered is that of master's programs and adult learners (does not live in a campus residence and is age >24). Two findings from the Wold-McCormick study, speed of degree completion and adult learning convenience and practicality, were considered insightful regarding unmet non-traditional student expectations of a graduate program and were used to develop additional survey questions.

Although not specifically related to construction education, Everhart's (2008) "Making Meaning of New Traditional Gradate Student's Selection of Master's Degree Educational Leadership Programs" addresses relevant questions within the current study. These questions being; 1) what is the decision-making process of a new traditional graduate student when selecting a specific educational degree program, 2) what factors were considered and evaluated when

going through this process, and 3) what experiences were important in influencing the student's decision? Everhart's work was explored further because a parallel exists in regards to selection parameters for current master's students. Everhart's work yielded two important components for use when assessing a student's program selection. These being; 1) Initially Important, and 2) Ultimately Important. Everhart identified cost and convenience as initially important but the ultimate decision to attend a specific program was based on cohorts or interpersonal relationships and program rigor. Additional insights derived from Everhart's study, for use in this current study, were entry and exit requirements, program options, student funding, and cost per credit hour.

Survey Instrument

A six question survey instrument (Appendix A) was designed to discover what current Construction Management Master's degree students valued when selecting a university and a construction based graduate education program. The basic survey structure is divided into one career path demographic question, two scale influence questions, one focused on Internet influence in shortlisting program selection and a second focused on the influence of professional certification credit opportunities. An additional question explores specific specialty tracks as a selection criteria; and two other questions focus on important parameters used when ultimately selecting a specific academic institution to attend.

Questions #1-3 are about simple selection processes. Question #1 is a description of the students selected career path, question #2 is how influential is a program website in shortlisting a desirable academic program, and question # 3 is aimed at the external influence of providing credit for studying for professional certifications. Survey questions #1-3 were quantified and reported upon using a descriptive analysis approach. Question #4 is critical to establishing an indication that certain program parameters have higher values in academic program selection. Question #4 secured a student ranking of the importance of program parameters used when making a final program selection. To provide greater amplitude in separating the results of this question, a weighted scale from 1-11 with a weight of 11 being the most important was used for assigning resultant values. Question #4, 5 and 6 are open-ended questions seeking personal responses.

Due to the absence of previous research in the area CM graduate program value-based selection choices and a concern for an adequate response rate, a pre-release of the survey was utilized before the final survey was released to peer programs. Points of concern in developing a pre-release version of the survey were adequacy and relevance of questions, duration to complete the survey, and the respondent drop-out rate. A majority of the 20 pre-release respondents were able to start and complete the survey in less than 10 minutes. Assessment revealed a 100% response rate with individual responses diminishing only on the optional questions, #5 and 6. All six questions were validated through the pre-release. Based on the positive responses from the pre-release survey, the survey was distributed without any modifications. Qualtrics survey software was used for survey distribution, data collection and correlation. The survey and research process was reviewed and approved by Virginia Tech's Institutional Review Board (IRB) prior to distribution. Access was granted by each sampled program's graduate education coordinator and the surveys were distributed via the program's graduate student e-mail listserv. Two follow up e-mails were sent to the total survey population.

Analysis

The survey population was limited to the 369 (N=369) enrolled master's students from the 10 sampled universities. A population of 83 survey respondents was identified by university (Table 2) using IP addresses that were identified to a University during the survey's completion. One respondent was unmatched to a particular university and dropped for the data. Programs with a student response rate of 10 or more were evaluated in greater detail. The response rate of this specific online survey was 22%, a higher response rate than the 13% return rate commonly achieved from online surveys administered to unmet individuals (Dillman, et. al. 2009). Although the sample is below the statistically significant confidence level it is an indicator of the specific population of interest and thus useful for providing insight into how CM Master's students self-identify their career paths and their perceive aspects of educational influence and choice. Due to the limited sample size this report is technically not a statistically representative sample; therefore the findings represent only the opinions expressed by those in the sample population. Scores used to verify several of the questions are mean based and based on the distribution of the

sample results may bias the sample. Additional bias may be exist, particularly in question #6, due to the sample being over-represented by students currently enrolled within existing specialty programs. Therefore, conclusion cannot be made that the opinions expressed by those in the sample represent the opinions of those in the population ("MPIWEB," 2012).

Table 6 – Responses (n=82)	
Virginia Tech	31
Colorado State University	14
Clemson	11
University of Florida	10
Auburn	5
Purdue	5
Michigan State University	2
Arizona State University	2
Texas A&M	2
University of Nebraska	0

Question #1 - *"Which best describes your career plans."* The respondents were able to choose a career path from among active duty military, construction industry, academic career, and other. Ninety-four percent (94%) of the survey sample self-assigned into one of the three listed career categories, authenticating among the sample that these three career paths are valid choices and can be used for additional analysis. Seventy-two percent (72%) of the respondents (60) self-identified their career plans as construction industry (significantly higher than the other two career plan categories, 12% academic (10 respondents) and 10% active duty military (8 respondents) (Fig. 1). The significance of the separation of construction industry career plan respondents from the other respondents gives supports to a supposition that it is an accurate reflection of career plans for a large majority of CM Master's candidates.

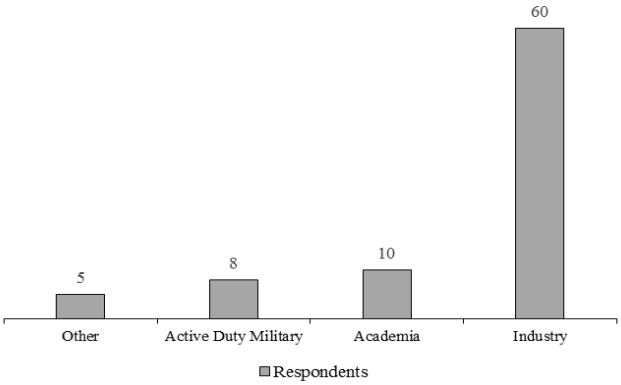

Figure 7 – Question #1 - Career paths

Question #2 - *"How influential on a scale of 1-10 is Internet research in shortlisting your selection of a construction based graduate education program?"* This question is rated on a 0-10 scale with 0 being not important at all and 10 being extremely important. The average value of importance for Internet research for this survey sample is 7.24 out of 10 with a standard deviation of 2.23. The minimal value that any one student ranked Internet research was a 0.0, with the maximum value being 10.0. With an average value of importance of 7.24 for the survey sample it is evident that the program's website highly influences in the shortlisting process. This especially true for active duty military academic students who reported an average value of 7.43 and 8.20 respectively.

Question #3 - *How influential on a scale of 0-10 would a professional certification option be in your selection of a construction based graduate education program?* (See Appendix A for the full question.) This question is rated on a 0-10 scale with 0 being not important at all and 10 being extremely important. The average value of importance for professional certification option for this survey sample is 7.45 out of 10 with a standard deviation of 2.09. The active duty military respondents valued the professional certification option at a much higher level than academic

and industry respondents with a reported value of 8.63 with a standard deviation of 1.30 versus the academic student value of 5.90 with a standard deviation of 2.33.

Question #4 - *"Rank the following qualities of a graduate program that most interest you."* (See Appendix A for the full question.) Student respondents ranked 11 decision parameters in the level of importance to their selection process (Fig. 4). The importance of choices varied based on the self-selected career path, yet in an overall analysis (n=82) and among the industry practitioner career path the top four parameters ranked by importance are: 1) program duration, 2) availability of student funding, 3) prerequisite requirements and 4) availability of specialty tracks. Overall, faculty-student-faculty ratio (10) and the number of tenured faculty (11) were the two least important selection parameters.

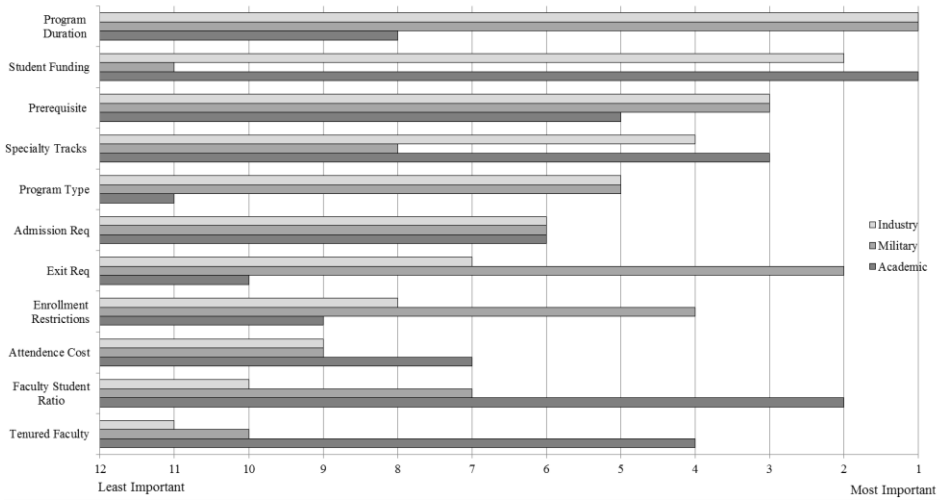

Figure 8 - Question #4 - Ranked parameters of interest

Question #5 - *"Are there any program qualities not listed in Question 4 that you would take into account when determining what construction program to attend?"* (See Appendix A for the full question.) This question was an open-ended question that required leaving the entry blank, entering no or none, or entering a specific response into the survey. There were 65 identifiable responses. Any response that occurred more than three times was tabulated and recorded. The responses are as follows: 32% (21) specifically identified no or none; 18% (12) identified Program Ranking/Reputation; and Industry Ties identified by 15% (10) of the 65 respondents.

Question #6 - *"If specialty track availability ranked in your top 5 can you please explain what type of track you would be interested in?"* The results of this self-reported question yielded a total of 41 responses from the 82 respondents. The top three specialty tracks of interest that students self-identified were sustainability (51%); BIM (24%); and Project Management (20%).

Discussion

In an effort to create a more student-centric curriculum and to recruit a diverse group students programs must self-assess and they must become advocates for educational transformations that are flexible, diverse, and dynamic. Today's hot topic may not be tomorrows and students are always looking for that edge. Thus there are a series of opportunities available to CM programs that want a dynamic Master's graduate program and a program that is preparing exceptional students within the short 30-36 credit hour window of a CM Master's degree. Among these opportunities, as evidenced by this study, are recognizing the diversity of self-defined curriculum options, professional credential support, and easily navigable websites to locate CM programs that are perceived as meeting student desires.

Self-defined Career Path Opportunities

A significant majority of Master's level CM students (72% of respondents) are intent on enter the construction industry, others continue into addition academic efforts. Many individual master's programs are astutely aware of this consideration without the verification that is evident by this research activity. As such, there are many ways a program can facilitate this endeavor and use it as a recruitment tool and to understand what CM Master's students seek as an academic experience. Among these are valued considerations are diverse opportunities for students, e.g., 1) a program could concentrate on practice-based courses and minimize research-based courses for a majority of the industry track students, 2) it can include research courses for those students identified as pursuing a PhD or further educational opportunities, 3) graduate level field-based internships, with academic credit, could be identified and implemented for, and 4) the offering of opportunities to prepare and seek professional credentials as a component of the degree, either as degree credit, independent study, or internal workshops. This approach can be similar to the Engineer-in-Training prep courses; fundamentals of the bar exam; LEED study courses; or undergraduate, for credit, construction management competition courses being offered by many universities.

Optional Program Tracks

It is evident that today's graduate candidate is interested in topically specific study areas. Graduate programs that adapt to these dynamic needs will reap the benefits of expanded applications and improve recruitment. If desirable, a program interested in increasing enrollment and providing better student experiences should conduct a self-examination to identify areas, within their program, that presents opportunities for improvement, be they a more effective website design, credential opportunities, or specialty option tracks. Program self-examination is important in remaining a progressive program that meets the educational needs of its students in program practices and procedures.

Professional Credential Opportunities

Based on the responses to question #3, there exists an opportunity to integrate professional credential as a recruitment tool and a student-centric component of the curriculum. Although this appears the financial purview of continuing education, there is no reason that these valuable and desirable educational experiences cannot be integrated in practice-based CM programs. One example of a program to achieve the student-centric goal of acquiring a professional credential is to allow academic credit for engaged and demonstrated study of credentialing materials as evidence of knowledge acquisition, even to the point of completing mock examinations. This approach is no different than what many universities allow when students take credit based Engineer-in-Training courses. If the knowledge is of value, programs and universities should assist students in simultaneously acquiring both the knowledge and the certification. Currently many intuitions offer a breath of 12 credit hour graduate credential sequences as a viable academic activity. Allowing knowledge gained in the specific domain while pursuing a degree and also applying this knowledge acquisition toward a professional credential seems a natural like-mindedness.

Program Website Development

The impact that the use of a graduate program's website has on recruitment and ultimate program selection should not go underestimated. A website, that is easy to navigate and quick to find needed candidate information, will either retain the candidate for further inquiry (make the shortlist) or will cause the student to move on to another university program, with a more user friendly website. How many clicks does it take to find what a potential student is looking for? With today's technology, all world class programs must understand that website development and ease of navigability is imperative for presenting the message that each program wants to convey to potential candidates.

Conclusions

Fundamentally the pursuit of a master's degree is a life-changing career path decision and should be addresses much like students do. Speed of completion is paramount for a majority of students polled, as are prerequisites that can be acquired as part of the degree credit hours or made achievable within a speedy duration. As verified by Word-McCormick (2000), speed and convenience are critical to adult learners, who are aware of their objectives and are critically shopping for the best educational experience to change their lives. CM master's programs have a diverse

cliental. This diversity leads to a wide range of contradictory parameter requirements from prospective students and academic administrators including many academics that have never been in the industry. The prospective student's expectations are directly correlated to their personal and professional career goals. ASC graduate education programs have an opportunity to take advantage of increasing enrollment, of prospective students, by focusing on specific student-centric desires. Every program involved in this study, and those that have an opportunity to self-examine their program, should assess how they are communicating their program parameters to prospective students and how they are responding to prospective student needs. A detailed analysis of an academic program, much as many prospective master's students do when selecting a program, programs and students might be able to match best fits in needs and aspirations. Regardless of the desire to market programs and become student-centric all university programs should strive to communicate their ever changing requirements and opportunities in the most transparent, relevant and easily attainable way.

Among future work that may be useful and relevant in continuing the research developed within this study are exploring areas that involve: the differentials in perspective between current and prospective students, examining student-valued choices, both geographically and global, what impact and desirability is of establishing a STEM program designations for the Master's degree, and determining the influence that opportunities in sector focus tracks has on student choices.

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Appendix A – Online Survey

Question #1:

Which best describes your career plans

- Active Duty Military
- Construction Industry
- Academia Career
- Other

Question #2:

How influential on a scale of 0-10 is Internet research in shortlisting your selection of a construction based graduate education program?

Question #3:

How influential on a scale of 0-10 would a professional certification option be in your selection of a construction based graduate education program? For example if a university allowed for you to prepare for and receive a construction related professional certificate for completion credit or exit requirement such as Certified Construction Manager (CCM), Project Management Professional (PMP), or LEED Professional Credentials would you be more likely to choose that university over another that did not offer you that choice?

Question #4:

Rank the following qualities of a graduate program from the most important (#1) to least important (#11) to you when you selected a construction based graduate education program and university. Please drag and drop to order them.

- Prerequisite Requirements
- Enrollment Restrictions (ongoing enrollment vs. yearly enrollment)
- Graduate Student Funding Available
- Exit Requirements (Thesis, Project & Report, Course Work Only)
- Duration of Program
- Type of program (On Campus & Online Options)
- Admission Requirements for Entry (GRE, GPA, Letters of Recommendation)
- Cost per credit hour
- Student Faculty Ratio
- Number of Tenure Faculty
- Specialty Tracks Available (BIM, Sustainability, Real Estate, ETC.)

Questions #5:

Are there any program qualities that are not listed above that you would take into account when determining what construction related graduate program to attend? If so please say what they are and why they are important to you, and where in the ranking would they fall?

Question #6:

If specialty track availability ranked in your top 5 can you please explain what type of track you would be interested in.