

# **Measures of Student Empowerment, Attitude, and Motivation Toward Construction Education and the Profession**

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This study investigates the relationship between student empowerment, attitude and motivation toward construction management course work and professional construction management. The primary purpose of this study is to conduct an investigation of the elements that are influential in forming and predicting the attitude and motivation of students.

**Key Words:** Attitude, Empowerment, Motivation, Construction Education

## **Introduction**

The impetus for this research arises from a general concern with the lack of available instrumentation or measures of student attitude and motivation within construction education. Students' feelings of empowerment or personal control within construction education course work and toward the construction management profession have not been documented within the current body of construction education literature. The primary purpose of this study is to conduct an investigation of the elements that are influential in forming and predicting the attitude and motivation of students. The results of this investigation should provide educators with specific elements that will enhance their instructional strategies and assist in the students' professional transformation.

## **Rationale**

Today, job differentiation, which is created by a specific education-socialization process and reinforced by a distinctive set of skills and language, is the hallmark of a professional and a professional's cultural climate (Bennett & Wittaker, 1994). Cultural values and opinions are developed through maturation, and influence a student's perception and desire to enter into a specific profession. The Wyatt Company survey (1989) associates attitudes and professional values with perceptions of work and careers in society. In a study of self-concept and change, it was found that attitudes are more likely to be affected by the internalizing of public opinions than any other personal trait (Tice, 1992). More often than not, the public's opinion of construction is not generally positive. "If no other work exists, there is always construction." The public culture has not been kind, and we within construction often do nothing to modify the public perception of our public value and commercial success.

Bennett and Wittaker (1994) studied the differences between physical scientists, architects, and engineers. The work of the physical scientist is usually withheld from the public view by being confined to an industrial or academic laboratory space. However, the public was found to express confidence or prestige in the scientific community because it was deemed that a highly trained public determines and reviews their performance (Bennett et al., 1994). Cultural opinion holds high expectations for scientific problem-solving to discover and invent solutions that answer problems (Bennett et al., 1994). Given the cultural emphasis on science in academic programs and society, the pattern of public interest is not surprising.

Allen's study (Allen, 1984; cited in Bennett et al., 1994) states that engineers differ from scientists in their professional activity, attitudes, orientation, and typical family background. The construction related professions of the architect and engineer were described as being publicly related or involved. A high level of aesthetic interest and evaluation of the architecture/engineering type professions was felt to exist in society. If a public or private facility was not within the public's taste, its negative review occurs daily. The study further found that architecture/engineering was being judged by an untrained public culture that has little understanding of the processes involved with an artistic or unstructured solution-focused discipline. The design professions are therefore seen to be fairly open-minded and artistic, but exhibiting a need for acceptance and recognition from a broad public.

Professional construction management has not been evaluated by the public culture to date. However, in some public opinions, professional construction is perceived as mostly including individuals who are stubborn, physical slobs, contractual cheats, sexist, and always unclean or dirty. Cultural understanding about certain disciplines within construction is affected by the information available to the public (Young, 1989; cited in Young and Duff, 1990). Within professional construction, as opposed to the design professions, there is little public evaluation or praise concerning value to the common society. Corner stones, most often, do not list the building's constructor. It often seems attitudes shaped over many years of learning and experience are not usually all that flexible, the impact of negative cultural opinions cannot be disregarded within construction education or profession.

Recently, Sidlik and Pilburn (1993), presented data on the development of a Likert-type instrument which investigated the relationship between student empowerment and attitude toward science. Sidlik et al. provided evidence that indicates a very strong relationship exists between student perceptions of control and attitude toward science and science education. This study reconfirmed the ideology that a classroom climate can be useful in predicting the students' attitudes toward science. Factors of attitude and empowerment in the academic atmosphere were identified as performance and motivation that related to student cooperation/competition and student/instructor control. The assumption of the study was that students were interested in issues concerning the decision-making process in the classroom as they progressed in their scholastic development. The current study borrows from Sidlik and Pilburn's work by choosing their instrument for modification and use in this study. The investigators of this study chose to adapt their instrument rather than develop a new instrument. An adapted instrument borrows the strength of the original instrument's development process, subsequent research, and data analysis into validity and reliability.

Cognitive theory links the constructs of attitude and motivation with the dimensions of intrinsic or extrinsic empowerment. The current study defines motivation as an achievement-related belief that affects goal directed activities in the immediate environment, i.e. gain social recognition, to please parents, or achieve good grades. Attitude is defined as an enduring disposition ...positive or negative... toward a social or psychological object, i.e., feelings of like or dislike, to enjoy or hate, a state of physiological arousal expressed by a value index. The dimension of intrinsic empowerment is defined as the condition where individuals perceive themselves to be engaged in behaviors for their own reasons, i.e., interest in activity, believed to be more enjoyable, individually valued. Whereas, extrinsic conditions exists where the individual perceives themselves to be engaged in behaviors as the result of another's reason, i.e., to please a person in authority, to escape punishment, or to obtain a reward.

This study was to investigate the relationships between student empowerment, attitude and motivation toward construction management course work and professional construction management. Key to this investigation was the identification of those factors that are influential in the prediction of students' feelings of empowerment within their construction course work.

### **Methodology**

The instrument was administered to college students (n=176) taking construction management courses at nine four-year universities. The universities were Illinois State University, John Brown University, Louisiana Tech University, Louisiana State University, North Lake College, Oklahoma State University, Texas A&M University, University of Arkansas, and University of Texas.

The questionnaire is constructed in three parts entitled: 1) Acknowledgment of Participation, 2) Attitude Toward Learning, and 3) Background Information. The acknowledgment gave the intention of the study to the students, and also, required a signature of their consent for participation. The background obtained variables of the colleges construction focus, gender, age, academic major, academic classification, grade point average, whether attended college for construction education, construction work background, time sense last construction employment, perception of management abilities and perception of practical technical abilities. The questions in the survey consisted of thirty items regarding construction course work and construction management. Items were measured on a five-point Likert-type scale: 1 = "Strongly Agree", 2 = "Agree", 3 = "Undecided", 4 = "Disagree", and 5 = "Strongly Disagree". The statements were derived from the instrument *My Science Class* (Sidlik et al., 1993). To modify this instrument for use in our curriculum area the word "science" was replaced with "construction," i.e., in the place of "Science lessons are enjoyable for me" this study used "Construction classes are enjoyable for me," or "I would like to be a scientist some day" became "I would like to be a construction manager some day" (see Appendix A).

A second survey was then conducted at Illinois State University to determine the theoretical category of the thirty questions and to provide construct validity within the modified questions. Professors within the Industrial Technology Department were given cognitive element

definitions and asked to check which elements applied to each question. The results of this instrument are listed in Appendix A.

### **Data Analysis**

A principal component factor analysis on SPSS reveals four factors among items on the instrument Attitude Toward Learning Construction, and has tentatively been labeled: Intrinsic Attitude (Factor 1) 16 items, Group Motivation (Factor 2) 5 items, Extrinsic Motivation (Factor 3) 5 items, and Intrinsic Motivation (Factor 4) 4 items (see Appendix A).

Factor 1, Intrinsic Attitude, is interpreted as seeing, hearing, and experiencing internal beliefs, thoughts perceptions that an individual uses as a measure for succeeding while attempting to achieve their academic or professional goals. Items consist of statements that respondents' appear to feel represent a way individual students have a common persona.

Factor 2, Group Motivation, contains items that mention academic classroom involvement, respect, and togetherness. Students appear to look at their mentors, role models, and peers for self assurance and guidance, which may be a desire for approval, from sources that accept construction management as a profession and discipline. Working with others in the academic environment is perceived as an internal pressure for increasing self-esteem and accomplishing goals. There, then, may be a sign of competitiveness that serves as a check and balance of internal attitudes that have an objective for becoming the best construction manager.

Factor 3, Extrinsic Motivation, comprises items that elude respondents to experience pressure to do well within the scholastic environment (together as a class and individually). Students reveal academic mentor challenge their self-concepts of a construction manager. Academic mentors are respected as in Factor 2 with the exception that now they may be thought of as goal setters and as a first professional construction manager outside source to assess a student's potential. The measure of success appears to have a predictive weight determining a students potential of becoming a construction manager.

Factor 4, Intrinsic Motivation, consists of items reflecting an internal desire to become a successful construction student. Students seem to want to belong to a group working toward a similar goal, that is, to become a construction manager. Peers appearing to have similar goals seem to affect a student's self-concept that construction management is a respectable academic program. As a student senses a need to be part of a group, they appear to develop an internal desire to accomplish tasks expected for becoming a construction manager.

Once factors were labeled, a 4 x 7 stepwise linear regression on SAS was conducted with the continuous variables that would report what elements predict each factor. This procedure estimates the coefficients of the linear equation, involving a set of independent variables, which best predicts the value of the dependent variable. The dependents were means of each of the four factors for each subject. The independent variables were age, construction work background, academic classification, grade point average, time sense last construction employment,

perception of management abilities and perception of practical technical abilities. The data analysis revealed significant prediction for all factors.

Factor1, intrinsic attitude by perception of practical technical abilities yielded a significant correlation ( $F=.0007$ ). Factor2, group motivation by perception of management abilities, age, and academic classification all were significant predictors, ( $F=.0018$ ), ( $F=.0031$ ), ( $F=.0289$ ) respectively. Factor3, extrinsic motivation by academic standing was significant, ( $F=.0325$ ). Factor4, intrinsic motivation by perception of management abilities was significant, ( $F=.0015$ ).

## Conclusions

The prediction within Factor1 indicates that, as a student's perceptions of their practical abilities increases so does their personal attitude toward construction course work and professional construction. This gives support to the practice of programs requiring students to take internships or work at construction during the summer months. Practical experience it seems, is not only the best teacher, but, also provides students with an enduring disposition and excitement toward success in their own course work and profession choice.

Factor2 has several predictors. Two of the variables, age and academic standing, are similar enough to group together. That is, students do get older as their academic careers progress. The data indicates that as students mature and advance toward graduation their belief that goal directed behavior will lead to success increases, as does the perception of their management skills and abilities. This belief is not only held about themselves, but about construction students as a whole.

Factor3 predicts that as students progress toward graduation they will feel more outside pressure to do well in their course work. Students also felt more comfortable with the direction their professors were leading them and the construction program.

Factor4, intrinsic motivation by perception of management abilities predicts that students themselves feel responsible for their own success. They like themselves and the direction they are going professionally.

The overriding indication from this study seems to be that students indeed do enter into the construction coursework with poor attitudes and motivation concerning their educational standing and the value of a construction profession. However, as they progress toward graduation this belief system is modified to be a responsible positive outlook to their future, not only in construction education, but for construction as a profession of choice.

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## Appendix A Factor Analysis

### **FACTOR 1 Intrinsic Attitude**

|    |   |       |       |       |       |           |            |       |            |
|----|---|-------|-------|-------|-------|-----------|------------|-------|------------|
| 1  | Construction classes are enjoyable for me.                                  | 0.64  | -0.02 | -0.07 | 0.39  | Intrinsic | Academic   | Self  | Attitude   |
| 23 | We (the students) feel that construction lessons are enjoyable.             | 0.64  | 0.17  | -0.13 | -0.07 | Intrinsic | Academic   | Group | Attitude   |
| 25 | I would like to be a construction manager some day.                         | 0.61  | -0.22 | -0.09 | -0.04 | Intrinsic | Profession | Self  | Motivation |
| 17 | I like construction more than other students.                               | 0.60  | -0.28 | 0.12  | -0.15 | Intrinsic | Profession | Self  | Attitude   |
| 20 | I like reading about construction in books, magazines, and newspapers.      | 0.60  | 0.11  | -0.07 | -0.12 | Intrinsic | Profession | Self  | Attitude   |
| 19 | Most of the other students in my class like construction.                   | 0.59  | 0.23  | 0.15  | 0.09  | Intrinsic | Profession | Group | Attitude   |
| 14 | I don't like construction classes.*   | -0.57 | -0.10 | 0.16  | 0.22  | Intrinsic | Academic   | Self  | Attitude   |
| 21 | Other students would like me as a business partner.                         | 0.52  | -0.01 | -0.02 | -0.06 | Extrinsic | Profession | Self  | Motivation |
| 2  | We (the students) see this construction class as being worthwhile.          | 0.52  | 0.15  | -0.21 | 0.44  | Intrinsic | Academic   | Group | Attitude   |
| 27 | Technical construction is easy for me.                                      | 0.51  | -0.35 | 0.17  | 0.20  | Intrinsic | Profession | Self  | Attitude   |
| 29 | We (the students) feel that construction courses should be enjoyable.       | 0.49  | 0.16  | 0.04  | 0.14  | Intrinsic | Academic   | Group | Attitude   |
| 8  | We (the students) take a positive attitude toward our construction classes. | 0.48  | 0.39  | 0.07  | -0.11 | Intrinsic | Academic   | Group | Attitude   |
| 26 | Construction is an easy subject for me.                                     | 0.48  | -0.40 | 0.14  | 0.10  | Intrinsic | Academic   | Self  | Attitude   |
| 6  | My friends are better at construction than I am.*                           | -0.46 | 0.35  | 0.09  | 0.28  | Intrinsic | Profession | Group | Attitude   |
| 7  | I think other students in class like construction more than I do.*          | -0.45 | 0.37  | 0.23  | 0.32  | Intrinsic | Academic   | Group | Attitude   |
| 30 | I think other students will make better constructors than I will.*          | -0.41 | 0.36  | 0.25  | 0.31  | Intrinsic | Profession | Self  | Attitude   |

### **FACTOR 2 Group Motivation**

|    |  |      |       |       |       |           |            |       |            |
|----|--|------|-------|-------|-------|-----------|------------|-------|------------|
| 11 | We (the students) respect our construction instructor.   | 0.22 | 0.51  | -0.28 | 0.39  | Intrinsic | Academic   | Group | Motivation |
| 18 | I am better than other students in construction.   | 0.44 | -0.48 | 0.13  | 0.19  | Intrinsic | Profession | Group | Attitude   |
| 12 | We (the students) would like the opportunity to get to work with everyone in this construction class before the end of the semester. | 0.40 | 0.47  | -0.07 | 0.11  | Extrinsic | Academic   | Group | Motivation |
| 5  | I think other students' parents encourage them to do well in construction.   | 0.31 | 0.42  | 0.32  | -0.07 | Extrinsic | Profession | Group | Attitude   |
| 24 | Other students in my construction class spend more time on construction homework than I do.*   | 0.04 | 0.27  | 0.21  | -0.01 | Intrinsic | Academic   | Group | Motivation |

### **FACTOR 3 Extrinsic Motivation**

|    |   |       |       |      |       |           |            |       |            |
|----|---|-------|-------|------|-------|-----------|------------|-------|------------|
| 28 | My construction instructor does not know what I like about construction.*   | -0.12 | -0.13 | 0.69 | 0.12  | Extrinsic | Profession | Self  | Motivation |
| 22 | Our construction instructor does not know what we like about construction.* | -0.17 | -0.21 | 0.62 | 0.03  | Extrinsic | Profession | Group | Motivation |
| 9  | I feel pressure to do well in construction classes.                         | 0.37  | 0.13  | 0.50 | -0.21 | Extrinsic | Academic   | Self  | Motivation |
| 15 | We (the students) feel pressure to do well in this construction class.      | 0.45  | 0.34  | 0.49 | -0.22 | Extrinsic | Academic   | Group | Motivation |
| 4  | We (the students) feel that construction is a waste of time.*               | -0.03 | 0.04  | 0.33 | 0.28  | Intrinsic | Profession | Group | Motivation |

### **FACTOR 4 Intrinsic Motivation**

|    |  |      |       |       |       |           |            |       |            |
|----|--|------|-------|-------|-------|-----------|------------|-------|------------|
| 10 | I get good grades in construction classes.                     | 0.45 | -0.28 | -0.04 | 0.60  | Intrinsic | Academic   | Self  | Motivation |
| 3  | I would like to belong to a student construction organization. | 0.50 | 0.19  | 0.06  | -0.52 | Intrinsic | Profession | Self  | Motivation |
| 16 | Students prefer to work alone in this construction class.*     | 0.17 | -0.28 | 0.19  | 0.45  | Intrinsic | Academic   | Group | Motivation |
| 13 | Constructors like music as much as other people.               | 0.20 | 0.29  | -0.04 | 0.31  | Intrinsic | Profession | Group | Motivation |