

Enhancing Construction Management Retention By Enhancing Communication Skills

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Abstract

Construction management education emphasizes the qualitative and administrative aspects of construction such as contracts, specifications, value engineering, resource management, quality assurance, and quality control. Most of these topics conflict with the demeanor of engineering student who feels more comfortable with problem-solving technique than these humanities-like topics. The instructor of construction management course feels abandoned from the students at the beginning of the semester. The challenge to the instructor is how to convert the students to his side against their habitual learning attitude.

This paper introduces one approach currently being implemented in the Construction Management program at Zagazig University-Benha branch, *Egypt*, to apply the required change. In this technique, the instructor motivates and enhances the communication skills of the students through discussion sessions held once a week after a lecture. The discussion may take the form of a student-led seminar followed by a question-answer session. It may be in the form of student-student discussion or instructor-led discussion. It was observed that the students become more active and involved in the subject and its implementations. The students showed more dedication to the course and to the instructor.

Introduction

In this era, the national development is based primarily on the strength of its infrastructure including transportation, education, health, water resources control, and housing facilities. The subsequent needs are focusing on how to deliver these services in effective capabilities and fully functional manner mean time. Current and anticipated methods of applying technologies in infrastructure delivery systems, construction management, construction engineering, and material engineering urged engineering industry to revolutionize its methodology and practice. These rapid changes in needs and practice demand a synchronous mutation in the engineering education. Particularly, educators need to overcome the traditional perspective of courses with concentrated subjects to widely needed integrated courses and integrated education.

Interdisciplinary education collaborated by communication skills is very important for engineers with managerial functions in their technical ventures and even for engineers pursuing their careers in nontechnical trends. A constant growth of interest in nontechnical education among engineers is commonly observed and reflected in the design of engineering curricula in the United States where some innovative curricula assign as much as 50-60% of the required credits to be fulfilled by free or directed elective courses⁽⁵⁾.

This paper introduces one approach for integrating educational model currently being implemented in the Construction Management program at Zagazig University. In this approach,

an integrated course has been developed at the undergraduate level that vertically integrates basic construction management needs. Also, it presents openings to strengthen and exploit communication skills to prepare engineers for interdisciplinary projects and industry integrated needs. This paper describes the primary constituents of this approach including the integration of course, the cooperation required to support the communication emphasis, and the establishment of a technical/non-technical alliance to provide the industry by the needed quality of engineers.

Integration of Construction Management Course

Based on the industry needs feedback in the previous decades, it is likely for the construction field to employ a newly graduated engineer with higher communication skills and willing to improve her/his knowledge through life-long-education besides the traditional technical capabilities. These aspects are commonly stressed in all branches of the construction industry nowadays. This means that a new approach of integrated knowledge must be induced in the construction education in general and in construction management education in particular to match the fast spreading complex needs for the market.

In the developed construction management courses it is required to widen the perspective of the syllabus instead of concentrating on traditional areas such as planning, scheduling, cost control. It is required to extend the contents of the course to the understanding of the design philosophy, engineering affairs, decision-making methods, and negotiation approaches. It is only with these skills, the young engineers (as well as older engineers) could be able to face the needs of interdisciplinary engineering needs.

Teaching Communication Skills

The objective of a Construction Management curriculum is to prepare staff with abilities to enhance and control production and marketing competence for future needs. In addition to stringent core courses, it is required to replenish students with necessary skills such as communications. In particular, conducting effective discussion is the basis for successful directive managing. Managers need discussion skills in instructing, negotiating, directing, informing, brainstorming, etc.

Learning how to communicate effectively may not be accomplished by learning or reading, but practice is the principal tool for this skill acquiring. Construction management class is an appropriate position to improve the communication skills of engineering students because of its technical/nontechnical texture. This assists the instructor to narrow the gap created from the lecture-type and problem-solving classes that the students are used to.

Most construction management courses in undergraduate level lecture planning, organizing, staffing, directing, and controlling by requiring estimating, contracts, and other basic construction topics to prepare engineers for their future career. Moreover, communications in construction management is required in the form of written style such as reports, letters, requests, etc. It is, also, required in verbal style like in meetings, seminars, presentations, etc. For a construction project, verbal communication starts as early as the conceptual phase of a project starts. It continues through the different phases of the project. Even after finishing the project, it continues for issues such as project close out, dispute resolution, and "lessons learned" sessions.

Why Discussion?

The lecture type of education is advantageous in courses with specific target to conduct. In transmitting-fact courses such as that of the basic science and fundamental courses in engineering curriculum, it is more effective to use lectures than discussions⁽⁷⁾. In other courses like analysis, design, and criticism objectives, lecturing is not the sufficient process to fulfill the required target of the course. In these preeminent programs, with respect to engineering profession requirements, it is needed to stimulate the students' capacities to create, develop, and exploit different ideas through the course. The primary objective, in some cases a partial objective, of similar courses is to enhance and train the personal skills of the student more than pumping routine methodologies into student's mind.

In engineering education, as in many other programs, it is required to raise the mental skills as well as repetitive capacities of the student. Perception is generally deemed as personal talent but it may be enhanced through the different stages of education and practice. Open-ended problems, multiple solutions offered for a single problem, brainstorming, seminars, and discussion are different types for the required improvement of a future decision-maker. The instructor has to find out the appropriate method with respect to the course, subject, type of lecture, duration and time available within the course, instructor characters, reflex of students, and the goals of the course.

Advantages and Disadvantages of Discussion

Whatever the type of teaching used in the course, there should be many advantages and many other disadvantages. In the following session, an evaluation is performed for the discussion type with respect to the main alternative option, which is the lecture type of instructing engineering courses.

Advantages of discussion:

1. Improving students' capacities to make decisions, think critically, analyze, and justify.
2. The students show better retention for the material of the subject.
3. Students become more interactive and more cautious with the course.
4. Enhancement of students' communication skills and ability to express themselves.
5. Changing students' attitude and attraction to the course as well as to the instructor.

Disadvantages of discussion:

1. It is more difficult to prepare and conduct a discussion class than that for a lecture class.
2. Engineering students are neither familiar nor prepared for discussion classes.
3. Discussion class is not convenient with big classes more than fifteen students.
4. Students should have a considerable background of the subject to be discussed.
5. The class could be ineffective if the students are youthful mentally or behaviorally.

Also, it is advantageous to exploit discussion periods to conduct ethical problems that engineers need in their professional life. Besides, it helps the instructor to improve the attitude of the students through the discussion and through the course itself. The nature of ethical issues is attracting different types of opinions and responses from different personalities and creating a productive environment for discussion.

Conducting Discussions

The discussion type of education is rarely used in engineering. In *Egypt*, few courses, in the field of engineering education, may allow the chance for instructor-students, student-centered, or any other type of discussions. These courses are the humanities related courses such as in lawful or ethical subjects, which is the closest part of the offered engineering programs to public life and general knowledge. This type of subjects attracts the students to express themselves and participate with others in discussions. However, engineering students (as well as some of the instructors) underestimate the necessity of these courses. The students' misjudge adds more burden on the instructor to draw students attention to the course and discussions.

It is useful for the successful student-discussion to be based on considerable knowledge. The student should have a supportive background about the subject to be discussed either from the instructor or from variety of readings assigned by the instructor as a guide for the students. This shows that it is more productive for the program to spend part of the time as an instructive session before using the other time as a discussion session. The discussions in the current study were conducted once a week after one of the two weekly classes of the course. The subjects to be handled were picked to serve, support, and clarify the objective of the Construction Management course. The discussion titles were:

1. What is construction management?
2. Phases of construction project life cycle.
3. The importance and aftermath of using quality in construction.
4. Role of construction manager in planning, staffing, and coordination.
5. Responsibilities and duties of students and engineers.
6. Assessment of civil engineering program. (Self-assessment for the students.)
7. Contractor's presentation for a giant contract. (Student-led session)
8. Importance of planning and scheduling in construction projects.
9. Role of construction manager in advising, motivating, and improving.
10. Evaluation of the Construction Management course's subjects.

Participation Quantification

It was required to set a quantification method for the participation of the students in the conducted discussions through the course. A grade out of ten points was assigned for each student in the class depending on her/his participation in the discussion. The grades were rated as shown in Table (1).

The average of the grades will be denoted hereafter as the *participation coefficient*. This coefficient is used to evaluate the development of the students' reflection in the discussion session and the effect of this development on the interaction between the students and the instructor and between the students and the course.

Participation	Grade
No participation	0
Irrelevant contribution	1-2
Weak contribution	3-4
Significant contribution	5-6
Vigorous contribution	7-8
Additive contribution	9-10

Table (1) Quantification Coefficient

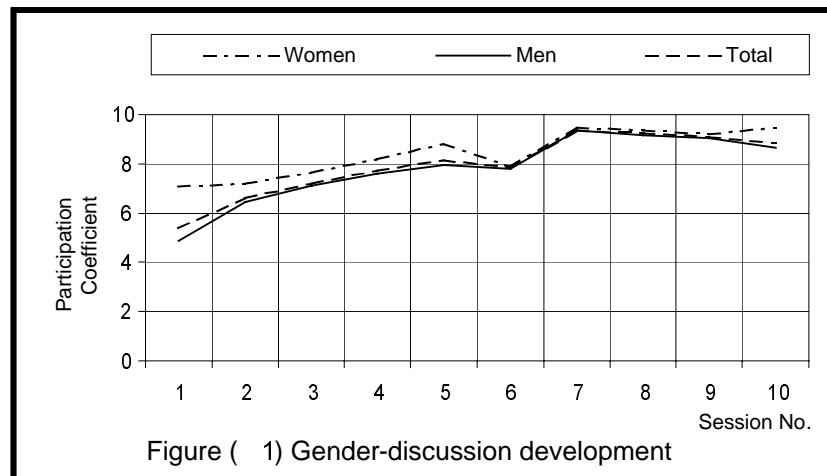
Retention Enhancement

The variation in the students' participation in the discussions as well as their involvement in the course itself was developing as the semester was proceeding. At early sessions, the contribution of the students was introverted that made the early sessions so tough to the

instructor, specially in the first session. The students were rejecting to comply with the new type of education as an education mean or aid. It was more likely to be entertaining period than a scientific class to the students. As the classes went on, the interrelationship between the lecture classes and the discussion classes became more obvious and the interaction between the students and the discussions grew up to be more effective. On the scale shown before, the *participation coefficient* started at about (5) in the beginning rising up to about (9) by the end of the course.

Figure (1) shows the development of the participation of the students as the session ran one after one. It is noticed that the improvement of the students' response was developing gradually except at the sixth and seventh sessions. This degradation may be referred mainly to two reasons:

- The first is having the mid-term examination between these two sessions that drew the attention of the students and turned their main concern in the session before the class to the coming examination.
- The second is the subject to be discussed itself. The students in the developing countries are not used to discuss and evaluate their own issues in public. In addition, the subject is involving their own instructor and other instructors that imply some doubts about the expected reflection to their openness. On the other hand, the later session was concerning a money-wise issue that interest the student as seniors preparing themselves to step into the real life after few weeks.



Men and Women in the Discussion

The response of the men and women was different from that expected according to Tannen⁽⁶⁾. He mentioned that women show less participation than men do in scientific discussions while they show up effectively when the discussion is concerning personal issues. To the contrary, in the current sessions, the fifteen women students were superior to the other fifty-four men students, on the average.

Figure (1) shows the response of the students based on the gender average participation coefficient. Women started more aggressive in the discussions with coefficient of 7.07 against 4.87 for men. At the last session, women recorded average of 9.47 against 8.65 for men. Females were leading all of the sessions but they were almost equal to the average of the men

when the discussion concerned the evaluation of the civil engineering program itself. This result shows the ability of men students to face the real facts with more courage than women students. As Construction Management course, this result points that men students have better capacity in decision making and analysis issues, while women may be better in presentation, at least at their first steps in the real life.

Main Barriers through Discussion Sessions

In addition to the general issues stated in the disadvantages of the discussion, and based on the considered experiment, there are few other specific obstacles usually faced through the discussion sessions. The nonparticipants in the discussion class are excessive load on the instructor. They are the major barriers in conducting the discussions in the early sessions. These students may not be participating because of their improper preparation for the discussion or weakness in their communication capacities. The first reason may be overcome by raising the interest in the course and the discussion session. Also, it is required to encourage and improve the interpersonal relationships between the student and the instructor. The later reason for not participating may be overcome by encouraging the student to share his mates in the group activity by handing him a starting phrase or dragging him by a stimulating question. However, it is always recommended to select the fitting point for this task when it is felt that he is willing to share. This type of students, frequently, enriches the discussions whenever the student has the chance to start involving in the group task.

Another problem that may be faced in the discussion is the conflict between students through the reciprocal conversations. The discussion sometimes converts into personal debate if the session is student-led. In this situation, the instructor has to direct the attitude starting from the earlier sessions to be subjective and follow up with the response of the students even by interfering the students' discussion whenever it is probable that the argument is diverting. It is helpful from this point of view to assign the students in a certain sequence to give their contributions so that the order of the opinions does not allow personal disagreement to intensify. Unfortunately, this action could not take place unless after the defect is rising up to the surface.

Sometimes a student is willing to participate in the activity of the group but he does not have the conforming contribution. If he obstructed by a wandering idea, the discussion may roam away from the target of the session. The problem rises from the follow up of some students who may be attracted to respond for the new idea while others still concentrating on the original concept. In this condition, the instructor have to redirect the discussion to the original path either by pointing that the idea is presumptuous or by dragging the discussion back to the considered subject. The method of correcting the situation depends on how far the new idea is.

Discussion against other Accreditation

The relationship between the recorded *participation coefficient* and the final grades of the course was measured by calculating the statistical coefficient of correlation between the two sets. The calculated coefficient of correlation was 0.67 that does not reflect a strong relationship between the total accreditation of the course and the discussion capacities of the students. Despite that 10% of the total grade depended on the response in the discussion session, this amount has a little contribution to the final grade. The other 90% of the grade depends on the skills of handling and manipulating the examinations, quizzes, and assignments. The corresponding coefficient of correlation with the accumulated grades of the students' engineering curriculum was 0.73. This value is not far from that value recorded for correlation

with the grade of the course. However, it is well known that the construction management industry in need to improve the verbal communication skills of the engineers-to-be. This need urges the grade distribution of management courses to assign higher percentage to communication skills.

Summary

Teaching Construction Management courses needs a specific manipulation from the instructor due to its difference in nature from most of the other engineering courses. Enhancing communication skills for the students helps them to get closer to the material of the course as well as to the instructor helping to improve the retention of the course. Moreover, improving communication skills is one of the stressed points of the practitioners to be enhanced during the engineering study, especially for management courses. Discussion proved to be one of the best methods to enhance communication skills and retention of the material when utilized as teaching aid beside the traditional lecture mode of teaching.

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