

Usefulness of Role-Playing Teaching in Construction Education: A Systematic Review

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Designing and delivering courses that impart essential learning objectives such as problem solving skills, decision making skills, communication skills, teambuilding, and leadership skills are critical for construction education. Considering the complexity of the construction industry, it is of utmost importance to adopt student centered pedagogical strategies for their benefits. One such approach is role-playing teaching that has been successfully implemented in a number of construction programs as well as in various other disciplines. The strategy provides a unique opportunity to the students to assume roles of different project stakeholders and solve real life problems that have been replicated in the classrooms. This paper introduces the concept of role-playing teaching along with the benefits, and also identifies the probable courses in a typical construction program that can be benefitted from the adoption of this pedagogical strategy.

Key Words: Role Playing Teaching, Problem Solving, Critical Thinking, Stakeholder Interaction, Construction Management Education

Introduction

Universities offering construction education first surfaced in mainstream publications only three decades ago. Since then, construction education has experienced significant growth and development in the United States, with recent surveys showing in excess of 100 universities offering construction programs. The growth of construction programs in the United States has created an environment where the teaching and learning processes adopted have become an important consideration. With the growth of construction as an academic discipline, universities strive to employ effective teaching strategies and classroom environments to replicate the dynamic atmosphere typically faced by the construction personnel in their professional life. Since attributes such as problem solving, decision making, teambuilding have been found to be essential for the success of construction professionals, the classroom environments attempt to prepare students with the critical skills necessary in their future professional careers.

The universities tend to focus on pedagogical strategies based on learning outcomes of the students. The learning outcomes that are highly valued by the construction students include creativity, problem solving skills, decision making skills, communication skills, teambuilding, and leadership skill (Biggs and Tang, 2011). Universities are expected to design and offer courses that can nurture the aforementioned attributes in students. Pedagogical strategies used in university teaching identify a number of essential components that can facilitate the desired learning outcomes. These components emphasize the student-centred active learning strategies that can be in the form of (1) problem-based teaching, (2) collaborative teaching, (3) game and simulation based teaching, (4) case study-based teaching, (5) involving students in projects and presentations, and (6) peer-tutoring (Kember and McNaught, 2007). Most of these active learning techniques require enhanced involvement of the students in comparison to that of the traditional approaches. However, this sometimes poses an impediment for the students enrolled in construction programs given majority of the students work in the industry while studying at university, and favour courses that demand less time and effort commitment.

In spite of the additional commitment required from the students, Chandler & Mayer (2001) claimed that students benefit more from active learning environments. Learning outcomes outlined by the individual courses are more likely to be achieved when the adopted pedagogical styles involve active engagement and interaction by the students (Ramsden, 2003). Considering the desired learning outcomes of the construction students role-playing teaching can be a successful pedagogical approach for this stream of education. The goal of this paper was to explore the usefulness of role-playing teaching as a successful pedagogical approach for construction education. The paper provides a brief review of the literature related to common pedagogical strategies that have adopted in construction

programs, and how role-playing can either be implemented in addition to/ replace the traditional type of university teachings. The paper also discusses the rationale for implementing role-playing teaching in various courses offered in a typical construction program. Finally it sheds light on the future study necessary to analyze the effectiveness of role-playing teaching in a construction education.

Role-Playing Teaching

Utilizing the techniques of drama, role-playing teaching is a holistic teaching method that inculcates the process of critical thinking, instigates emotions and moral values, and informs about factual data. Role-playing teaching increases the efficacy of the learning experience and make it more grounded in reality. Driscoll (2005) claimed that role-playing teaching method has been derived from the idea that knowledge is constructed by learners in their attempt to understand their experiences. It is based on the Constructivists learning paradigm where learning is considered as the constructs of understanding developed by the learner through student centered learning. Learning has been defined as a process where knowledge is gained through acquiring information and facts that can be retained and used as necessary. Effective learning extends beyond the traditional exercises of reading and memorizing facts and requires abstracting meaning and gaining a deeper insight of events and situations. Utilization of drama becomes effective in this situation. Through the use of drama and dramatic conventions, a teacher not only conveys the facts and information of a subject, but can also portray a more vivid image of the reality. According to Cherif, et al.(1998) role-playing teaching can be divided into four stages: (1) preparation and explanation of the activity by the teacher, (2) preparation of the activity by the students, (3) role-playing activity to have a better understanding of the situation, and (4) discussion or the debriefing of the whole process.

Commenting on efficacy of role-playing teaching, Poorman(2002) posited that "integrating experiential learning activities in the classroom increases interest in the subject matter and understanding of course content". Involving the students in the process has proven to increase their enthusiasm as claimed by Fogg(2001) who found increased student involvement in his history class which was earlier very boring and monotonous for them. In addition, in this approach students are not mere passive recipients of the instruction materials any more, but actively take part in the process of information exchange. During role-playing teaching, as the students acquire knowledge through problem solving of a realistic scenario it is more likely that the students will be able to abstract the meaning and implement it in professional career when needed (McKeachie, 2003).

The benefits of role-playing teaching have resulted in the use of this pedagogical approach in many areas of main stream teaching. Scholars have extensively utilized and documented the benefits of role-playing teaching in various scenarios: Newman et al.(2003) integrated role-playing simulations through the implementation of fantasy sport programs; Cutler and Hay(2000) used role playing to examine the cultural, environmental, economic, and social implications of a fictitious tourist development in the Cook Islands; Shaw(2004) used role-playing to aid students in understanding the complexities of international relations in peacekeeping operations; Moss(2000) utilized role-playing to teach social work students to construct a visual depiction of interpersonal relationships and react to tragic and complex circumstances surrounding the characters of the storyline that faced discrimination; Giralt-Mas et al.(2005) developed a role play scenario that required groups of students working as external consultants to solve a specific telecommunications issue for a company; Oberle (2004) used role playing teaching in college geography classes; and Morris (2003) mentioned the use of role-playing teaching to teach history.

Role-Playing Teaching in Combination with other Pedagogical Strategies

There are several pedagogical strategies being utilized in main stream university teaching today. Role-playing teaching can either be adopted as the only approach of teaching, or in conjunction with other pedagogical strategies. This section discusses the pedagogical strategies which can be combined with role-playing teaching method to encourage active engagement and interaction among the students.

Problem Based Teaching

Role-playing, which allows students to solve realistic and challenging problems, can also be combined with problem-based teaching that makes the student solve a given problem thus creating an active learning environment (McKeachie, 2003) According to Duch (2001), to make problem-based teaching more effective, the problem must

engage students and motivate them to seek deeper understanding of the concepts being taught. In addition, the problem should be such that the students are forced to make a decision based on the facts and cases, and should be complex enough so that all the team members are included in the thinking process. If role based teaching is incorporated along with problem-based teaching, the students get an opportunity to replicate a real situation that help the students to solve the problem effectively. Within this pedagogical approach, the different team-members adopt the roles of different stakeholders (participants of typical construction projects) and in turn develop a deeper understanding of the scenario.

Collaborative/Cooperative Teaching

This form of teaching strategy is also commonly referred to as team-based teaching. This is a type of teaching in which students work together in small groups to accomplish a common learning goal. To increase the effectiveness of the process, the memberships of the teams should not be rigid, where each student is working with the same group of students. The whole process should be carefully planned and executed. When role-playing teaching is combined with team-based teaching it proves to be more effective especially in the disciplines where multiple stakeholders come together to work in a single venture and then disband to work in the next one.

Games/Experiments/Simulations Based Teaching

Games, experiments and simulations can provide rich learning environments for students. Students today have grown up playing games and using interactive tools such as the internet, smart phones, and other appliances. Games and simulations enable students to solve real-world problems in a safe environment and at the same time enjoy the process. This form of teaching has received much attention in recent decades (Long, et al., 2009). In addition to improving their problem solving skills, students get an opportunity to develop their team-building skills. Scholars have commented in favor of benefits of working in a team environment (Lycke, et al., 2006), especially in dynamic discipline such as construction, which is an interdependent and complex industry.

Pedagogical Strategies in Construction Education

Traditional university teachings are often not capable of providing students with all the skill sets and knowledge necessary to solve the real-world problems encountered in construction industry (AbouRizk and Sawhney, 1994). It has been found that the most widely adopted pedagogical approach used for conveying knowledge in majority of the construction programs is the traditional teaching methods that includes lectures, seminars, and tutorials to expose the students to applied science courses (Sawhney, et al., 2001). Sometimes the knowledge is also conveyed in fragments using a series of courses with limited or no opportunities for students to interact with construction professionals to gain practical experiences of a real life situation (Fruchter, 1996, Fruchter, 1997). To rectify the aforementioned shortcoming, visits to construction sites or site training became more popular and it constantly complemented the conventional classroom instructional tools. However, according to Sawhney et al.,(2001) there are other inherent complexities which sometimes make it impossible to rely on the sites visits. For example, the availability of a project, the desired phase of the project, and the risk associated with large group of students visiting a construction site cannot be controlled by the instructor (Echeverry, 1996). AbouRizk and Sawhney(1994) also discussed about the high cost and risk involved with site training, which is another impediment of utilizing site visits for the purpose of construction education. Computer games and simulation have the potential to complement construction education, and expose the students to complexities of real life construction scenarios.

In order to counter the drawbacks discussed previously, various innovative student centered pedagogical approaches have been adopted in construction education. Some common examples are problem-based teaching, use of computer games and simulation, playing of construction site videos in class, internships and trainings. The use of computer games to foster construction education was first suggested by Au and Parti(1969) for teaching planning and scheduling of construction projects. Use of computer games for construction education was first utilized by Halpin(1976) through a gaming system called ‘CONSTRUCTO’ that gave the students an opportunity to plan, control and supervise a hypothetical construction project. Other computer games had also been developed that are used to replicate contract negotiation scenarios (Dudziak and Hendrickson, 1988), and construction bidding scenarios (AbouRizk and Sawhney, 1994).

Problem-based teaching can also be adopted in construction education. In addition to efficient delivery of knowledge as in traditional university teaching, problem-based teaching provides a synthesis of knowledge, problem solving skill, and also critical thinking to solve real life problem. In an experiment performed on problem-based teaching in a construction program Williams and Pender (2002) concluded that the combined use of traditional and problem-based teaching methods in the courses showed efficient use of staff resources and an effective and motivating learning environment for student. Local employers also suggested that the use of problem-based learning for final year students produced graduates with the knowledge, skills, confidence, and self-reliance necessary to make a successful transition from university to industry.

Role-Playing Teaching in Construction

As multiple stakeholders are typically involved in any construction project, it is the duty of the construction manager to manage and supervise all of them and solve critical problems. Thus role-playing teaching that replicates the real life scenario by assigning different roles to the students provides the students with valuable realistic experience. It provides them an opportunity to build on their communication skill as well as synthesize the knowledge they have been taught and apply it. Being an active learning model, role-playing teaching encourages the students for increased involvement. Considering the uniqueness of construction projects, majority of the decisions taken my project participants cannot be distinguished as right or wrong. The decisions taken have to be evaluated based on particular situations and resources available. Thus, role-playing teaching trains the students to get accustomed to real life scenarios by placing them in similar ones. One main advantage of role-playing teaching is that it encourages individuals, while acting in the role, to reflect upon their knowledge of a subject and act accordingly. Thus, when adopted in construction education, role-playing teaching will provide the students rehearsal of reflecting upon their knowledge on a subject to make effective and good decisions.

According to Jarvis et al.(2000) role-playing teaching gives life and consistency to academic material that can be largely descriptive and/or theoretical. Since it is very important for construction personnel to apply the theoretical knowledge in the practical field every day, it is extremely beneficial for the students to have a practice of that skill in a class room setting through the use of role playing teaching.

Construction Management Subjects and Role-Playing

The following section discusses about some of the courses of construction education in which role-playing teaching could help the student get a better understanding of the theoretical subject with a realistic flavor.

Introduction to Construction: This course is designed as an introductory course where the students are given an overview of the aspects of construction management including the relationships among different stakeholders, construction documents, estimating, scheduling, project management, safety, materials, and other relevant subjects. Adoption of role-playing teaching for this course will enable different students to play the roles of the different stakeholders, and interact with each other as they would in a real life project. They could perform all the duties involved in a construction projects in those roles, and that would help them to synthesize and abstract the knowledge they have gained and perhaps retain more in comparison to what they have done in traditional university teaching.

Ethics in Construction: This course introduces the students to the required moral values and expected professionalism within the construction industry. The course discusses about the ethics and the ethical practices that are adopted in the construction industry today. Rather than providing the students with information as in the traditional method of teaching, if the students play the roles of the different stakeholders of a real construction project, they can get more involved and experience the dilemmas that are common in the professional career.

Construction Safety: This course talks about the practices that should be adopted to maintain a safe and hazard free environment for construction site personnel. Rather than teaching the students the rules and regulations to maintain a safe construction site, it will be more helpful if the students themselves play the roles of the different participants involved in a construction project and practice how they should or should not do certain things on a job site. It has been found by scholars that in most of the time the students are able to retain more, if they face the situation themselves and takes decision accordingly.

Future Research

As a subsequent step to this paper the authors are planning to perform an experimental study to investigate how role-playing teaching can improve understanding of a subject among the students and provide them with the necessary skills to be successful in future professional career.

Conclusion

Learning outcomes of the courses offered by the construction programs strive to educate the students with problem solving skills, decision making skills, communication skills, teambuilding, and leadership skill in addition to the theoretical knowledge. However, construction being a dynamic and complex industry makes it challenging for the instructors to impart the theoretical knowledge in typical classroom settings depending on lectures, seminars, and tutorials. As with various other disciplines, construction has also adopted various student centered teaching techniques among which role-playing teaching is one of them. Utilizing the techniques of drama, role-playing teaching is a holistic teaching method that inculcates the process of critical thinking alongside teaching factual data. This pedagogical strategy can be implemented all by itself or in conjunction with other student centered teaching strategies. The selection and implementation of the strategies are completely dependent on the instructors.

Due to the inherent complexity, and involvement of multiple stakeholders in the construction projects, role-playing teaching can be proved to be an effective teaching strategy. With a flavor of drama, this teaching strategy enables the students to put themselves in the shoes of different stakeholders and then engage in class participation. The primary benefit of the approach is increased involvement of the students and at the time helps them synthesize the knowledge by role playing. Seeing the benefits of the approach, numbers of universities have adopted this approach. This paper summarized the concept of role-playing teaching and depicted the different benefits. In specific context of construction education, the paper identifies some of the construction courses where role-playing teaching can be effectively utilized. The authors are currently in the process of conducting an experimental study to investigate the efficacy of role-playing teaching and how the strategy can help students synthesize and retain more in comparison to that in traditional university teaching.

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