

Effectiveness of Role-Playing as a Pedagogical Approach in Construction Education

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The purpose of this study was to determine the effectiveness of role-playing teaching as a pedagogical approach for construction management educators in achieving educational objectives. Role-playing has been used as a pedagogical approach for many years mostly in sports education, theater, history and other social science disciplines. 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. The paper presents the results of an experimental study where one group of students was taught using role-playing and the control group was taught using traditional approach. Results indicate that students taught using role-playing demonstrated a better understanding about the subject matter and showed more positive attitude towards construction as a profession. Based on the results, the paper argues that role-playing teaching meets the needs of construction management educators who are attempting to offer students an active learning environment that balances theory and practice while equipping students with the skills necessary to be successful in the profession.

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

Introduction

Role-playing is being used as a pedagogical approach for many years, predominantly in sports education, theater, history and other social science disciplines. 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. It has been found that role-playing teaching increases the efficacy of the learning experience and makes it more grounded in reality ([Pierce & Middendorf, 2008](#)).

The most widely adopted pedagogical approach used for conveying knowledge in majority of the construction programs today is the traditional teaching methods that include lectures, seminars, and tutorials to expose the students to different aspects of construction ([Sawhney, Mund, & Koczenasz, 2001](#)). In addition to traditional methods, other forms of active learning pedagogical approaches adopted in construction education include construction site visit, site trainings, computer games and simulations, and problem-based learning. Though role-playing is not a popular pedagogical approach adopted in construction education, it has major benefits and potentials for improving students' learning ([Bhattacharjee & Ghosh, 2013](#)). Due to the involvement of multiple stakeholders in any construction project, role-playing teaching method that replicates the real life scenario by assigning different roles to the students can prove to be very effective in construction education.

This paper discusses about an experimental study to identify the effect of role-playing teaching on students' learning outcomes. Two sections each consisting of 25 students of construction management in a Midwestern University were used as samples for the study. One of the sections was taught using traditional methods, while role-playing was utilized for the other. The paper illustrates about the differences in the learning outcomes and attitudes towards construction as profession between the two sections of students.

Literature Review

The study was initiated with a systematic literature review on the use of role-playing teaching as an effective pedagogical approach, and its effectiveness in construction education.

Use of Role Playing as a Pedagogical Approach

The benefits of role-playing teaching have resulted in the use of this pedagogical approach in many areas of mainstream teaching. Scholars have extensively utilized and documented the benefits of role-playing teaching in various scenarios: Newman, Irwin, Klenosky & Gillentine (2003) integrated role-playing simulations through the implementation of fantasy sport programs; Cutler & 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, Pala-Schonwalder, del-Aguila-Lopez & Bonet-Dalmau (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.

Commenting on efficacy of role-playing teaching, Poorman (2002) stated 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. Additionally, in this pedagogical 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 absorb the meaning and implement it in professional career when needed (McKeachie, 2003).

Relevance of Role Based Teaching to Construction Education

Traditional methods of teaching 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 & Sawhney, 1994). 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, 1997). To rectify the aforementioned shortcoming, visits to construction sites or site training became more popular that 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 site 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 simulations have the potential to complement construction education, and expose the students to complexities of real life construction scenarios. In order to counter the aforementioned drawbacks, various innovative student centered pedagogical approaches have been adopted in construction education. Some common examples are problem-based teaching, use of computer games and simulations, playing of construction site videos in class, internships and trainings, and similar. 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 students.

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 of construction management program valuable realistic experiences. It provides them an opportunity to build on their communication skills 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 by project participants cannot be distinguished as right or wrong. The decisions taken have to be evaluated based on the light of the situations and resources available. Role-playing teaching trains the students to get accustomed to real life scenarios by placing them in similar ones.

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](#)). 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. Role-playing teaching also has added merits when combined with team-based teaching in the disciplines where multiple stakeholders come together to work in a single venture and then disband to work in the next one. Role-playing combined with games and simulations received much attention in recent decades as it enable students to solve real-world problems in a safe environment and at the same time enjoy the process ([Long, Mawdesley, & Scott, 2009](#)). In addition to improving their problem solving skills, students get an opportunity to develop their team-building skills ([Lycke, Grottum, & Stromoso, 2006](#)).

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, Odell & Troiano ([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.

Adoption of Role Based Teaching Method to Teach Introductory course in Construction

Bhattacharjee & Ghosh (2013) discussed about probable construction management courses where role-playing teaching could be adopted as a successful pedagogical approach. This study describes how role-playing was adopted to teach an introductory course on construction management. In this course the students were 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 topics. Adoption of role-playing teaching for this course enabled 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 helped them to synthesize and abstract the knowledge they have gained and perhaps retain more in comparison to what they would have done under traditional teaching.

Two sections each consisting of 25 students in the Construction Management program of a Midwestern University during the Fall 2012 were taught the introductory course on construction management, using the same course material but different pedagogical approaches. One section was taught using traditional teaching method such as lecture notes, readings from the book, and individual assignments. The other section of students was taught the same course using same course material but using role-playing pedagogical approach. Within the role-playing teaching approach, students were grouped into teams where each student played the role of a specific stakeholder involved in any construction project. When a new topic was introduced to the class, the student teams were provided with a real life project scenario and were asked to analyze the situation within their team from the perspective of the stakeholders they were representing. The following section gives a detailed description of the method adopted for the study followed by the discussion on the results of the study.

Research Method

This study was based on a pre and post survey of individual students who were enrolled in the introductory course on construction management that was taught using traditional teaching method or role-playing teaching method. The survey documented data on their learning outcomes and their attitudes towards the profession of construction. Questions were designed to evaluate the extent to which the role-playing teaching assisted in achieving the stated learning outcomes.

Participants

50 students (divided in two sections of 25 each) enrolled in the introductory course on construction management during the Fall of 2012 were included in the study.

Instrument

A paper based questionnaire was developed to conduct pre and post surveys among the two sections of the students. Pre and post survey method has been used and proved to be successful to analyze the effectiveness of courses in various academic disciplines ([Hake, 2007](#)). A focused listing format was utilized to count the number of responses for the pre and the post survey which have been proved to be a successful measure ([Angelo & Cross, 1993](#)).

The questionnaire consisted of 17 questions grouped into three different sections related to their academic major and current standing, level of knowledge about construction management and the construction industry, and their attitude towards construction as a profession. The first section included two questions asking about their current standing and academic major. The second section had 10 questions testing the knowledge of the students on construction management and the construction industry. This section served as an assessment tool for the background knowledge review, which proposes a “sense of how much and how well they have learned the material” ([Angelo & Cross, 1993](#)). The third section had five questions asking the students about the importance of acquiring knowledge and communication skill, developing personal and ethical standards, being a self-starter and self-learner and possessing leadership skill. The survey used various types of questions, including Likert-type, multiple-choice, and open-ended questions.

Data Collection and Analysis

The first survey questionnaire was handed out to the students at the beginning of class on the first day of the semester before they had any chance to discuss about the subject with the instructor. The same questionnaire was handed out to the student on the last day of the semester, right before their final exam. The students were given 15 minutes to complete the survey questionnaire on both the instances. The same questionnaire was used for the pre and post surveys for both the sections to rule out the limiting factors like difference in previous knowledge levels of the students, difference in the levels of intellectual ability of the students of the two groups.

Data analysis included descriptive statistics with a report of the appropriate means to describe the responses to the questionnaire items as well as the background characteristics of the respondents. The difference of the mean scores of the responses from the pre-test to the post-test of the experimental group was compared with that of the control group.

Results

Background Characteristics

Majority of the students in both the experimental (84%) as well as the control group (88%) were freshman (as shown in Table 1), with a handful of sophomore and junior students. This was expected as the course under consideration was an introductory course offered to students majoring in construction management, and had to be taken during their freshman year. Students from related disciplines such as architecture, interior design, and similar could also enroll for the course. However, the students from related disciplines usually used to enroll in their sophomore or junior years. Thus the students other than freshman were not majoring in construction management.

Table 1
Background characteristics of respondents

Items	Groups	Respondents Who Received Role-Playing Teaching (Experimental Group)	Respondents Who Did not Receive Role-Playing Teaching (Control Group)
		N(%)	N(%)
Respondents' academic standing	Freshman	21 (84)	22 (88)
	Sophomore	3 (12)	2 (8)
	Junior	1 (4)	1 (4)
Respondents' academic major	Construction	21 (84)	22 (88)
	Non-Construction	4 (16)	3 (12)

Knowledge about Construction Management

The mean scores of the responses of the pre and post tests for both the groups were computed and compared. As shown in Table 2 below, the average of the difference of the pre and post score for the experimental group was greater than that of the control group. As all the conditions except the teaching method applied was different, it can be concluded that the improved performance of the experimental group was due to the role-playing teaching. In nine out of 10 questions involving knowledge of construction management, the differences in case of the experimental group were higher. In the experimental group, the highest difference between the pre and post test score was seen in identifying the 'functions of construction manager.' It will not be unfair to assume that role playing by the students helped them to understand the roles of a construction manager in construction project. Interestingly, for the control group the highest difference between the pre and post test scores were found in identifying the different stages of a construction project. That difference is the only one higher than that of the experimental group. In multiple instances, as the Table 2 shows the pre test scores for both the groups were comparable. But, the post test scores for the experimental group was higher in majority of the cases emphasizing the notion that role-playing teaching had a positive impact on the learning outcomes of the students.

Table 2
Mean scores for Pre and Post test of Construction Management Knowledge

Items	Experimental Group			Control Group		
	Pre Test	Post Test	Diff.	Pre Test	Post Test	Diff.
List the major sectors of the construction industry	1.8	3.6	1.8	1.9	2.5	0.6
List the primary players of a typical construction project	2.7	4.2	1.5	2.4	3.8	1.4
List the different delivery methods used in construction industry	0.9	3.2	2.3	1.1	3.1	2.0
List the functions of a construction manager	2.4	5.7	3.3	2.8	4.2	1.4
List the different types of contracts used in construction industry	1.3	3.8	2.5	1.4	2.7	1.3
List the different stages of a typical construction project	2.2	4.5	2.3	2.1	4.7	2.6
List the factors that impact the project cost	3.1	5.4	2.3	3.5	4.2	0.7
List the different types of schedules used in construction projects	0.6	2.2	1.6	1.1	2.5	1.4
List the factors impacting project performance	2.1	4.7	2.6	1.9	3.8	1.9
List the functions of a safety manger in construction project	1.9	3.1	1.2	1.5	2.5	1.0
Average			2.14			1.43

Attitude towards Construction as Profession

Similar approach was adopted to identify the effect of role-playing teaching on the attitudes of the students towards construction as a profession. The average of the differences of the pre and the post test scores of four questions out of five were more for the experimental group in comparison to that of the control group (as shown in Table 3).

Table 3

Mean scores for Pre and Post test of Attitude towards Construction as Profession

Items	Experimental Group			Control Group		
	Pre Test	Post Test	Diff.	Pre Test	Post Test	Diff.
Acquiring knowledge/skills for lifelong learning is important	3.4	4.8	1.4	2.9	4.3	1.4
Verbally communicating clearly and effectively is important	2.8	4.2	1.4	3.1	4.0	0.9
Developing personal and ethical standards is important	3.1	4.8	1.7	3.0	4.2	1.2
Ability to learn on own is important	2.7	3.9	1.2	2.8	3.8	1.0
Apply leadership concepts to build and manage productive teams is important	2.2	4.8	2.6	2.1	3.9	1.8
Average			1.66			1.26

Conclusion

As traditional university teachings are often not the most effective way of providing students with all the skill sets and knowledge necessary to solve the real-world problems encountered in construction industry, educators should research on identifying effective pedagogical strategies to improve student learning. Students graduating from a construction management programs should acquire the problem solving skills before they face the same when working in the industry. In addition the students should have a fair amount of idea about the profession before they are exposed to the real world. Educators should continue their search on the different ways to improve students' ability to successfully analyse and solve real world problems. Moreover, if more data is published on the scholarship of teaching and learning in construction management, educators can establish benchmark (Moss, 2000) for student learning and the use of pedagogical strategies. Further, educators can also collaborate on the improvement of various teaching strategies in the classroom.

In conclusion, construction management educators are encouraged to implement role playing in teaching introductory construction courses. Role playing meets the needs of construction management educators who are attempting to offer students an active learning environment that balances theory and practice while equipping students with skills necessary to make decisions. Problem based learning if adopted with role playing for analysing real life cases will allow students to develop critical thinking and logical reasoning skills. The results from this study illustrate that students demonstrated improved learning outcome and broader perspective on the attitude towards the profession as a result of participating in the role-playing activities.

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