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A Real-World Ready (RWR) Initiative to Engage Students in Conducting Construction Safety Research

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Abstract: Construction Safety is one of the core courses in the Occupational Safety, Health, and Environment (OSH&E) Bachelor of Science degree program at Southeastern Louisiana University. This course addresses the application of management principles, communication and human relations factors, safety/health rules, industry and federal standards, accident investigation, and technical issues especially within the job planning phases in the construction industry. The Real-World Ready (RWR) initiative is designed to prepare students for a professional life after academics by providing authentic learning opportunities that connect academic courses with real-world experience. The final project serves as the experiential-learning component for Construction Safety. Students are first "randomly" assigned in groups to each construction company. The contact person of each company assigns a specific topic to each group. The company provides necessary information to the students through field trips to the company's construction site as well as opportunities of visiting the company's office, interviewing the company's employees, attending the company's safety and/or project meetings, etc. The students then conduct the quantitative and qualitative analyses on the assigned topics/issues, and present the study in the third unit of the class when the company's representatives are invited. The contact person may present his view of the issue and his evaluation of the student groups' work. The student groups are required to submit a written report, following the guidelines for final project. The reports are to be sent to the companies so they may keep a record. Students' performance in the Spring 2016 semester was analyzed for the present case study. Seven of the eight groups met or exceeded the expectations based on the rubric for final project evaluation. Sample topics include: safety incentive program for Company A, drug testing for Company B, etc. The contact person from one of the companies attended the final project presentation and provided constructive feedback to the students. A survey was handed out at the end of the semester, collecting information about students' evaluation of their group members for the final projects. The results seemed to indicate that the RWR initiative was an effective way to engage students in conducting construction safety research.

Keywords: construction safety, real-world ready

1. Introduction

Construction Safety is one of the core courses in the Occupational Safety, Health, and Environment (OSH&E) Bachelor of Science degree program at Southeastern Louisiana University. This course addresses the application of management principles, communication and human relations factors, safety/health rules, industry and federal standards, accident investigation, and technical issues especially within the job planning phases in the construction industry.

Construction industry presents a variety of safety and health related hazards and/or hazardous conditions (Broderick, 2004; Schneider, 1994). The statistics from BLS (Bureau of Labor Statistics) indicate that the rates of occupational injuries and illnesses among construction workers are generally higher than the average of all industrial sectors every year (BLS, 2015). Therefore, it is desired that safety, health, and environmental professionals clearly understand the essentials of construction safety and health, and be able to apply the principles of safety, health, and environment to anticipate, identify, analyze, and control workplace hazards within the construction industry.

The Real-World Ready (RWR) initiative at Southeastern Louisiana University is designed to prepare students for a professional life after academics by providing authentic learning opportunities that connect academic courses with real-world experience. Experiential learning provides opportunities for students to practice in a setting that is authentic to advancing their intended careers. These learning opportunities are current, pertinent, performance-based, practical applications of

knowledge and skills experienced within the curriculum. Experiential learning falls into categories that vary by discipline and academic major including, but not limited to: internships, service-learning, undergraduate research, civic engagements, study abroad/away, field experiences, creative activities, practice, hands-on learning, mentoring, leadership training, student teaching, and apprenticeships (Southeastern, 2017).

The final project serves as the experiential-learning component for Construction Safety. Students are first "randomly" assigned in groups to each construction company. The contact person of each company assigns a specific topic to each group. The company provides necessary information to the students through field trips to the company's construction site as well as opportunities of visiting the company's office, interviewing the company's employees, attending the company's safety and/or project meetings, etc. The students then conduct the quantitative and qualitative analyses on the assigned topics/issues, and present the study in the third unit of the class when the company's representatives are invited. The contact person may present his view of the issue and his evaluation of the student groups' work. The student groups are required to submit a written report, following the guidelines for final project. The reports are to be sent to the companies so they may keep a record.

The present case study is aimed to examine the effectiveness of the RWR initiative as a way to improve the process of engaging students in conducting construction safety research.

2. Methods

Students' performance in Construction Safety during the Spring 2016 semester was analyzed for the present case study. A rubric (Table 1) was used for grading of the final project. Thirty-two students enrolled in the class. They were randomly assigned to a total of eight 4-person groups. Seven of the eight groups were able to connect with construction companies. One group was not able to find a construction company; but, it eventually connected with a manufacturing company that contains a fair amount of fall hazards which are the leading cause in the construction industry. Their project on analyzing fall hazards and recommending control measures was thus considered meeting the requirements.

A survey (Appendix A) was handed out at the end of the semester, collecting information about students' evaluation of their group members for the final projects. It was also used a tool to assess the effectiveness of RWR component as well as the functionality of group project. Its purpose was to identify the shortcomings of RWR component and team members, and to improve the experience with RWR component and group work.

Table 1. OSHE 382 Rubric for Final Project Evaluation

Performance Consideration (Maximum Points)		**Below Expectations 1**	**Progressing to Criteria 2**	**Meets Criteria 3**	**Exceeds Criteria 4**	**Score**
Technical Report (90)	Content (60)	Inconsistent or few details that may interfere with the meaning of the text.	Some details but may include extraneous or loosely related material.	Provides adequate supporting detail to support solution/argument.	Provides ample supporting detail to support solution/argument.	
	Organization (15)	Little evidence of organization or any sense of wholeness or completeness.	Little wholeness or completeness, though organization attempted.	Organization pattern is logical & conveys wholeness and completeness with few lapses.	Organization pattern is logical & conveys wholeness and completeness.	

	Presentation (15)	Limited or inappropriate vocabulary & incorrect grammar and syntax for intended purpose.	Limited & predictable vocabulary, perhaps not appropriate & some grammar and syntax mistakes for intended purpose.	Uses effective language and appropriate word choices & makes minor grammar and syntax mistakes for intended purpose.	Uses effective language, appropriate word choices, and correct grammar and syntax for intended purpose.	
Oral Presentation (60)	Quality (30)	Inconsistent or few details & nothing worthy to keep.	Some details but may include extraneous or loosely related material & no creative design or informative learning.	Provides adequate supporting detail to support solution/argument & something worthy/new to learn.	Provides ample supporting detail to support solution/argument & many creative designs and informative learning.	
	Professionalism (15)	Does not follow the rules of formal presentation & standard English.	Generally does not follow the rules of formal presentation & standard English.	Generally follows the rules of formal presentation & standard English.	Consistently follows the rules of formal presentation & standard English.	
	Time Control (15)	Finishes presentation in less than 5 minutes or more than 20 minutes.	Finishes presentation in less than 10 minutes or more than 15 minutes.	Finishes presentation within 10-15 minutes but has to either slow down or speed up as	Finishes presentation within 10-15 minutes properly.	

3. Results

Seven of the eight groups met or exceeded the expectations based on the rubric for final project evaluation. Exemplary projects include: safety incentive program for Company A, drug testing for Company B, etc. The contact person from one of the companies attended the final project presentation and provided constructive feedback to the students. The feedback that focuses on the delivery of presentation includes:

- Familiarization with brief
- Know the target audience and deliver to their level
- Use of notes not common, information being read from the slides
- Practice and be prepared to answer questions
- Use more statistics and dollar amounts to show emphasis and support, i.e., OSHA fines, Insurance costs, FMLA costs, Equipment Delays, Retraining, etc.

Table 2 summarizes the students' responses to the first seven questions of the survey. It appears that most of the responses indicated positive participation from the students.

Table 2. Students' Responses to the First Seven Questions of the Survey

Questions	1	2	3	4	5	NA
Has the student attended team meetings?	0.0%	0.0%	10.0%	20.0%	30.0%	0.0%
Has the student made a serious effort at assigned work before the team meetings?	0.0%	3.3%	10.0%	26.7%	60.0%	0.0%

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Has the student made a serious effort to fulfill his/her team role responsibilities on assignments?	0.0%	0.0%	3.3%	33.3%	63.3%	0.0%
Has the student notified the teammate if he/she would not be able to attend a meeting or fulfill a responsibility?	0.0%	0.0%	6.7%	13.3%	76.7%	3.3%
Does the student attempt to make contributions in group meetings?	0.0%	0.0%	3.3%	26.7%	70.0%	0.0%
Does the student listen to his/her teammates' ideas and opinions respectfully and give them careful consideration?	0.0%	0.0%	0.0%	26.7%	73.3%	0.0%
Does the student cooperate with the group effort?	0.0%	0.0%	0.0%	13.3%	86.7%	0.0%

Note: 1 – Never; 2 – Rarely; 3 – Sometimes; 4 – Usually; 5 – Always; NA – Not Applicable

In terms of the overall rating of the final project, 20% of the students rated "Excellent," 36.7% selected "Very Good," 33.3% chose "Satisfactory," and the "Ordinary" rating accounted for 10.0%. Typical answers to the question, "The best things that I have learned from this group project," include:

- How to efficiently work with other people on a given task
- How construction companies actually handle safety
- The role specific JSAs save employers on time
- Leadership roles, organization

Answers to the question, "The lessons that I have leaned," include:

- Communication is very important.
- The importance of self-identifying hazards in your workplace
- Time management
- How to work with the differences of others

4. Discussion

Overall, the majority of students seemed to gain a positive experience of conducting construction safety research through the RWR initiative. Although Spring 2016 was the first semester that the RWR component was added into the class, assessment of the experiential learning has been conducted since Spring 2008 when the author started teaching the class. It would be interesting to compare the differences of students' feedback in different semesters, so that the pros and cons of the RWR initiative could be better documented in order to improve student's knowledge and skills about construction safety.

5. References

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Appendix A: OSHE 382 Final Project Evaluation Form

The following evaluation for OSHE 382 final project is a tool to assess the effectiveness of RWR component as well as the functionality of group project. Its purpose is to identify the shortcomings of RWR component and team members, and to improve the experience with RWR component and group work. Be consistent in rating by using the guidelines below.

1 – Never; 2 – Rarely; 3 – Sometimes; 4 – Usually; 5 – Always; NA – Not Applicable

Please circle your responses.

- Has the student attended team meetings? 1 2 3 4 5 NA
- Has the student made a serious effort at assigned work before the team meetings? 1 2 3 4 5 NA
- Has the student made a serious effort to fulfill his/her team role responsibilities on assignments? 1 2 3 4 5 NA
- Has the student notified the teammate if he/she would not be able to attend a meeting or fulfill a responsibility? 1 2 3 4 5 NA
- Does the student attempt to make contributions in group meetings? 1 2 3 4 5 NA
- Does the student listen to his/her teammates' ideas and opinions respectfully and give them careful consideration? 1 2 3 4 5 NA
- Does the student cooperate with the group effort? 1 2 3 4 5 NA

Based on your responses to these questions, assign an overall rating on the following scale:

_____ (Insert one of the given words.)

Excellent Consistently carried more than his/her fair share of the workload
Very good Consistently did what he/she was supposed to do, very well prepared and cooperative
Satisfactory Usually did what he/she was supposed to do, acceptably prepared and cooperative
Ordinary Often did what he/she was supposed to do, minimally prepared and cooperative
Marginal Sometimes failed to show up or complete assignments, rarely prepared
Deficient Often failed to show up or complete assignments, rarely prepared
Unsatisfactory Consistently failed to show up or complete assignments, rarely prepared
Superficial Practically no participation
No show No participation at all

The best things that I have learned from this group project are: _____

_____

The lessons that I have leaned include: _____

_____

Other Comments: _____

_____

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