

It's Elementary: Promoting the Construction Industry to Children

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It's a Friday afternoon in a kindergarten classroom. The twenty-six students sit on the carpet eagerly waiting. This is not any normal Friday. This is construction day! The kids squeal with delight when the eight construction teachers enter the classroom. However, these are not traditional teachers. These are two faculty members and six students from Ball State University's Construction Management program. During the next two hours, the kindergarteners learn about construction, practice construction skills, and learn about the importance of continuing their education after high school. At the end of the day, one kindergartener told the classroom teacher, "This was the best day of my life."

These eight individuals spent an afternoon teaching kindergarteners about construction to help address the severe construction workforce shortage in Indiana and across the nation. As the Baby Boomer generation begins to exit the workforce, the construction industry will face a substantial workforce shortage. Multiple strategies exist to help combat this shortage. One strategy to help cope with this workforce shortage is to introduce careers in construction to children. This article highlights the elementary school outreach initiative developed by the construction management program at Ball State University in Muncie, Indiana. The goal of this program is to introduce elementary school students to the construction industry and to careers in construction at a young age.

Rationale for the Program

As the Baby Boomer generation begins to exit the workforce, an estimated 17% of the construction workforce nationwide will retire in the next five years (BYFI, 2015). Additionally, the number of construction workers aged 35 to 44 will also decrease. As a result, the nation needs to train an estimated 275,000 construction professionals per year to deal with growth and attrition in the industry (Whyte & Green, 2015). All of this data indicates that the construction industry could soon be in a workforce crisis. In the midst of this workforce shortage, projections show that the amount of annual construction work will continue to increase. Getting students engaged in and excited about the construction industry is crucial in order to find qualified candidates to fill the positions in these industries.

The data for the construction industry workforce in Indiana is similarly bleak. In Indiana, the average age of someone working in the construction industry is 48. In Indiana alone, there will be a projected 61,000 construction career opportunities by August 2017. Without enough construction workers, projects can't be built. Public perception of careers in construction is often negative. The construction industry is often viewed as a career with low pay, high danger, a lack of education, and poor working conditions. In reality, these stereotypes are incorrect. Careers in construction are viable and often lucrative employment opportunities. Some states, including Indiana and Alabama, have developed statewide programs, Build Your Future Indiana and Go Build Alabama, to work with high school students to help address this workforce shortage (BYFI, 2015). An additional strategy to help address this workforce shortage is to introduce careers in construction to children.

The elementary outreach program highlighted in this article engages both Ball State University's construction management faculty and students in communities in east central Indiana. In recent years, much attention has been focused on higher education's role in communities and in serving the needs of society. However, higher education institutions involvement in society is not new.

Since Harvard was founded in 1636, part of the role of higher education institutions was to work for the public good (Bringle & Hatcher, 2002). Though working for the common good is not new, in the late 1980s and early 1990s, higher education institutions were criticized for not being involved in the community and not using their resources to assist with community, social, and national issues, such as education, the environment, and economic development (O'Meara, Sandmann, Saltmarsh & Giles, 2011). To address this criticism, many higher education institutions have faculty apply their knowledge and expertise to local, regional, and national issues through community engagement and service. Community engagement is community based faculty work. According to the Carnegie definition, community engagement is a "collaboration between institutions of higher education and their larger communities (local, regional/state, national, global) for the mutually beneficial exchange of knowledge and resources in a context of partnership and reciprocity" (Driscoll 2008, p. 39). According to Wade and Demb (2009), professional service includes when faculty use their expertise to address or assist with real-world problems, issues, interests, or concerns. Additionally, the missions of most higher education institutions include a public service component, and faculty help to fulfill that component through community engagement. This community engagement and service contributes to the public good of society and also supports the mission of the higher education institution.

The Elementary Outreach Program

In 2015, the Construction Management program at Ball State University in Muncie, Indiana developed an elementary school outreach program for students in the surrounding community. The goal of this program was to introduce children to construction at a young age. Ideally, the children who participate in the program will develop an interest in construction, continue to explore that interest through high school, and then consider a career in construction, either in the skilled trades or management level positions. The elementary school outreach program included hands-on presentations where students learned about the different types of construction, construction safety, the fact that girls can work in construction, and about the skills that are needed to work in construction. The students also practiced certain construction skills, like measuring, hammering, sanding, or even building a small project. Community partners during the first year of the outreach program included College Mentors for Kids, the Girl Scouts, and several local elementary schools in east central Indiana. The feedback from the students and the teachers was very positive.

In the summer of 2016, the elementary school outreach program was expanded to include Let's Build, a five session summer program with the Ross Center, a community center in the Muncie community. This center is a neighborhood center that provides summer and after school programming for students of all ages. The programming efforts are primarily designed for elementary school students. The center's director was interested in adding more hands-on activities to the center's summer programs. To meet that need, the construction management faculty developed a five week program called Let's Build.

During the first summer of implementation, Let's Build worked with an average of 10 students each week. The students ranged in age from kindergarten to fifth grade. The students who participated in the program varied week to week, but the ratio of male to female students was consistent at approximately 50 percent. All of the elementary students were from the local community, and most lived within walking distance of the community center. The Let's Build

curriculum was developed (Appendix A), and the students spent one hour each week learning about various aspects of construction. Over the course of the five week program, the students learned about the different types of construction, the importance of construction safety, how to use basic tools, the career opportunities in all aspects of the construction industry, and about the skills needed to be successful in the construction industry. Students had the opportunity to apply the skills they learned each week through hands on activities. The majority of the weekly lessons incorporated learning centers or stations. Using learning centers allowed the students to work in small groups and gave each student sufficient time to practice each construction skills. For example, the stations for one weekly lesson included:

- Measuring lines on a worksheet and measuring various objects in the classroom
- Hammering into Styrofoam using golf tees and then actual nails
- Sanding using pre-cut blocks of wood and sandpaper
- Assembling small airplanes using basic wood supplies to practice building skills

At the end of the program, each student built a small toolbox to incorporate all of the skills they learned during Let's Build.

Because of its importance in construction, safety was incorporated into the lesson each week. On a weekly basis, students reviewed the different pieces of personal protective equipment (PPE) used in construction. During the course of the program, the students wore personal protective equipment including hard hats, safety vests, and safety glasses. The beginning of each Let's Build session also included a stretch and flex activity, which is a common occurrence on job sites. This activity provided time for the Let's Build instructor to reiterate the importance of safety and also gave the elementary students time to focus and prepare for the Let's Build program.

Due to the strong positive feedback from the community center and elementary school students involved in the program, Let's Build was expanded in the fall of 2016 to include more elementary school students in addition to using construction management students as Let's Build leaders and teachers.

Lessons Learned

As with the development of any new program, challenges and areas for improvement were identified for this outreach program. Having committed volunteers for the elementary school outreach program is critical. In the construction industry, safety is stressed as a top priority. That is no different when working with actual tools with a group of 10-20 elementary school students. When working on building small projects, such as the toolboxes built by each Let's Build participant, having one to one student to volunteer ratio is ideal. Having that ratio ensured that the tools were used properly, that the toolboxes were built correctly, and that safety was stressed at each step of the building process. In addition, with a greater number of volunteers, more complex projects can be built. The number of volunteers should be highly considered when developing curriculum such as that used in this elementary school outreach initiative.

Differentiating lessons for various grade levels is also critical. To date, the elementary school outreach program has worked with students ranging from preschool to fifth grade. Some of the student groups involved with the program were all from the same grade level, while other groups included students from multiple grade levels. Based on the first year and half of the program,

having students from the same or similar grade levels leads to more success with these types of hands-on activities. Granted, ability levels will still differ from students even in the same grade, but having students of similar ages and ability levels makes the program run more smoothly. When developing a program like Let's Build, program planners must also consider the knowledge and abilities of the student groups who are participating. A key to working with elementary school children is keeping them engaged and keeping them involved. Developing curriculum that is age appropriate is critical. For example, a lesson used with several groups was building airplanes using clothespins and popsicle sticks. While the kindergarten and first grade students highly enjoyed that activity, third grade students found it boring and did not stay engaged. Program planners should review national education standards and work collaboratively with elementary school teachers to ensure that the curriculum is grade level appropriate.

Ideas for the Future

Due to the continued success of the Ball State construction management program's elementary outreach initiative, Let's Build and similar programs will continue in the future. The program has evolved since it was first developed, and additional ideas and plans are being considered for the future. For the short term, Let's Build will continue to offer programming to elementary school students. A long term goal is to extend the reach of the program and develop additional construction related programming for students in middle and high school.

The program was designed to teach lessons that do not require many financial resources. To date, the program has been funded by the construction management program, private donations from individual donors, and a small grant from Ball State University supporting community outreach initiatives. Additional funding sources will be identified and pursued to help sustain the program. Additional funding could help extend the reach of the program, assist with curriculum development, and allow the program to include larger and more detailed lessons.

Since its implementation, the elementary outreach initiative has already partnered with multiple community organizations. However, with twenty-two elementary schools, two community centers, and multiple organizations that offer after school programming in the local community, the possibilities to expand the program are great. In the future, the program plans to work with additional community partners with the goal of working with at least two new community partners each academic semester. Plans are already in place for Let's Build to continue as part of the current community partner's programming in the summer of 2017. By working with additional community partners, the reach of this initiative will expand. Hopefully, this will influence more students to consider careers in the construction industry.

One of the immediate short term goals for Let's Build is to develop a program evaluation. Though feedback from all groups involved with the program was positive, no formal evaluation for Let's Build has been developed. A longitudinal evaluation to determine if the elementary students involved in the program eventually pursued careers in the construction industry would be an ideal form of program evaluation. However, completing such an evaluation presents several challenges, including tracking elementary age students over a long term time frame, as most of the elementary students involved with the program will not be entering the workforce for at least a decade. Program planners can work with the community partners for assistance in developing a program evaluation strategy for this initiative. Local school systems could be another potential source for obtaining data, especially if those schools track the career paths of their graduates. Program planners can also work with universities and construction professional

organizations with similar community outreach efforts to determine effective methods to evaluate the program.

Conclusion

Since its implementation in 2015, this elementary outreach program has been a successful example of community engagement between Ball State University's construction management program and the local community. Since long term tracking is difficult, determining if any of the elementary students who participate in the program pursue careers in the construction industry is challenging to determine. However, with a potential workforce crisis looming for the construction industry, initiatives such as this to help increase interest in careers in construction are needed to attempt to lessen the impact of the workforce shortage.

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Appendix A

Sample Program Outline for Primary Grades Let's Build Program

Week 1:

- Overview of construction
- Overview of four types of construction
- Overview of construction safety
- Overview of types of PPE (personal protective equipment) used in construction
- Activity: stretch and flex
- Activity: drawing pictures of potential construction projects

Week 2:

- Review of construction and construction safety
- Overview of construction materials
- Activity: stretch and flex
- Activity: practicing sanding
- Activity: practicing measuring
- Activity: building small airplanes

Week 3:

- Review of construction and construction safety
- Overview of construction documents
- Discussion of skills needed to be a successful construction professional
- Activity: stretch and flex
- Activity: create spec book cover pages
- Activity: take pictures wearing construction PPE
- Activity: practice hammering
- Activity: building with Play doh

Week 4:

- Review of construction, construction safety, and skills needed to be a successful construction professional
- Activity: stretch and flex
- Activity: build toolboxes

Week 5:

- Review of all key concepts from the first four weeks
- Overview of punch lists
- Activity: stretch and flex
- Activity: assemble Let's Build spec books
- Activity: decorate Let's Build picture frames
- Activity: Let's Build program punch lists