Recruiting for Undergraduate Packaging Programs at Christian Brothers University

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Abstract – Most high school students have never considered packaging engineering as a career due to lack of information on packaging programs and its career opportunities. Consequently, Christian Brothers University (CBU) has developed various recruiting activities for both high school students and college freshmen to attract students to its undergraduate packaging programs. This paper discusses these activities, which include after-school workshops, internal packaging information sessions, egg-drop and balsa crate competitions, and promotional materials for packaging.

Keywords: Packaging, recruiting, high school activities, outreach programs

INTRODUCTION

The Institute of Packaging Professionals (www.IoPP.org) lists Christian Brothers University (CBU) as one of 15 packaging programs in the United States. CBU started its packaging program with an elective course in spring 2001 [1]. Currently, it offers an undergraduate packaging certificate [2], a B.S. in engineering management with a packaging concentration [2], and a M.S. in engineering management with a packaging concentration [3].

Most high school students have never considered packaging engineering as a career due to lack of information. Consequently, CBU hosted two corrugated packaging summer programs in June 2008 [4] and an after-school corrugated packaging workshop for high school students in November 2007, under a grant from the International Corrugated Packaging Foundation (www.ICPFBox.org) [5]. Due to demand from high school students, the workshop was repeated in January 2008. Another after-school medical device packaging workshop was offered to high school students in November 2008 under a grant from the Medtronic Foundation. As with the corrugated packaging workshop, it will be repeated in January 2009 due to demand. In addition, internal packaging information sessions have been held on campus since spring 2008, and an annual high school competition has been hosted since

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2002. This paper discusses these and other recruiting activities that CBU has used to attract students to its undergraduate packaging programs and provide information to them on packaging as a career.

ANNUAL COMPETITIONS

An annual egg drop competition has been offered since 2003 as part of the School of Engineering's Annual High School Competitions. This event has been well received. The objective is to design "green" packaging using renewable materials to contain and protect raw chicken eggs from breaking when dropped from a height of 16 feet or more. The final packaged container must fit inside a 3-inch cube. The time allowed for insertion of the egg into the packaging is limited to 30 seconds. If multiple packages survive the highest drop, they are scored as follows: drop-height/weight ratio (85%) and innovation of cushioning design (15%). There have been between 80 to 100 entries each year. A 60-foot man-lift from a Memphis-based crane company makes the event exciting to students.

An annual balsa wood crate competition was added in 2007. The goal is to design a crate with a 6 inch x 7 inch footprint and 5 inch height from ¼ inch balsa wood and Elmer's white glue. Each crate must include a 2 inch square opening on the top side. Crates are tested to failure using a compression table, and the crate with the highest load/weight ratio wins. About 20 crates have been entered each year.

From the experience hosting these competitions over the years, it has been observed:

- Competitions always draw attention from students
- Cash awards for winners make the competitions more exciting
- Offering the same competition over multiple years draws students back in subsequent years with improved entries
- Being consistent with the competition date and the date of rules announcement allows high school physics teachers to include these competitions as part of class projects
- Bringing in professionals for judging competitions strengthens industry relationships, which can lead to future support and cooperation

Figure 1. Pictures of Packaging Competitions

CORRUGATED PACKAGING AFTER-SCHOOL WORKSHOPS

A three-hour after-school corrugated packaging workshop was offered on November 6, 2007, for 28 high school students under a grant from the International Corrugated Packaging Foundation. Due to demand, the workshop was repeated on January 24, 2008, for another 28 students. The two workshops attracted a total of 30 high school freshmen, 17 sophomores, 7 juniors, and 2 seniors, from six area high schools as well as home school.

Students were first introduced to corrugated packaging with a 15-minute presentation. They then worked in small groups to design a corrugated box using ArtiosCAD software. Their designs were sent to a sample table, which cut the box from a corrugated cardboard sheet. Students then folded the cut cardboard to make a box, which was strengthened at some key locations with glue. The box then underwent various tests, including drop, vibration, shock, and compression tests. The session ended with a panel discussion on career opportunities given by local packaging professionals. The workshop also provided pizzas, drinks, and door prizes. Seventy percent of participants turned in their feedback form. Ninety-two percent of those who responded to the survey indicated that they would recommend the workshop to other students, while 26% said they would consider packaging as their college major.

Some observations from the two corrugated packaging after-school workshops are:

- Compared to the week-long summer programs offered in the past, after-school workshops are more effective. They attract more students and are well received, with less preparation effort required.
- Typically recruiting workshops at CBU are offered free of charge to students. However, a small $5 registration fee was charged for the two packaging workshops. Students had to make a special effort to get a check from their parents and mail their registration in, rather than submitting a free on-line registration. This helped ensure that only students who were serious about attending the workshop registered, and most registrants attended the workshops.
- The registration fees were used to pay part of the cost for pizzas and drinks as well as door prizes (which included an iPod Shuffle), which made the workshops more fun.
- Students loved the hands-on activities as well as the opportunity to discuss career opportunities with packaging professionals.
- Most students who attended the two workshops were not senior in high school. This gives CBU a great opportunity to bring them back to different packaging-related workshops in subsequent years. A student who spends more time visiting the campus is more likely to enroll at the university.

Figure 2. Pictures of Corrugated Packaging Workshop

MEDICAL DEVICE PACKAGING AFTER-SCHOOL WORKSHOPS

Due to the success of the corrugated packaging workshops offered during the 2007-2008 academic year, a medical device packaging workshop was offered on November 13, 2008, under a grant from the Medtronic Foundation. There were 30 students from nine area high schools and home school, including 9 freshmen, 5 sophomores, 8 juniors, and 8 seniors. Due to demand, at the time of this writing it is planned to repeat this workshop on January 22, 2009.

Hands-on activities included edge and burst tests, demonstration of altitude and temperature/humidity chambers, producing a clam shell package from a thermoforming machine, plastic package trimming, and pouch sealing. As in the previous workshops, a career opportunities session presented by packaging professionals followed the hands-on activities. Pizzas, drinks, and door prizes were also provided.

Seventy-three percent of participants returned the feedback form. All said they would recommend the workshop to other students, while 18% said they would consider packaging as their college major. Similar observations can be found under the Corrugated Packaging Workshop section above.

Figure 3. Pictures of Medical Device Packaging Workshop

INTERNAL PACKAGING INFORMATION SESSIONS

Since spring 2008, a two-hour internal packaging information session has been held each semester. The goal is twofold: (1) to provide undecided college freshmen information on career opportunities in packaging, and (2) to provide an opportunity for packaging students to interact with packaging professionals.

Each session consists of a panel discussion of packaging professionals and information from a faculty member regarding packaging programs offered at CBU. The session in fall 2008 was co-sponsored by the Mid-South Chapter of the Institute of Packaging Professionals (IoPP). The organization arranged panelists based on job functionality. Pizzas, drinks, and door prizes (donated by ACH Food Company) were provided for the past two workshops. IoPP also used the fall 2008 session to discuss the possibility of forming an IoPP Student Chapter on campus. A session is being planned for spring 2009 in collaboration with TAPPI, Inc. (www.tappi.org), a packaging trade organization that promotes pulps, papers, and corrugated packaging. High school students who participated in previous packaging programs at CBU will also be invited to the spring 2009 packaging information session.

PROMOTIONAL MATERIALS

In January 2008, Plastic Ingenuity, Inc. (www.plasticingenuity.com) of Cross Plains, Wisconsin, donated a thermoforming machine to CBU. Along with the machine, the company also donated materials, covered the cost of rewiring the power supply in our lab, and made a model to produce a clam shell plastic package for housing promotional materials for our packaging programs. The package has space for a three-fold brochure, a DVD/CD, and a stick pen. A DVD was developed to show the state-of-the-art packaging lab equipment available at CBU, its program, and the campus. To date about 300 promotional packages have been given out to high school students and counselors as well as packaging professionals. After all, an attractive promotional package is most appropriate for selling a packaging program. The package has been so well received that some other departments at CBU are developing one for their own programs.

Currently, an automobile windshield sticker that promotes packaging programs at CBU is being developed with the assistance of a packaging printing company. As with most programs in the Internet age, the CBU packaging program also has a website (www.cbu.edu/engineering/packaging) that contains extensive information about its programs and activities.

Figure 4. CBU Packaging Promotional Package

IMPACT ON PACKAGING PROGRAMS

The impact of these recruiting activities on our packaging programs is difficult to assess. Many of the student participants are high-school freshmen and sophomores, meaning that it takes a few years before they enter college. On the other hand, the impact of our internal packaging information sessions is more immediate, since they were delivered directly to college students. Below are some of the indicators showing the impact of the recruiting efforts mentioned in this paper on our different packaging programs.

Packaging Engineering Certificate: Enrollment in the packaging engineering certificate program has doubled, from five students during the 2007-2008 academic year to eleven students in the current 2008-2009 academic year. However, there is no guarantee that all of them will finish the certificate program. Most of these students are either chemical engineering or mechanical engineering majors. The enrollment figures are based on enrollments in the two key packaging courses, ChE/ME 319 Principles of Packaging and ChE/ME 320 Distribution/Medical-Device Packaging. These students have already had a materials-related course in their engineering curriculum, which is counted toward the materials elective requirement for the certificate program. The only additional requirement they need to complete the packaging certificate is a packaging project, which could be incorporated into their chemical or mechanical engineering senior design project. Those who decide not to do this have the option of returning after graduation to finish up the project requirement if they would like to earn the packaging engineering certificate.

B.S. in Engineering Management (Packaging Option): This new degree program was announced during the 2007-2008 academic year. Currently, there are three students in the major. One is a new freshman directly entering the program, while the other two are transfers from other engineering programs. This is in line with our expectations that the program would initially pick up mostly transfer students from other engineering programs. It is quite common for an engineering program to lose about 20-30% of its freshmen to business or liberal arts programs. The B.S. in Engineering Management (Packaging Option) gives students the option to stay in a program closely related to engineering. It should be noted that CBU also offers an Information Technology Option for the B.S. in Engineering Management, which is also starting to pick up engineering students who would traditionally switch majors to business or liberal arts.

M.S. in Engineering Management (Packaging Option): Even though this program is not the main focus of this paper, the promotional package mentioned earlier has been distributed at various meetings of area packaging professionals. Consequently, most of them have become familiar with our M.S. program. As a result, we have received many inquiries about it and currently have one student in the program. The student has an undergraduate business degree and is working for a packaging firm in Memphis.

Fall 2008 Tracking Study: A tracking study was performed on high school students who attended the recruiting activities funded by the International Corrugated Packaging Foundation during the fall of 2008. Only students who would be in college were contacted via email. Five out of nine (56%) students applied to CBU, and three of these five (60%) are currently CBU students. The summer programs and workshops are very effective in recruiting students to the university. However, none of the program participants are in a packaging program at CBU or other colleges. Even so, one of the three students at CBU (a mechanical engineering major) may choose to pursue our Packaging Engineering Certificate in addition to his ME degree during his junior/senior years. Another of the three students (a business major) may switch to our B.S. in Engineering Management (Packaging Concentration) or pursue a double major such as B.B.A. and B.S.E.M. As the data is based on only nine students, it is hard to make a solid conclusion on its impact. More tracking studies are being planned to assess other recruiting activities.

A general feedback form is given to participants at the end of each recruiting event. However, the questions are geared toward measuring students' awareness about certain subject areas and how the event could be improved. As expected, about 20-25% of students indicated they might be interested in choosing packaging as their career. It is difficult if not impossible to isolate the impact from different recruiting activities. The most important thing to consider is getting the word out to the community that packaging is a viable career option and that CBU offers several packaging related programs. A student who attends one of the recruiting activities might not end up in the

packaging program, but his/her word of mouth might attract a friend to a packaging program. The best indicators are the enrollment figures in the different programs as shown above. It is expected that enrollments will increase over the next few years due to our recent recruiting efforts.

CONCLUSION

The inherent difficulty in starting a new program is magnified if the area is not well known to high school students. Packaging is a major industry that offers tremendous job opportunities. One can enter packaging from engineering, materials, business/management, and graphic design. Because of its interdisciplinary nature, it is hard to develop a packaging program that covers everything. Thus, CBU offers various packaging related programs, including a Packaging Engineering Certificate for engineering students and a B.S. Engineering Management (Packaging) for those leaning toward business/management. A new Bachelor of Fine Arts in Graphic Design (Packaging) is under development to attract students who are more artistically inclined. Getting the word out to high school students and counselors is critical to a new program such as packaging. Fortunately, the packaging industry is eager to support such recruiting efforts.

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Dr. Malasri is a professor of civil and environmental engineering. He received his Ph.D. from Texas A&M University. His background includes construction management, structural engineering, solid mechanics, material testing, artificial intelligence, and optimization. He was instrumental to the establishment of the packaging engineering program at CBU during his term as engineering dean from 1999-2005. Currently, he serves as packaging activities coordinator. He has been on editorial boards for the *International Journal of Engineering Education* and *Journal of Professional Issues in Engineering Education and Practice*. His recognitions include Outstanding Engineer of the Year (Tennessee Society of Professional Engineers), Award of Excellence (Memphis-Area Joint Engineers Council), Distinguished Lasallian Educator (CBU), and Douglass J. Thomas Chair in Engineering (CBU).

Asit Ray, Ph.D.

Dr. Ray is a professor of chemical engineering at CBU. He earned his Ph.D. from Lehigh University and has over 20 years of teaching/research experience at Auburn and CBU. Dr. Ray spent seven years in the polymer industry, and was four times a NASA/ASEE Summer Faculty Fellow engaging in polymer research at NASA Kennedy Space Center and Langley Research Center. He is actively engaged in laboratory research in polymeric and biomaterials in collaboration with professors from the University of Memphis and Rhodes College and has published over fifteen refereed papers. Dr. Ray co-teaches packaging classes with Mr. Yongquan Zhou. He also serves as the Coordinator of the Packaging Engineering Certificate and Lab at CBU. He was recognized as the 2003 Featured Engineering Faculty by the School of Engineering at CBU.

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Mr. Zhou is a project engineer in Packaging Design and Development at FedEx Corp. and is an adjunct faculty for the School of Engineering at CBU. He received his B.E. in packaging engineering and M.E. in mechanical engineering from the Wuxi Institute of Light Industry in China, and his M.S. in packaging science from the Rochester Institute of Technology. He is currently working on his Ph.D. at Mississippi State University. Mr. Zhou is a Certified Packaging Professional (CPP) with more than 20 years of experience in the packaging industry, academic classrooms, and research and testing laboratories. Mr. Zhou serves on various IoPP, ASTM, and ISTA technical committees, and was an IoPP AmeriStar Packaging Competition judge from 1997 to 2001. He has published articles in *Packaging Technology and Engineering* and other magazines.

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Dr. Ventura is an associate professor and Chair of Electrical and Computer Engineering Department at CBU. He is a senior member of IEEE and a professional registered engineer in Mississippi. He received a Bachelor of Science in Electrical Engineering from Christian Brothers College, a Master of Engineering from the University of Florida, and a Ph.D. at the Graduate School of Computer and Information Sciences at Nova Southeastern University in Fort Lauderdale, FL. Dr. Ventura designed and built a manufacturing facility for Mebane Packaging Corporation, a manufacturer of folding cartons, in Greenville, MS. IEEE and CBU recognized John as the 2006 Featured Engineer of the Year, and the Tennessee Society of Engineers recognized him with the chapter-level and state-level 2006 TSPE Distinguished Service Awards.

Paul Shiue, Ph.D.

Dr. Shiue is a professor and chair of the Mechanical Engineering Department at CBU. He received his B.S. from Tatung University in Taiwan and his M.S. and Ph.D. degrees from the University of Memphis. He is an associate member of the American Society of Mechanical Engineers and a professional member of the American Society for Engineering Education. Dr. Shiue is also a member of the editorial advisory board of the *International Journal of Engineering Education* and served as guest editor of a special issue in manufacturing engineering education. He was five times a NASA/ASEE Summer Faculty Fellow at Marshall Space Flight Center. Currently, he is focusing on concurrent engineering and design through manufacturing and product realization processes.

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Dr. Davila obtained his bachelor's degree in mechanical engineering at Princeton University in 1978. He obtained a master's degree in mechanical engineering at Stanford University in 1980, specializing in thermosciences. During 1980 and 1981 he worked at the University of Puerto Rico's Center for Energy and Environment Research. In 1990 he finished his Ph.D. at the University of Texas at Austin. His dissertation involved wind-tunnel experiments on transition to turbulence in the wake of a flat plate. He taught mechanical engineering courses in Nicaragua as a volunteer with the organization Science for the People in 1990 and 1991. In 1991 he moved to Switzerland and married Nicole Christen. He worked as a research assistant at the Ecole Polytechnique Federale de Lausanne in 1993 and 1994. He taught at the University of Puerto Rico (1994-1999), the Interamerican University of Puerto Rico (1999-2001), the University of Vermont (2001-2005), and Trinity College (Hartford, Connecticut, 2005-2007). Since the fall of 2007, he has been an associate professor of mechanical engineering at Christian Brothers University.