Learning Product Quality and Manufacturing Processes through Hands on Learning: Introducing Gaming into the Fashion Classroom

Laura Kane, Mount Mary University, USA

Keywords: Pedagogy, Product Analysis, Product Quality

The purpose of this activity was to integrate active learning into the teaching of apparel product manufacturing and quality assurance in the classroom based on Wang's (2004) *Total Quality Management* game design previously implemented in the teaching of mechanical engineering. The students completed a two day hands on activity designed to mimic the production of a small functional product. One of the student learning outcomes of the class is the understanding of manufacturing procedures, evaluating product quality, and the role of costing throughout the design process. This activity was designed to integrate learning for several learning outcomes of the class.

Students were split up into five groups: four groups serving the role of manufacturers, and one group serving as the customer group. Over the course of two class sessions the students designed a unique product based on customer requests, developed a production line, and executed finished products to present to the customer for evaluation. The customer group would then select the winner of the game based on the execution and quality of the product. The class consisted of Design and Merchandising students. Each group was made up of five students.

The activity began with the customer group working together to select a product that the manufacturers were tasked to produce. Once a product was chosen they then had to develop evaluation and quality standard that would be used to evaluate the manufacturer's products. The customer group in the class came up with a fashion department branded coffee cozy that was durable, adjustable to a number of different sized cups, and had a fashion element to it. Their quality guidelines included staying within their designated budget, durability, and functional. The product had to be something they could execute using only basic hand crafting tools (glue guns, scissors, tape, etc.).

The manufacturing team consisted of five roles: CEO, Marketer, Designer, two Process and Production Engineers, and an Inspector. The role of the CEO was to make final decisions on all design ideas. The marketing agent was the only point of contact with the customer, and was in charge of selling the product to the customers at the end of the production phase. The designer sketched out the teams ideas for the product and solved any potential design problems. The Product and Process Engineer was tasked with developing the layout of the production process and logistics of execution. The inspector was in charge of evaluating the products as they came

off of the production line. Each manufacturing group had to work together to develop their unique coffee cozy design. The students had one day to designate roles, design the product, develop a sourcing plan, and design a production line. They had the weekend to obtain materials for production which began the following class period.

During the day of production students had five minutes to assemble their production line before the clock started. After the 15 minute round was up students took their products to the customers. Students were given feedback from the customers about their design choices, material choices, and the function of the products. If the manufacturing team did well the customer group "paid" more for the product. Each marketer returned to their group with customer feedback in order to make changes for round two. At this point manufacturers were given five minutes to regroup. At this time several groups changed their design, the layout of their manufacturing, and solved functionality problems that came up during round one. At the end of the second round every group was able to produce nearly twice as many products as they had the first time. At the end of the activity the customer group selected which group they thought did the best. They choose the the team that had produced the fewest total number of products but showcased the highest quality and execution overall. This group also used their feedback the most effectively.

During the activity the instructor stood off to the side, answering clarifying questions and letting the students engage with each other and the activity as much as possible. At the end of the winner selection the instructor debriefed the class, asking the class several questions about the project, connecting what they had learned during the activity to what they will be learning the rest of the term. The instructor also provided feedback sheets for the students to fill out asking about the positives and negatives of the activity and if they felt the activity helped them learn about the concepts introduced in the beginning of the course. The feedback was overwhelmingly positive, with almost every student indicating that they were able to better understand the importance of the different roles in the production process. The students also reported enjoying getting to work with each other so closely, as previous lecture courses left them little time to socialize and get to know each other. The debrief was also seen as an important step.

Limitations of the project arose in the role of the customer group. While the customer group had an important task at the beginning and end of the production process, they were often left with little to do during the 30-40 minutes of production time. In future iterations of this game additional roles and tasks will be given to the customer group to enhance their learning and integration with the rest of the class

Wang, G. G. (2004). Bringing games into the classroom in teaching quality control. *International Journal of Engineering Education*, *20*(5), 678–689.