

IBM Semiconductor Challenge

Implementation Stories from AM PBL Field-Testing Teachers

State: Rhode Island

Institution: High School

Grade level: 9th-12th grade

Course: Computer Repair

Class size/group size: 13

Details of Implementation:

The IBM Challenge was given in my Computer Repair class over two weeks. In this class my students typically work on projects for manufacturing and computer problems so this Challenge fit in as a component of the curriculum. I allowed the Challenge to be largely student driven after I showed the videos, but I also wanted the Challenge to be directed towards hand-on learning so I imposed some required experiments. I incorporated CAD software and a 3D printer into the Challenge so that my students could understand the power of 3D printing. To go along with this, I had my students fill out a flowchart to document the timing and the processes performed. I also provided my students with engineering textbooks and tutorials on material tolerances.

Once I had shown the videos and given students the resources, I stepped back and acted as a sounding board. The students would ask questions and I would respond by taking their question, rewording it and asking the entire class the same rough question. Finally on the last class I had the students present their solutions to the class via PowerPoint.

Assessment:

I used concept maps, the Final Technical Report and the student presentations in order to come up with a grade.

I also assessed team participation because there were a wide variety of students in this class. My assessment process was based on how each student worked in their respected role within their group. These specific roles had been defined earlier in the school year.

Instructor Comments:

“I have a good rapport with my students so the biggest change with this Challenge was that I wasn't going to give them answers. I instead prompted them with discussion questions and ideas.”

“I think my students enjoy the PBL process but like most students they want immediate gratification—or more help from me.”

“My experience with PBL was positive—my students have been asking about building their own Challenge. The desire is there but my students are not ready yet. I am hoping to work this in by the end of the year.”

Student Comments:

“The project helped me see that STEM is an area where I would like to work.”

“Doing this project made me realize how every miniscule detail makes a difference in advanced manufacturing.”

“I usually work alone to solve problems so it was not easy for me to work in a group.”

“Prior to the project I didn’t view problem solving as an incredibly important part of advanced manufacturing. After the project however, I now see that problem solving is a critical skill and part of advanced manufacturing.”