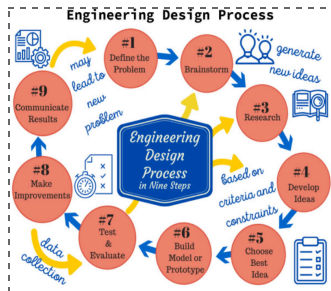


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Career Readiness Challenge

Engineering Design Process

Compare and Contrast



Towering skyscrapers constructed by architects and funky robots built by VEX robotics students may seem unrelated. However, experienced architects and robotics students have various values in common. Architecture and robotics both incorporate building, collaborating with others, and most of all, the engineering design process, which is a building that is widely used in STEM subjects.

Define the Problem

Architects carefully plan varied properties that their building requires before construction, which is similar to how robotics students define the main components of their robot. Preparation allows architects to define major necessities for their building including its sustainability, resilience, economic viability, safety, health, comfort, durability, and productive qualities. They also account for criteria and constraints including size limits and budgets. These prior steps may seem like a pain in the neck, but they can boost the well-being of an occupant. This is similar to VEX robotics students because they must define main problems such as the objective of a yearly game to start brainstorming properties for their robot. When robotics students plan, their robots will be more well-prepared for competitions. Therefore, attentive planning prepares both architects and VEX students for their next building steps.

Brainstorm

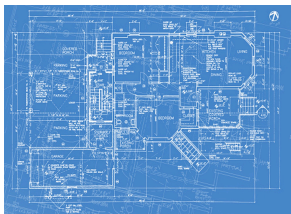
Once architects define their main objectives, they can begin to brainstorm ideas for blueprints that will help them visualize the frame and details of their construction. Architects and their employers and employees will reference their blueprints to create their buildings. Every year, VEX robotics tournament runners

release an annual game that students use as a reference for their robot, and VEX students can generate ideas for their robot based on the game's objectives. When architects and robotics students brainstorm, they both constantly reference their objectives, requirements, and limits.

Research

After brainstorming, architects can start researching materials, layouts, and properties to include in their buildings. They can also gather information about their building's environment. For example, climate change is a global crisis, and architects can use environment-friendly materials in their buildings to delay its further impacts. Robotics students also research models and strategies to create an effective robot that is realistic. In addition, they can be inspired by other teams' robots and game strategies.

Develop Ideas



Thorough research leads architects and robotics students to develop new ideas. Architects can combine their brainstorming and research to create other blueprints that are more realistic. VEX students also follow these steps by consolidating their ideas and information for their robot.

Choose Best Ideas

With practical ideas, architects and all others on their building team must choose their most fitting blueprint. Meanwhile, robotics students can create final sketches of their first robot. Both architects and robotics students must remember to include their entire team during important discussions because everybody must be accountable for major choices.

Build or Model Prototype



Prototypes allow people to generate a mental image of a structure before it is built. Most of the time, architects use paper, plastic, or cardboard to create the first model of their building. This is a crucial building step because it gives them and their building team a visual of their final design. VEX students may also build prototypes and participate in scrimmages to prepare their robots. Adjustments or additions would be included at a later time.

Test & Evaluate

Once a first draft is completed, architects and VEX students need to evaluate their progress and the effectiveness of their ideas. Architects can evaluate their material choices and sizing while robotics students can test out their robot and make changes or adjustments to it.

Make Improvements

Once all additions are added, architects can improve their final blueprint and model to begin construction. VEX students can test their robot by driving it or performing specific actions to evaluate their components. If architects or robotics students notice a problem with their creations, they can reevaluate and make improvements.

Communicate Results

Finally, architects can share their results with their entire team to ensure that the majority agree on their structure design. Robotics students can communicate with their team and teacher to confirm that their robot design is effective. In addition, communication allows ideas to be shared and thought collectively upon. By exchanging ideas, people can catch what they may have overlooked, or make improvements to various suggestions. Overall, communicating results allows both architects and robotics students to benefit from learning from each other.

Competitions

VEX Robotics tournaments play a key role in the robotics community. VEX competitions promote time management skills, collaboration with strangers, emotion control, and interviewing experience. These life skills and experiences will help a student prepare for their career because they are essential to a healthy daily life.

For starters, time management is a frequently used life skill. In this year's Full Volume VEX competition, teams are paired during scheduled matches, and additionally complete "Skills" challenges that test a team's robot and ability to code. During a tournament, ambitious teams must balance their time between matches to complete Skills challenges, which will boost their overall competition points. VEX competitions run on tight schedules, and so does daily life. Teams

develop useful life skills during robotics tournaments and will be comfortable with managing their time in the future.



In addition, robotics students will be given the chance to communicate with other teams and people. Usually, students stick with their team to build, notebook, and code, but VEX Robotics competitions open a window of opportunities for collaboration and the spread of new ideas. Teams will chat with one

another during Full Volume because they will have to work with other teams during scheduled game matches and downtime. According to my robotics teacher Kevin Kim, engineers come together "with their strengths and weaknesses, and will learn how to socialize" in small groups of five to six. Students will be immensely prepared for robotics competitions because they will get a taste of the environment of STEM working fields when they attend VEX competitions.

VEX Robotics competitions also train teams to control their emotions, which is a major player in creating a healthy mindset. Tournaments emanate tsunamis of stress, but students will gradually learn how to cope with their anxiety for the better of their team. Also, students may deal with disappointment and frustration, which are common feelings in life. According to SIGMA Assessment Systems, strong leaders have "high emotional control, they are seen as more likable, ethical, and working in the interest of the organization" and "emotional regulation has also been associated with long-term well-being" (Sharon. "Great Leaders Have Emotional Control." SIGMA Assessment Systems, 6 Oct. 2023). Robotics competitions prepare students for their future because they will learn traits that make them influential leaders. VEX students also understand how to cope with negativity that they will encounter at one point or another.

Finally, VEX Robotics competitions expose students to interviews, which is common when applying for jobs. During tournaments, teams are interrogated by judges concerning their building, teamwork, and more. In the future, students will most likely be interviewed for work, so robotics competitions train them to be calm while talking on the spot.

In conclusion, VEX Robotics competitions prepare students for their careers because they promote life skills and experiences. Students will understand how

to manage time, control their emotions, work with strangers, and ace interviews. These tournaments are beneficial to all students and will help them prepare for their future careers and lives.