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boosting soft skills

STEAM Challenges



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Creation of an Interactive Art Installation for a Contemporary Art Museum

Activity Description:

A contemporary art museum has tasked students with designing and creating an interactive installation that combines art and technology to offer the public an immersive experience. The students will explore interactive technologies to engage visitors actively, design visual and structural elements of the installation, and integrate scientific principles to optimize the use of technological and energy resources. The final work will consist of a single installation composed of multiple interconnected elements, each responding differently to audience interactions in a dynamic and engaging manner.

Project Constraints:

To meet the requirements set by the commissioning body, the project must adhere to the following constraints:

- **Students:**
20 students were selected from various institutions (high schools and technical institutes) between their junior and senior years.
- **Activity Duration:**
Two hours, two afternoons per week, throughout the entire academic year.
- **Budget:**
The project is co-funded by a regional entity and has a maximum budget of €5,000 for materials. This budget is exclusively for consumables, tools, and software and does not cover teacher fees.
- **Location:**
The project will take place within the workshop of **Museum X**, located in the city center.

Creation of a Virtual Exhibition for Biodiversity Conservation

Activity Description:

An environmental organization has tasked students with designing a virtual exhibition aimed at raising public awareness about biodiversity and the threats posed by its loss. Students will explore topics related to biodiversity and the environment, developing an interactive virtual experience that makes these subjects engaging and accessible to a wide audience. The final goal is to create an exhibition that helps the public better understand the challenges of biodiversity conservation and stimulates reflection on possible solutions.

Project Constraints:

The project must comply with the following constraints set by the commissioning organization:

- **Students:**
25 students selected from high schools (scientific and technical institutes) in their junior and senior years.
- **Activity Duration:**
Three hours, one afternoon per week, over a period of five months.
- **Budget:**
The project is funded by a non-profit environmental organization, with a maximum budget of €7,000 to be used for software, technological equipment, and digital materials.
- **Location:**
The activity will take place in the computer labs at **Center X**, located near the regional nature reserve.

Design of a Miniature Wind Farm for New Employee Integration

Activity Description:

A small company specializing in wind energy, with 50 employees, has recently hired 10 graduates from diverse disciplinary backgrounds (engineering, economics, humanities). To facilitate their integration into the team, the company has designed a STEAM activity that will allow the new hires to apply cross-disciplinary skills. During their first month at the company, the new employees will dedicate half of their workday to this project.

The participants will be tasked with designing a miniature wind farm that will serve as a display model to be showcased within the company. The model should highlight the company's sustainability, innovation, and technological leadership to observers. Special attention should be paid to the attractiveness of the final product, as it will also be used in trade shows and similar events.

Project Constraints:

- **Participants:**
10 newly hired graduates were selected as part of the company's recent large recruitment.
- **Activity Duration:**
The activity will last one month, with a half-day commitment (3 hours in the morning or afternoon), during which the participants will focus on the STEAM project.
- **Objectives:**
The aim is to enable the new employees to learn, collaborate, and apply multidisciplinary skills. The activity is designed to not only strengthen their technical abilities but also to enhance their teamwork and project management skills in complex scenarios.
- **Resources:**
The company will provide access to simulation software, design tools, and materials for building the model. A budget of €10,000 will be allocated for the purchase of technical and non-technical materials needed for the project.

Design of a Self-Sufficient Greenhouse for Public Garden Redevelopment

Activity Description:

An agricultural company, in collaboration with a municipal administration, invites students to design a self-sufficient greenhouse to be placed in a public garden as part of an urban redevelopment project. This STEAM activity will allow students to address the theme of environmental sustainability in a real-world context, promoting public education on urban agriculture and energy efficiency.

In the design phase, students must consider both technical and social aspects. It will be important to propose a solution that serves as both an educational tool and a means of raising awareness about the importance of sustainability.

At the end of the project, students will create a miniature prototype of the greenhouse and present a redevelopment plan that includes both technical and creative elements, enhancing their understanding of the real challenges related to urban agriculture and sustainability.

Project Constraints:

- **Participants:**
30 students from various institutions that are involved in the relevant topics, specifically agricultural vocational schools, language high schools, and technical institutes focused on information technology.
- **Activity Duration:**
One afternoon per week (3 hours) throughout the entire school year.
- **Budget:**
The involved agricultural company will provide the necessary materials for the project, provided that they are requested in advance before the start of the activity.
- **Location:**
The project will take place in the communal spaces of the exhibition center within the public garden in question.

Hackathon: Innovative Solutions for Recycling

Activity Description:

A waste management company recently conducted a recycling awareness campaign that unfortunately did not achieve the desired results. To address this failure and find new ideas to motivate citizens to recycle more efficiently, the company has decided to involve the creative minds of high school students.

Thus, an innovative challenge was born, and it was open to all secondary schools in the region. Students, divided into multidisciplinary teams, will be tasked with developing innovative solutions to improve recycling rates and raise awareness in the community. The goal is not only to enhance waste sorting but also to educate the public on how to reduce the environmental impact of waste.

The initiative will take place in two phases:

- **Phase 1:** In each city, groups of students will work together with selected teachers to develop proposals.
- **Phase 2:** The resulting proposals will be used in a three-day regional hackathon, where participants will compete to find innovative solutions based on the ideas generated. The best solutions will be awarded and could be implemented by the company.

Project Constraints:

- **Participants:**
Multidisciplinary teams composed of students from secondary schools.
- **Activity Duration:**
 - **Phase 1:** One month, two afternoons a week (3 hours each).
 - **Phase 2:** Three-day residential hackathon, 8 hours per day.
- **Budget:**
The company will provide resources, workspaces, and technical support for the activity. A budget of €15,000 will be allocated for each host city during the first phase. For the organization of the hackathon, a total budget of €100,000 will cover space rentals and the costs associated with the residential setup of the initiative.
- **Location:**
Workspaces provided by the company in each city for Phase 1. The final hackathon will take place in a mountain location chosen by the company.

Development of an Energy Consumption Monitoring App

Activity Description:

A technology company has tasked students from a technical high school specializing in IT to develop a mobile app that allows users to monitor and reduce their household energy consumption. This interdisciplinary project aims to push students beyond basic programming, offering them the opportunity to integrate knowledge from various fields.

The students will be responsible for programming the app and designing a user-friendly, intuitive, and visually appealing interface. They will also be in charge of integrating sensors to monitor energy consumption and analyzing the collected data to identify areas for improvement. Additionally, they will explore the relationship between household energy consumption and its environmental impacts, thereby increasing their awareness of ecological issues.

Through this STEAM activity, students will acquire cross-disciplinary skills and develop a more holistic and integrated approach to solving real-world problems.

Project Constraints:

- **Participants:**
Students from a technical high school specializing in IT were selected for their multidisciplinary skills relevant to the project.
- **Activity Duration:**
3 months, with a commitment of 3 hours per week.
- **Budget:**
The company will provide a maximum budget of €20,000 for the purchase of sensors, software, and other technical resources.
- **Location:**
The project will be developed in the school's computer labs, with the option for remote collaboration through digital platforms provided by the company.