

Stimulating the Interest of Young Learners in Physics Through Storytelling and STEM Activities

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PROJECT PHYSICS IS FUN: WHAT AND WHY?

Need: The decrease in K-12 physics enrollment is worrying despite efforts to intervene. Motivational factors, such as perceived usefulness and engagement, self-confidence, attitudes, and beliefs, are common themes in various studies exploring the issue (Ali, 2016; Bayar & Kerns, 2015; Ng & Nguyen, 2006).

Solution: To address this decline, The Project Physics is Fun (PPF) program targets 5-12-year-olds, making physics more engaging and relatable through a storytelling approach and STEM activities. PPF aims to cultivate curiosity and interest in physics while developing science process skills, aligning with Project 2061 and the Next Generation Science Standards' goal of combining "mind-on" and "hands-on" skills (Higde & Aktamış, 2022; Casey et al., 2004; Furtak & Penuel, 2019).

Program Purpose: PPF aims to make physics relevant and applicable to students' daily lives and nurture a growth mindset that empowers them to believe in their abilities. PPF provides physics outreach and engagement programs to the community, intending to decrease the decline in K-12 physics enrollment in Lafayette and its environs.



Source: Emmanuel Babalola, Dec. 3rd, 2022



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PROJECT PHYSICS IS FUN : OUR GOALS

- To pique the curiosity of young learners towards physics
- To present physics to them in a very simple, understandable and engaging approach.



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REFERENCES

For references, please type
<https://bit.ly/pfpreference> or
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METHODOLOGY

To achieve our goals, we combined both storytelling and STEM activities.

Storytelling?

- Storytelling is an effective teaching method for young learners that promotes community, literacy development, imagination, and creativity. (Casey et al., 2004)
- PPF created a story in which a curious child asked her physicist uncle about car movement, introducing three characters, Mr. Force, Mrs. Motion, and Aunty Energy, to explain physics concepts.
- The use of role-playing and characters in the story helped make learning more engaging and enjoyable for young learners.
- PPF utilized storytelling to teach basic physics concepts and engage young learners in an enjoyable learning experience.

STEM Activities?

STEM activities, including building a dream toy car, are effective in developing learners' interest in STEM careers and science process skills (Higde & Aktamış, 2022). PPF followed the storytelling activity with an opportunity for learners to apply basic principles by building their own moving toy cars, with minimal facilitator guidance or support.

• ID Framework – ADDIE

The ADDIE framework (Analyze, Design, Develop, Implement, Evaluate) was used in the project's instructional design (Dick & Carey, 2015). The project team aligned the project with the community partner organization's goals and determined the target audience's needs. The program structure was designed with flexibility and adaptability in mind, and materials were developed. The design was improved based on feedback from volunteers, our writing mentor and the community partner.

• MD Theory – Keller's ARCS

Keller's ARCS theory (Spector & Park, 2017) was incorporated throughout the design to achieve anticipated success criteria of engagement, curiosity, and interest. After evaluating several STEM kits, the project team chose one that was easy to use and Assemble. STEM activities were included to provide hands-on learning experiences and maintain learner engagement.



Source: Emmanuel Babalola, Zainab Saka, Oct. 2022



IMPACTS

Over 55 youngsters between ages 5-13, parents, and volunteers have benefited from the #PhysicsisFun initiative, with over 70 individuals reaping the rewards. Parents enthusiastically cheered on their children as they constructed and tested toy cars, resulting in a joyous atmosphere. The project had a holistic impact on the community, inspiring everyone involved.



Source: Emmanuel Babalola, Dec. 2023

Major impacts of the PPF can be found from the volunteer's reflections:

- Interest & Curiosity:** PPF sparked interest and curiosity in young learners, motivating engagement and encouraging them to learn through the process of building a moving toy car.
- Understanding the concept:** Instructional methods, such as storytelling and role-playing, helped to enhance learning and understanding of physics concepts.
- Collaboration:** The project fostered collaboration through reciprocal partnerships and support with the community partner and parents who stood by and supported their children.

CHALLENGES

- Coinciding birthday celebrations
- Short attention span observed among children under the age of five
- Uninterested children causing distractions for others

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