Hero Elementary Equity Strategies to Design and Use Blended Science Learning Resources

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Welcome and Introduction

- Today's classrooms are highly diverse, comprised of a significant percentage of students with disabilities, dual-language learners and those identified as socioeconomically disadvantaged.

- There is a need for learning resources that are engaging for a diverse group of young learners and that promote equity and accessibility.

- We will describe a case study that examines the design and use of Hero Elementary, including its blended science learning resources, created for use with diverse groups of young learners.

Introduction to Hero Elementary

Hero Elementary is a multiplatform science education initiative that aims to ignite children's natural curiosity and broaden their understanding of how the world works to empower them to make a positive difference in their communities.

With a commitment to collaborating with underserved communities, Hero Elementary emphasizes four communities:
-Latinx
-English Language Learners
-Students with disabilities
-Children from low-income households

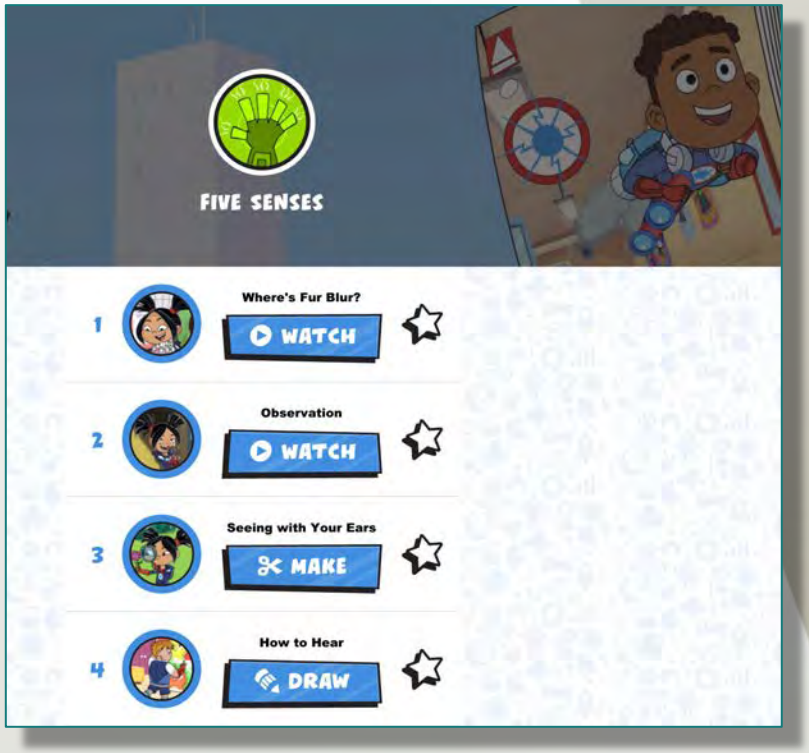
https://stemforall2021.videohall.com/presentations/2127

Hero Elementary Content

The Hero Elementary education program centers on an innovative learning platform featuring collections of educational media assets with embedded learning analytics, called "playlists."

Each playlist features:

- Animated PBS Kids television episode
- Digital or analog game
- Non-fiction e-articles
- Hands-on science activities
- Science Power Notebook
- Educator assets
- Child enrichment resources for caregivers



Please access our Digital Tote to find and use Hero Elementary learning resources

Hero Elementary and Equity

The Hero Elementary development team designed learning resources and recommendations for educators' use of the resources by integrating the Universal Design for Learning[1] approaches and newly developing:

1. The *Transformative Transmedia Framework for Early STEM Learners*[2]
2. Hero Elementary *Equity Strategies* Adapted from *NGSS For All Students*[3]

[1]Rose, 2000

[2]Ellington, Daniels, Orozco, Santiago & Arnold, 2021

[3] Lee, Miller, Januszyk, 2015

Hero Elementary's Equity Strategies

1. Connect science to children's "sense of place": the physical, historical and socio-cultural aspects of their local community.
2. Empower children to be doers of science by connecting to the cultural knowledge and experiences of their families and communities.
3. Engage children's curiosity through real-world, hands-on experiences.
4. Provide flexible learning experiences with multiple representations to engage all children.
5. Facilitate discussion and reflection about science experiences.
6. Support science learning by connecting to home and community partnerships.

The Case Study

The study explores how the *Transformative Transmedia Framework for Early STEM Learners*, and the *Equity Strategies* are reflected during *Hero Elementary* implementation at afterschool programs taking part in the study.

Descriptive Case Study

- Descriptive case studies "describe a phenomenon in its real-world context." [1]

- Research questions include:

  1. Do the design features of *Hero Elementary* support access to science learning for K–2 students, including those identified to have moderate cognitive disabilities, those who are dual-language learners, and those that are socioeconomically disadvantaged?
  2. What adaptations do educators make to *Hero Elementary*, intended to provide greater access to the content for their students? How do adaptations differ for different types of student populations, specifically those with moderate cognitive disabilities, dual-language learners, and those that are socioeconomically disadvantaged?

[1]Yin, 2003

Data Collection

- Data were collected in four highly diverse afterschool programs serving children ages 3-5 years in the southeast, south, mid-west, and west coast of the United States.

- Approximately 95% of students enrolled in these programs were socioeconomically disadvantaged. Approximately 18% had moderate learning disabilities, and 20% were dual-language learners.

- Data collection involved administrator and educator interviews (n~34), classroom observations and observations of educator professional development.

Analysis

- Qualitative analytic methods were used to analyze the data.
- A data reduction process and key findings from the coding process were documented in analytic memos.
- We used a peer debriefing process to confirm the findings.

Findings

Nearly all educators were successful in implementing Hero Elementary to support science learning for their diverse groups of learners, including those with disabilities, dual-language learners, and those who are socioeconomically disadvantaged.

> *It was **particularly great for them to have five different types of activities, each that appeared to** be helpful for different students, like those who are ELL, have IEPs, or are visual learners and kinesthetic learners, the ones that really like the hands-on activities. They can see the content in different ways, in different modalities.*

> *Today, … we were eating lunch, … and someone had poured the water out and he was like, 'Oh, you got liquid all over the table.' And I was like, 'Why didn't you just say water?' And he was like, 'We learned liquid yesterday.'*

Findings

The design features of the resources supported opportunities for students to engage in the science content more deeply.

A lot of the materials given to us early on helped us get started. It gave me, "Oh okay, okay," and then we also would look at some of the playlists and try to see how we can make it fit our kids.

My [high achieving] kids, they enjoyed the more hands-on things. And then we have my middle kids. They want to do the hands-on, but they get frustrated, and they want someone to sit down next to them and, "Hey, help me with this here." They all enjoy working in the program. But yes, there are different, like, levels to it.... It has that range and is understandable.

Findings

Educators mentioned the story narratives and diverse cast of characters supported their students' engagement in science learning.

You have a diverse group of characters that you can talk about within the lesson, and they can see, and it talks about [their world]. They can see themselves in the characters… they acknowledge it and see it.

Oh, do you see what he's doing to calm down? He's taking deep breaths. That's what we need to do if we need to calm down.

Findings

Analysis showed that educators made adaptations to *Hero Elementary*, including their use of the Equity Strategies, in response to students' individual preferences, abilities, mood, and perceived energy level.

Those kids that learn better using different learning styles…you can scaffold that easily because the lessons are pretty laid out. If you need to make it a little bit easier, there's ways to do that or to add a little bit more to it. It's ready to go, you don't have to create it. And it's integrated with the videos and the games.

Findings

Hero Elementary prompted students to think and talk about science.

We've found it very successful. They were working in groups and asking other classmates about how they were doing it and sharing different opinions. And that's very important, student interaction, to talk about a certain theme, for example.

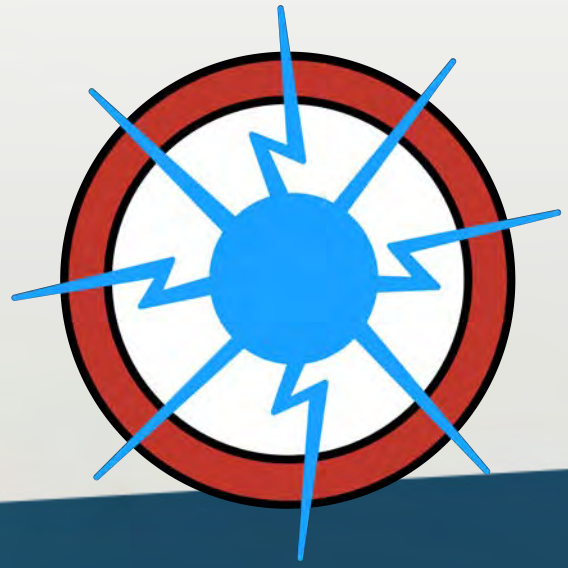
I like, for example, the [investigation] videos on the application [Hero Elementary], because they [the students] can share their opinion and what they think.

The activities encourage them to share their opinions and how to problem-solve situations.

Importance

Thoughtful design and use of blended and digital learning resources can:

- Yield big rewards for students in today's learning environments
- Provide equitable access to learning content.



Questions?

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