



Evidence in Action

A K20 Center Research Brief

“It’s Like I’m Really There”: Using VR Experiences for STEM Career Development

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Introduction

Secondary school is a critical period for developing interest in science, technology, engineering, and mathematics (STEM), as students’ interests and perceptions of future careers begin to solidify during these years. Prior research cited by the authors suggests that students are more likely to pursue STEM careers when they have sustained interest, accurate information about career pathways, and opportunities to imagine themselves in those roles. However, many students have limited exposure to STEM professionals and careers, leading to misconceptions and reduced interest.

Jiang et al. (2021) highlight that Latinx students, who remain underrepresented in STEM fields, often lack access to high-quality career exploration experiences. While researchers have examined videos and other media for STEM career exposure, little prior research has explored the use of virtual reality (VR) for STEM career development in K-12 settings. The purpose of this study was to address this gap by examining how immersive VR 360-degree videos could support secondary school students’ understanding of, interest in, and motivation toward STEM careers as part of a summer STEM enrichment program.

Methodology

Research Design

The study used a qualitative, exploratory research design. Researchers collected data through semi-structured focus group interviews to understand students’ perceptions of VR-based STEM career exploration immediately after the intervention.

Sample

Participants included:

- 39 sixth-grade students
- Students described as primarily Latinx

All participants were enrolled in a two-week STEM summer enrichment program. The program served students from a public school district near the U.S.-Mexico border in the Chula Vista region of San Diego. District demographics included a high percentage of low-income students and Hispanic students, as reported by the authors.



Intervention Descriptions

The intervention consisted of a virtual reality STEM career exploration activity embedded within a summer enrichment program's career development component.

During the intervention:

- Students viewed six STEM-related 360-degree videos curated from YouTube.
- Videos featured female STEM professionals and professionals from racial minority groups, including engineers, astronauts, researchers, and green energy entrepreneurs.
- Students explored realistic workplace environments (e.g., a NASA workspace, a Google data center, laboratories, and space missions).
- Students participated in the activity in groups of approximately 10.

Delivery and roles:

- The intervention was facilitated as part of a structured program run by the research and program staff.
- Students alternated between two viewing formats:
 - Google Cardboard headsets paired with iPhones (considered the full VR experience)
 - iPads displaying the same videos without head-mounted immersion

Dosage

Each student experienced approximately:

- 15 minutes viewing videos with Google Cardboard
- 15 minutes viewing videos on an iPad

Total VR-related activity 5 times per student: approximately 30 minutes

Data Analysis

Researchers analyzed the focus group interview transcripts using grounded theory and inductive thematic analysis. Two researchers independently coded the data, refined categories through discussion, and established reliability using Cohen's kappa. The analysis focused on identifying themes related to perceived affordances, learning outcomes, and challenges of the VR experience.

Results

Findings suggest that the VR experience supported STEM career development in several ways:

- **Increased career knowledge:** Students reported learning concrete details about STEM careers, including daily tasks, work environments, and responsibilities.



- **Enhanced visualization and realism:** Students frequently described the VR videos as “realistic” and said they felt like they were “really there,” which helped them better understand careers compared to reading or watching traditional videos.
- **Support for possible selves:** Some students reported that seeing STEM professionals helped them imagine themselves in similar careers and consider new career options.
- **Motivation and interest:** Several students described increased excitement and motivation to pursue STEM-related careers after the VR experience.

However, the study also identified challenges:

- **Physical discomfort:** Some students experienced dizziness or nausea, which interfered with learning.
- **Content relevance:** A few students indicated that the careers shown were not aligned with their interests.
- **Self-efficacy concerns:** For some students, highly realistic portrayals made careers seem too difficult, reducing confidence rather than increasing it.

These findings suggest that VR can enhance career exploration when thoughtfully implemented but requires careful attention to content selection, student readiness, and physical comfort.

Application into Practice

This intervention can be used by schools and districts as a supplemental STEM career exploration activity, particularly within secondary school programs or enrichment settings.

To implement a similar approach, schools should consider the following actions:

1. Select high-quality VR or 360-degree career videos that reflect students' backgrounds and interests.
2. Integrate VR exploration into existing career development or STEM enrichment activities, rather than using it as a stand-alone experience.
3. Plan for short, time-limited sessions (approximately 30 minutes total per student) to reduce fatigue and physical discomfort.
4. Provide alternative viewing options (such as tablets or traditional screens) for students who experience nausea or cannot use headsets.
5. Offer scaffolding or guided discussion before or after viewing to help students process what they saw and connect it to their own goals.
6. Consider students' current self-efficacy and developmental level when choosing content to avoid overwhelming them with advanced or highly complex careers.



Work Cited

Jiang, Y., Popov, V., Li, Y., Myers, P. L., Dalrymple, O., & Spencer, J. A. (2021). "It's like I'm really there": Using VR experiences for STEM career development. *Journal of Science Education and Technology*, 30, 877-888. <https://doi.org/10.1007/s10956-021-09926-z>