

## Research Brief

### *Exploding Pipelines: Mythological Metaphors Structuring Diversity-oriented Engineering Education Research Agendas*

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## Background

Critics have established that there are major methodological flaws with using pipeline as a metaphor for structuring research studies to investigate the underrepresentation of certain groups; yet pipeline remains the predominant metaphor in engineering education research on underrepresentation. We find it important to remind the engineering education community of the theoretical and methodological limitations of reliance on one metaphor to guide research studies.

## Purpose

This paper critically explores the discourse of “pipeline”, aiming to (re)introduce to engineering education researchers both the method of discourse analysis as well as alternative metaphorical frameworks. We use the academic stories of STEM faculty and help us explore: 1) what theoretical or methodological advantages and disadvantages does the pipeline metaphor afford researchers?, and 2) how does the metaphor highlight or mask the lived experiences of women working in academic STEM contexts?

## Methods

We use empirical data collected for ADVANCE Purdue’s Academic Career Pathways study using oral history and participatory research methods to explore the consequences of the pipeline metaphor’s predominance. Participants were 14 faculty members in science, technology, engineering and agricultural fields, including both men and women. They were asked a series of questions specifically focused on their thoughts about the pipeline metaphor and what alternative metaphors would describe their own career paths.

## Results

Many participants agreed that the pipeline “sounds reasonable.” However, that was often because of alignment with a defined career path either in their experience or in the experiences of those they knew, not because it was particularly helpful at highlighting important aspects of careers. On the other hand, many participants said the metaphor was *not* a good fit, and they articulated specific limitations of the pipeline. When asked to suggest better metaphors to describe their careers, participants gave a wide range of new metaphors. They did not invoke already existing popular metaphors such as *glass ceiling*, *labyrinth*, *lattice*, or *escalator*.

## Conclusions

We conclude that an *ecosystem* of metaphors would help us understand the complexity of women’s career paths in STEM academia and move engineering education research beyond the linear model of the pipeline metaphor.

### Implications for Practice

- Administrators should also use an ecosystem of metaphors when mentoring and providing advice to faculty; for example, rather than relying on a metaphor of work-family “balance”, they should find other ways of discussing challenges that recognize the dynamic nature of whole lives. Balance can imply static and constant balance, which is not realistic.
- Hiring committees should be trained not to view adherence to the pipeline as the normal career path with stints outside of the pipeline viewed negatively. Normalizing the pipeline trajectory through preference for candidates who stayed in the pipeline could unintentionally build that career pathway into policy.

## Citation

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## Link

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