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## ABSTRACT

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# Evidence or Excitement: Which Predicts Implementation of Research-based Pedagogy by CS Educators?

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## ABSTRACT

There is a lack of clarity on how to increase the adoption of research-based pedagogy in CS education. Past research indicates that evidence from education studies was not an influential factor, while educator excitement was a significant one. Based on an educator survey, we found that peer-reviewed citations correlated with educator familiarity and intended adoption. Interestingly, perceived benefits and challenges, which we used as a proxy for excitement, had a statistically significant yet smaller effect size. These results suggest that despite previous findings, evidence from education research might influence adoption. This work also offers a quantitative metric for educator excitement.

## CCS CONCEPTS

- Social and professional topics → Professional topics
- Computing education → Computing education programs
- Computer science education

## KEYWORDS

Research-based Pedagogy; Adoption of Pedagogy; Professional Development; Dissemination of Research

## 1 BACKGROUND

Adoption of evidence-based teaching practices remains low among CS educators [1]. "Despite being researchers themselves, the CS faculty we spoke to ... did not believe that results from educational studies were credible reasons to try out teaching practices" [2]. Additionally, an educator's belief that a new approach would increase learning outcomes was found not to predict the adoption of a practice [3]. Instead, CS educators' decision to adopt was found to be most significantly driven by educator excitement, "which was also clued in both the perceived adoption concerns and reported adoption reasons" [3].

## 2 OVERVIEW

US-based computer science and engineering school lecturers and professors were surveyed about their familiarity with, use of, and perceived benefits of and challenges to implementing

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various evidence-based teaching approaches and tools. Additionally, a systematic literature review was conducted on the ACM digital library. Citations for each pedagogical method were searched for in the SIGCSE, ICER, and ITiSCE proceedings dated between 2010 to 2020.

In this study, we use the citation counts as a proxy for evidence and ask does the amount of evidence predict teacher familiarity with and adoption of evidence-based practices? We also attempt to reproduce the predictive power of excitement, which was previously measured qualitatively, by quantifying excitement as perceived benefit minus perceived challenges for an evidence-based practice.

## 3 CONTRIBUTIONS AND FUTURE WORK

Our results show a correlation ( $p<0.05$ ) between the number of citations and CS educators' familiarity with pedagogical practices (explaining 67%). Additionally, we found a correlation ( $p<0.05$ ) between the number of citations and CS educators' intent to adopt evidence-based practices (explaining 61%). However, no statistically significant correlation was found between citations and actual implementation, despite a correlation ( $p<0.05$ ) between familiarity and implementation. These findings suggest a role in availability of evidence in the adoption process, contradicting previous self-reported data.

We found that educator excitement (defined as perceived benefit minus perceived challenges) is correlated ( $p<0.05$ ) with adoption—explaining 37% of adoption and 41% of planned adoption. When investigating if combining perceived challenges and benefits were necessary, we found that individually these components had half the explanatory power. Perceived benefits only correlated with intent to implement while perceived challenges only correlated with actual adoption. Our findings replicate previous work while offering scalable, quantitative methods for gauging educator excitement.

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