

Funding the Gap

What Drives Project Approval on DonorsChoose?

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Abstract

This project presents an interactive data-storytelling analysis of the DonorsChoose dataset to examine which project characteristics are associated with approval outcomes. Using Plotly-based visualizations, the analysis combines a correlation-driven overview with detailed trend and interaction analyses across project cost, project scale, subject category, grade level and teacher experience. The results reveal systematic differences in approval rates across grade levels and subject areas, and show that higher project cost consistently reduces approval probability, while teacher experience improves outcomes only under specific conditions. Overall, the study provides an interpretable, evidence-based view of structural patterns in project approval that can support more informed and equitable decision-making on the platform.

Introduction

DonorsChoose enables teachers across the United States to request funding for classroom projects, ranging from basic supplies to specialized learning tools. While a large majority of projects are approved, this headline success rate can hide important inequalities in which types of projects ultimately receive support.

For many classrooms, unsuccessful funding requests translate directly into delayed or missing learning resources. Understanding whether certain project characteristics systematically reduce the likelihood of approval is therefore important for improving fairness and access across the platform.

This project, titled “Funding the Gap”, addresses the following decision-oriented question: which types of projects are more likely to face rejection, and what observable characteristics are associated with this disadvantage? The analysis focuses on project cost, project scale, teacher experience, grade level and subject category, with the aim of identifying structural patterns that can inform better platform design and targeted support for disadvantaged projects.

Framing the Question

Decision question: Which project characteristics are most strongly associated with approval on DonorsChoose, and which types of projects are systematically disadvantaged?

Audience: DonorsChoose product, program and policy teams who design submission guidance and funding campaigns.

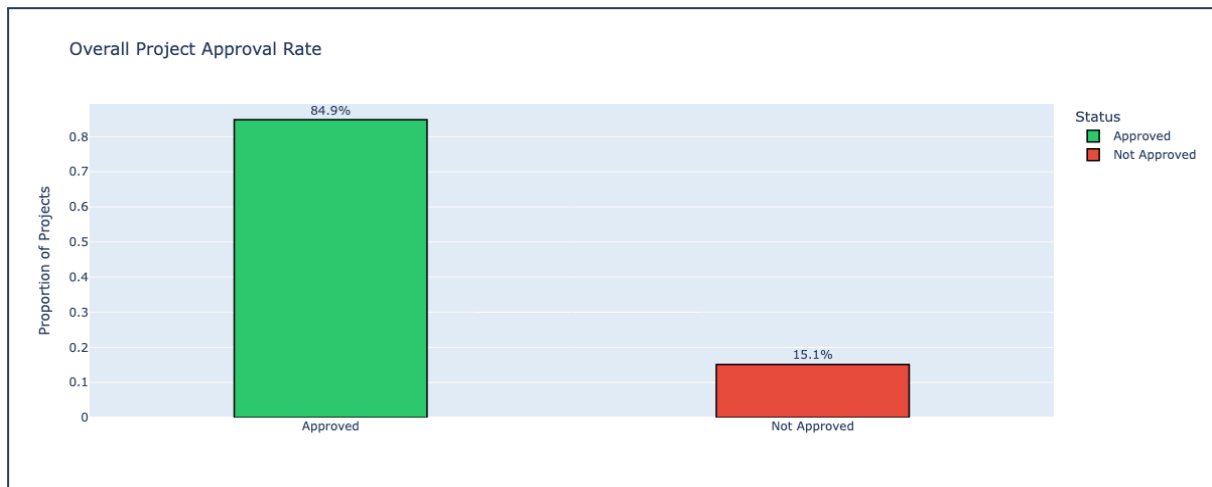
Purpose and success: The analysis is successful if it identifies structural patterns behind approval outcomes and translates them into actionable recommendations to improve fairness and platform support.

Business Questions

To understand what drives project approval on DonorsChoose, the analysis focuses on the following questions:

- Which project characteristics show the strongest association with approval outcomes?
- Does higher project cost and larger requested quantity jointly reduce the likelihood of approval?
- To what extent does teacher experience improve approval outcomes, and under what conditions?
- Are certain subject categories systematically advantaged or disadvantaged in the approval process?

Overall Approval Landscape



KEY INSIGHT

Approximately 85% of projects on DonorsChoose are approved, indicating broad platform accessibility.

- Nearly **one in seven projects** still fails to receive funding.
- A single average can hide systematic differences across project types.
- Approval outcomes reflect multiple interacting project characteristics.

KEY INSIGHT

This baseline motivates the following correlation-based overview.

What Drives Approval? - A Correlation Overview

Correlation Heatmap



KEY INSIGHT

This heatmap provides a high-level overview of how key numeric project characteristics are linearly associated with project approval. It serves as a diagnostic starting point for the analysis rather than a final explanation.

Key signals from the correlation overview -

- Values close to **+1** indicate a positive association with approval, values close to **-1** indicate a negative association, and values close to **0** indicate little or no linear relationship.
- **Teacher experience** exhibits the strongest positive association with approval, indicating that projects submitted by more experienced teachers are slightly more likely to be approved.
- **Project price** shows the strongest negative association with approval, suggesting that higher-cost projects face a greater risk of rejection.
- **Requested quantity** also displays a weak negative relationship with approval, implying that larger project scope may contribute to lower approval probabilities.
- The digit count in the project summary shows a near-zero association, indicating that simple textual length or numeric content alone does not meaningfully influence approval outcomes.

KEY INSIGHT

Importantly, all correlations are small in magnitude. This indicates that approval decisions are not driven by any single numeric factor. Instead, these results highlight where the most relevant signals lie and motivate a deeper examination of how cost, experience and project scale behave across different ranges and contexts.

KEY INSIGHT

The following sections therefore build directly on this overview by first examining the strongest negative signal—project cost—and then investigating the strongest positive signal—teacher experience—before exploring how these factors interact.

From Correlation to Trend: Does Project Cost Influence Approval?



KEY INSIGHT

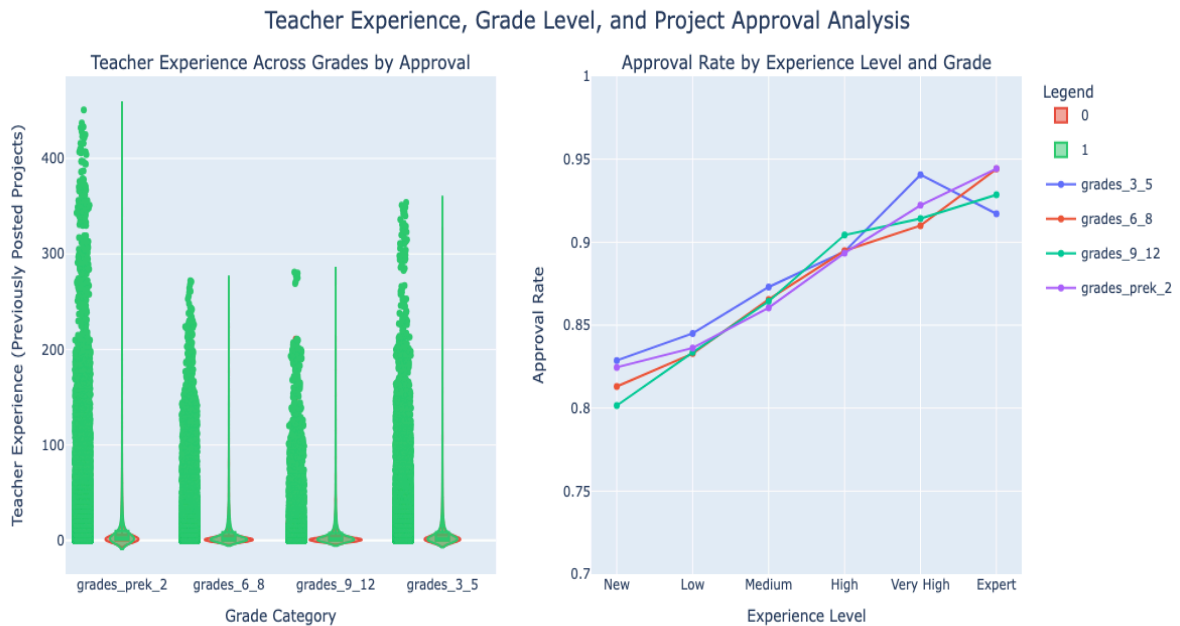
The correlation overview identified project price as the strongest negatively associated numeric feature. This plot examines how approval rates change across cost levels.

- The left panel shows the distribution of project costs for approved and rejected proposals.
- The right panel shows approval rates across increasing price ranges.
- Approval rates decrease steadily as project cost increases (from above 90% in the lowest range to around 75–80% in the highest range).

KEY INSIGHT

The following sections therefore build directly on this overview by first examining the strongest negative signal—project cost—and then investigating the strongest positive signal—teacher experience – before exploring how these factors interact.

From Correlation to Trend: The Role of Teacher Experience -



KEY INSIGHT

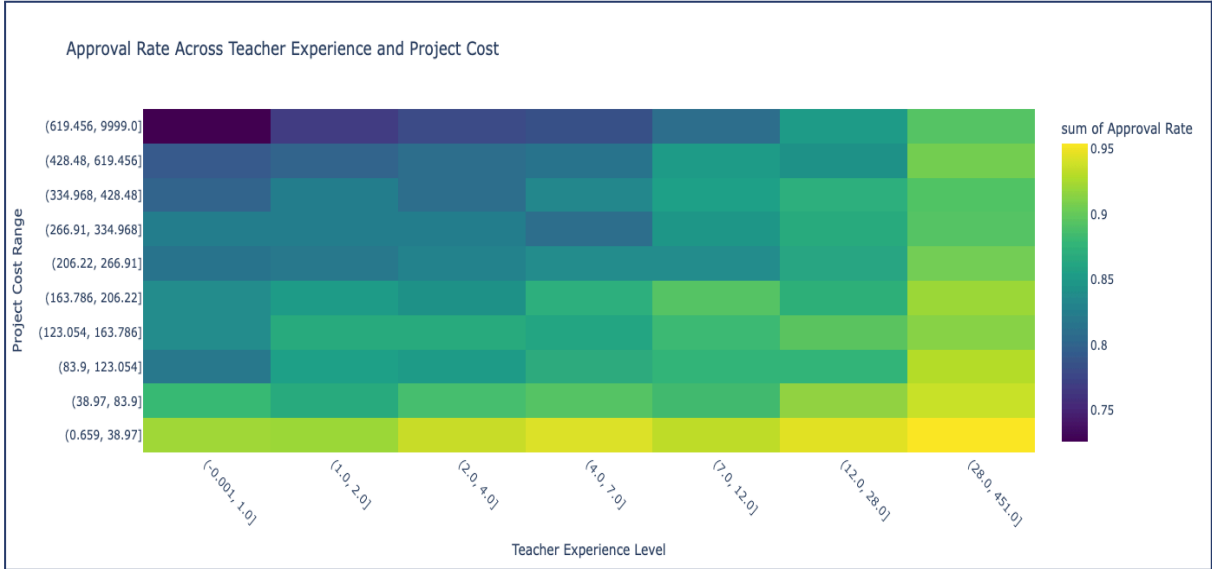
The correlation overview showed teacher experience as the strongest positively associated numeric feature. This visualization examines how approval rates change across experience levels.

- The x-axis represents teacher experience, measured by the number of previously posted projects.
- Approval rates increase with experience, with the largest improvement occurring from first-time teachers to moderately experienced teachers.
- More experienced teachers consistently achieve approval rates above the platform average.

KEY INSIGHT

Teacher experience improves approval likelihood, but it does not fully offset the disadvantages associated with high project cost. The next section examines how cost and experience interact.

Cost and Experience: An Interaction Effect



KEY INSIGHT

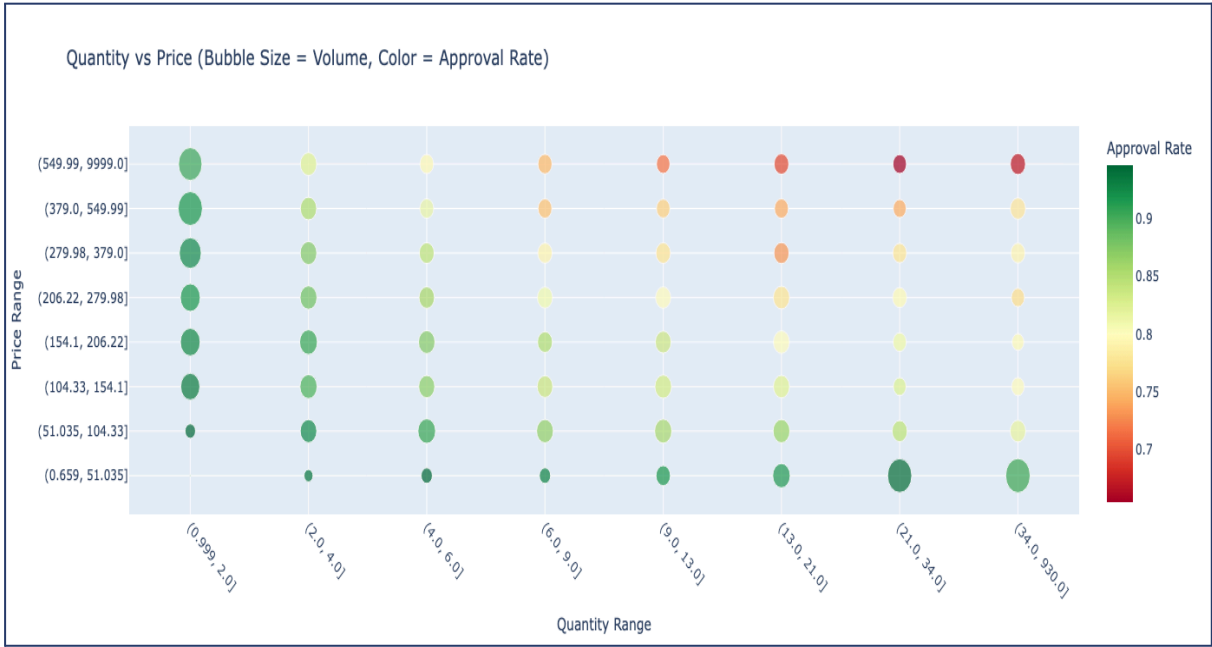
The previous sections showed that project cost is negatively associated with approval and that teacher experience is positively associated. This heatmap examines how both factors operate jointly.

- The horizontal axis shows teacher experience (from new to highly experienced teachers).
- The vertical axis shows increasing project cost ranges.
- Approval rates are high for low-cost projects across nearly all experience levels.
- Approval rates drop sharply for high-cost projects, even for highly experienced teachers.

KEY INSIGHT

Teacher experience improves approval likelihood primarily for low- and mid-cost projects. At high cost levels, project price becomes the dominant constraint.

Project Scale: Quantity and Price Combined



KEY INSIGHT

The correlation overview indicated a weak negative association between requested quantity and approval. This visualization examines how quantity behaves when combined with project cost.

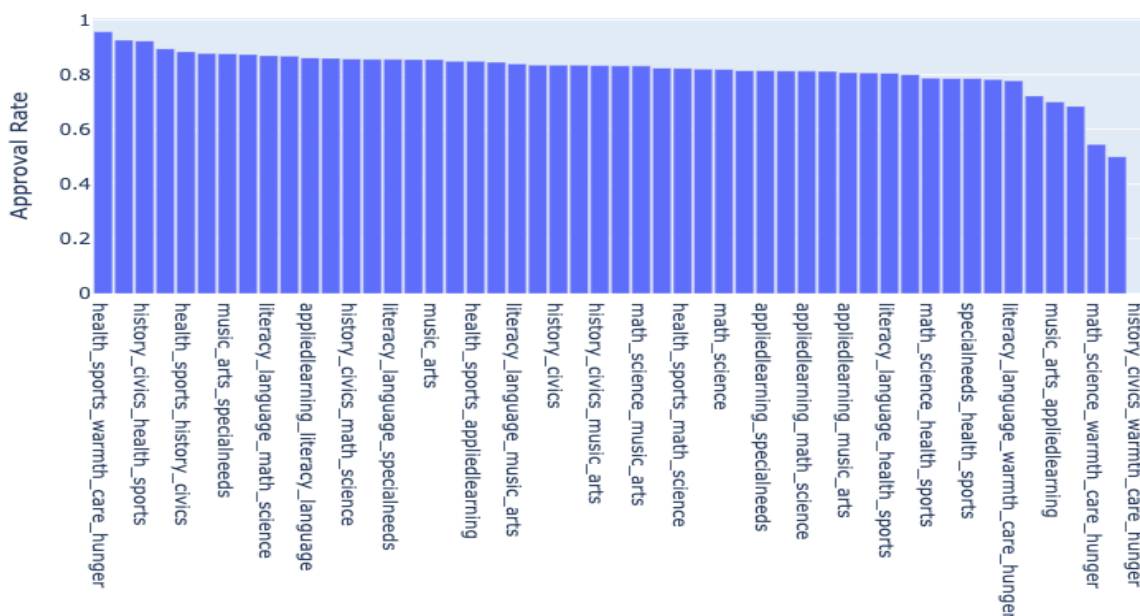
- The x-axis shows requested quantity and the y-axis shows total project cost.
- Each bubble represents a group of projects; bubble size reflects how many projects fall in that group.
- Approval rates are highest for low-quantity, low-cost projects and lowest for projects that are both high in quantity and high in cost.

KEY INSIGHT

Project scale becomes most restrictive when quantity and cost increase together, indicating that overall project burden—rather than price or quantity alone—drives lower approval probabilities..

Differences Across Subject Categories -

Approval Rate Subject Categories



KEY INSIGHT

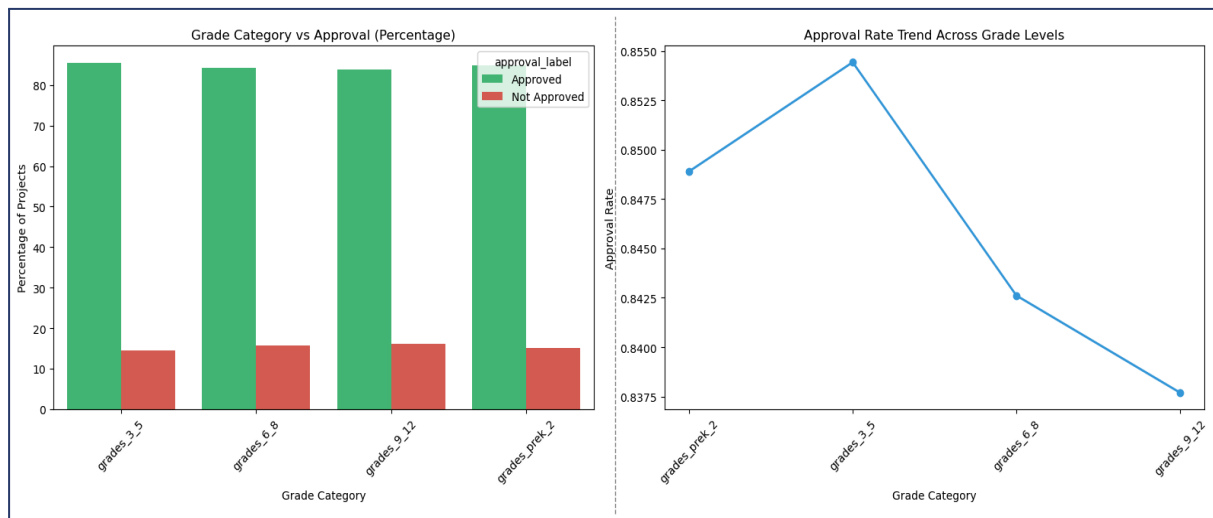
The correlation overview focused on numeric project characteristics. This section extends the analysis to subject categories, which may also shape approval outcomes.

- Each bar shows the approval rate for a subject category.
- Some subjects consistently achieve approval rates above the platform average, while others fall noticeably below it.
- Core academic and classroom-oriented subjects tend to perform better than several enrichment or specialized subject areas.

KEY INSIGHT

These patterns indicate that approval outcomes are influenced not only by project cost and scale, but also by donor preferences and perceived instructional priority across subject areas.

Approval Patterns Across Grade Levels



KEY INSIGHT

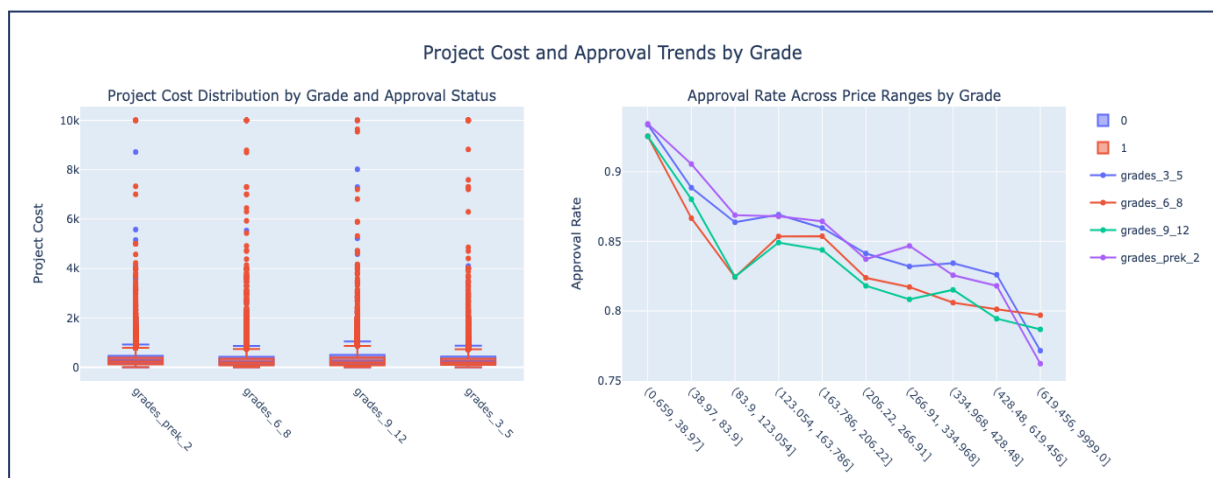
After examining cost, experience, scale and subject differences, this section extends the analysis to student grade levels.

- Each bar shows the approval rate for a grade category.
- Projects targeting early and elementary grades achieve the highest approval rates.
- Approval rates decline for middle school and high school projects.

KEY INSIGHT

These results indicate that projects serving older students face a systematic disadvantage that cannot be explained by numeric project characteristics alone.

How Cost Impacts Approval Across Grade Levels



KEY INSIGHT

Approval rates decline as project cost increases for all grade levels. However, the strength of this decline varies substantially by student age group, with projects for older grades experiencing sharper reductions in approval as costs rise.

How to read this plot (with examples):

- The x-axis represents increasing project cost ranges, while each line corresponds to a different grade category.

- At lower cost levels, approval rates are relatively high across all grades, indicating broad support for affordable projects regardless of student age.
- As project cost increases, approval rates decline for every grade group, but the decline is steepest for middle school and high school projects.
- For example, a high-cost project for elementary students still maintains a moderate likelihood of approval, whereas a similarly priced project for high school students falls much closer to the bottom of the chart.

Overall, experience acts as a partial equalizer. It improves outcomes for all teachers, but structural factors—such as higher costs and donor preferences— continue to limit approval rates for projects serving older students.

KEY INSIGHT

This evidence indicates that projects serving older students are subject to a compounded disadvantage: they typically require higher budgets and face stricter approval thresholds as costs grow. Cost therefore amplifies existing grade-related differences in funding success.

Reasons for Project Rejection (Observed Patterns)

- High project cost: Projects with larger requested budgets consistently show lower approval rates across all analyses, making cost the most common risk factor for rejection.
- Large project scope: Projects that combine high quantity with high total cost experience the lowest approval probabilities, indicating that overall project burden increases rejection risk.
- Limited teacher experience: First-time and low-experience teachers face higher rejection rates, particularly when projects are moderately or highly priced.
- Grade-level disadvantage: Projects serving middle school and high school students are more likely to be rejected than those targeting early and elementary grades.
- Subject-specific disadvantage: Certain subject categories consistently show lower approval rates, suggesting that some instructional areas receive weaker funding support.

Recommendations

- Provide structured onboarding and proposal guidance for new teachers, as approval rates are consistently lower for low-experience submissions.
- Introduce cost-aware guidance at submission time, such as suggested budget ranges based on similar successful projects.
- Create a dedicated review or campaign pathway for high-cost projects, which face low approval probabilities regardless of teacher experience.
- Increase visibility and targeted campaigns for underperforming subject areas and projects serving older grade levels.
- Monitor approval performance using interaction-based indicators (for example, high cost × high school × low experience)

Why This Matters

Classroom resources directly affect what teachers can offer their students. When certain types of projects repeatedly struggle to receive funding, the result is reduced learning opportunities for specific student groups.

This analysis shows that approval outcomes are driven primarily by structural project characteristics such as cost, scale, grade level and subject category, rather than individual teacher effort alone. Addressing these structural barriers can improve equity in access to classroom resources while

Conclusion

- This project analyzes DonorsChoose classroom funding requests to identify which project characteristics are associated with approval outcomes. Although most projects are approved, meaningful and persistent disparities exist.
- A correlation-based overview shows that no single numeric feature strongly explains approval. Project cost is the strongest negative signal, while teacher experience is the strongest positive signal. However, interaction analyses reveal that experience cannot fully offset the disadvantages associated with high project cost or large project scale.
- Projects serving older students and certain subject categories also face systematically lower approval rates, indicating structural rather than individual-level barriers.
- The findings suggest that DonorsChoose can improve equity and platform effectiveness by providing targeted onboarding support, cost-aware guidance, and dedicated pathways for high-cost and under-served projects.

References

- Singh, B., et al. *Donor Retention in Online Crowdfunding Communities: A Case Study of DonorsChoose.org*. arXiv preprint, 2015. <https://arxiv.org/abs/1503.02729>
- Mollick, E. *The Dynamics of Crowdfunding: An Exploratory Study*. Journal of Business Venturing, 2014. <https://doi.org/10.1016/j.jbusvent.2013.06.005>
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