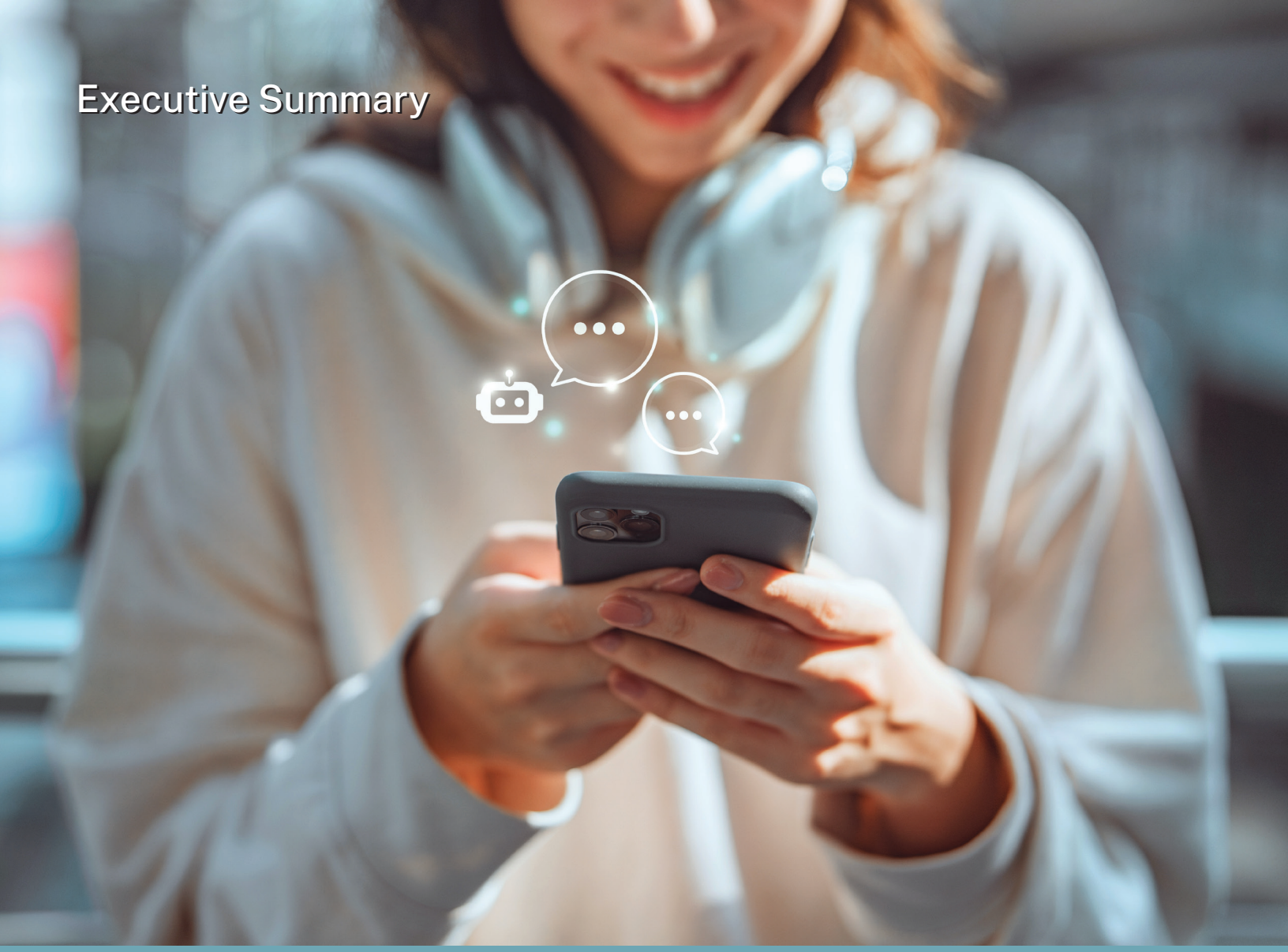
Executive Summary



IMPROVING A CHATBOT TO INCREASE FINANCIAL AID APPLICATIONS

Findings from the Optimizing Texting Technology through Engagement Research with Students (OTTERS) Project

Erika Lundquist
Brit Henderson
Sophia Sutcliffe
Laura Cojocaru
Kasey Eickmeyer
Annabel Utz
Sufiyan Syed
Audrey Yu

MARCH 2025

mdrc
BUILDING KNOWLEDGE TO IMPROVE SOCIAL POLICY

EXECUTIVE SUMMARY

Improving a Chatbot to Increase Financial Aid Applications

Findings from the Optimizing Texting Technology through Engagement Research with Students (OTTERS) Project

Erika Lundquist, Brit Henderson, Sophia Sutcliffe, Laura Cojocaru, Kasey Eickmeyer, Annabel Utz, Sufiyan Syed, and Audrey Yu

MARCH 2025

mdrc
BUILDING KNOWLEDGE TO IMPROVE SOCIAL POLICY

FUNDERS

This research was supported by the Capital One Foundation.

The following organizations support dissemination of MDRC publications and our efforts to communicate with policymakers, practitioners, and others: Arnold Ventures, Ascendium Education Group, Yield Giving/MacKenzie Scott, and earnings from the MDRC Endowment. Contributors to the MDRC Endowment include Alcoa Foundation, The Ambrose Monell Foundation, Anheuser-Busch Foundation, Bristol-Myers Squibb Foundation, Charles Stewart Mott Foundation, Ford Foundation, The George Gund Foundation, The Grable Foundation, The Lizabeth and Frank Newman Charitable Foundation, The New York Times Company Foundation, Jan Nicholson, Paul H. O'Neill Charitable Foundation, John S. Reed, Sandler Foundation, and The Stupski Family Fund, as well as other individual contributors.

The findings and conclusions in this report do not necessarily represent the official positions or policies of the funders.

For information about MDRC and copies of our publications, see our website: www.mdrc.org.

OVERVIEW

Since 2019, high school seniors from low-income households in the state of Washington have received guidance from OtterBot, an interactive chatbot texting tool with artificial intelligence (AI) capabilities. The chatbot, designed by the Washington Student Achievement Council (WSAC), provides information to simplify the complex processes involved in applying for financial aid and enrolling in postsecondary education or training. It is specifically intended to support students in the state's College Bound program, which offers early financial aid commitments to students in low-income households, helping make higher education more accessible.

In 2022, the Optimizing Texting Technology through Engagement Research with Students (OTTERS) project—funded by the Capital One Foundation and led by MDRC and WSAC in partnership with Mainstay—was launched to study how the chatbot could be improved to better support students and families. This report provides information about and findings from the first two phases of this ongoing study.

In the study's first phase, the research team identified students' needs and opportunities for OtterBot to better meet those needs by creating process maps, conducting focus groups, administering surveys, and analyzing administrative data. This phase revealed several significant challenges faced by students from low-income backgrounds—particularly those who are the first in their families to pursue higher education. Many students experienced confusion over the financial aid process, uncertainty about college costs, and a lack of awareness and knowledge about financial aid options such as those available through the College Bound program. To compound these difficulties, OtterBot's reach remained limited; only 43 percent of College Bound students received its messages, with just 12 percent responding and 15 percent opting out. This low level of engagement can likely be partially attributed to students' distrust of automated tools such as OtterBot. The research also uncovered differences in engagement, financial aid application completion, and postsecondary enrollment, with gaps evident across GPA, race/ethnicity, and gender.

In the study's second phase, the research team applied these findings to enhance OtterBot's messaging approach to better support student engagement and understanding of financial aid application processes. The alternative messaging approach aimed to use communications best practices to provide clearer information and guidance and to better address behavioral barriers and student concerns about automated tools. Using A/B testing to compare the alternative and standard messaging approaches, the research team found that the alternative messages increased student engagement with OtterBot. There was also a statistically significant increase in financial aid application completion rates for male students. (A statistically significant effect is one that can be attributed with a high degree of confidence to the intervention being studied.)

As a potential next step, Phase 3 of the OTTERS project could pilot and evaluate an intervention that combines the alternative approach to messaging from Phase 2 with a new, more intensive strategy for providing enrollment and financial aid guidance. This strategy could involve using OtterBot to connect students and parents to more in-depth or localized services, or using generative AI to provide more customized messaging.

The OTTERS project has demonstrated the value of using a phased approach, consisting of user research followed by optimization and testing, to improve educational technology platforms. This approach involves studying the intended user, the platform, and possible modifications to the platform to improve the tools and services before devoting time and resources to evaluating the effects of the platform in an impact study. This strategy could prove valuable in analyzing future educational technology initiatives.

ACKNOWLEDGMENTS

This report would not have been possible without the contributions of many people. First, we would like to thank all of the students and parents who participated in surveys and focus groups; without their insights, this project would have been infinitely less rich. Thank you to the numerous College Bound Champions—educators and advocates—across Washington State who supported our efforts to include student and family feedback in this project. These supporters were fundamental in ensuring the voices of those OtterBot serves were included in the work. We would like to express our sincerest appreciation to the Washington Student Achievement Council (WSAC) for its close partnership in all aspects of this project. This project would not have been possible without the dedication, partnership, and substantial time from WSAC's leadership and staff. We would also like to thank Mainstay, who worked closely with WSAC to implement changes in OtterBot messaging, provide data, and brainstorm, and who were always enthusiastic to contribute in any way that they possibly could.

We would like to thank the full OTTERS team who informed and supported the development of this report. Particular thanks are due to Richard Hendra and Caitlin Anzelone for providing guidance on all aspects of the project, and to Ian Watson, David Selby, Bennett Otten, and Annamarie Warnke for analyzing data and creating tables and figures for the report. Thanks to Seth Muzzy for his expert advice on the Phase 1 survey, and to Praveena Javvadi for her thoughtful development of Phase 1 activities and materials to center the student experience. Thanks to Richard Hendra, Joshua Malbin, Sarah Weiss, Melissa Beard, Rebecca Unterman, and Caitlin Anzelone for their careful review and feedback on the report. Thanks also go to Amy Perry for editing the report and to Carolyn Thomas for preparing the report for publication. Finally, many thanks to Jenn Walters-Michalec, our grant officer, and the Capital One Foundation for funding this project and publication.

The Authors

EXECUTIVE SUMMARY

Washington State provides guaranteed financial aid for postsecondary education or training for all students who meet eligibility criteria, yet the use of this aid remains low. Many students, especially those from low-income backgrounds, struggle with navigating the complex financial aid application processes and understanding available resources.[1] In 2019, to support students in overcoming these challenges, the Washington Student Achievement Council (WSAC) launched OtterBot, an interactive, artificial-intelligence (AI) enabled chatbot.

OtterBot provides students and their parents and guardians with real-time, always accessible guidance about the financial aid and postsecondary enrollment processes. The chatbot provides tips, answers students' questions, and sends reminders about important deadlines. Communication via text message is meant to help demystify financial aid and increase aid take-up by offering timely and relevant support, while also allowing services to be provided at a large scale. While anyone can sign up to receive OtterBot messages, the chatbot is specifically geared toward students in the College Bound program, a financial aid program in Washington State that provides early commitment of financial aid to eligible students from households with low incomes, in order to make furthering their education more financially attainable.[2]

In 2022, the Optimizing Texting Technology through Engagement Research with Students (OTTERS) project, funded by the Capital One Foundation and led by MDRC and WSAC in collaboration with Mainstay, was launched to study how the chatbot could be improved to better support students and families. Thus far, the project has included the following phases:

- **Phase 1: User Research** involved conducting research on individuals in the target population for OtterBot — using a human-centered design approach, including process mapping, focus groups, administrative data analysis, and a survey — to identify opportunities to improve the chatbot.

- **Phase 2: Redesign and Testing** included the redesign of the OtterBot messaging strategy using some of the insights gleaned from the Phase 1 research activities. The changes were primarily focused on textual modifications in keeping with this project's phased approach and the aim to try out lower-cost, easy-to-implement interventions before moving on to larger-scale changes. A/B testing was employed to assess the extent to which this rede-

1. U.S. Department of Education, *First-Generation College Students: Demographic Characteristics and Postsecondary Enrollment* (National Center for Education Statistics, 2021).

2. For eligible College Bound students, College Bound funds can be used to cover tuition for four-year colleges, community or technical colleges, and apprenticeship programs. Families earning low incomes were identified by the students' eligibility for free and reduced-price meals in middle school. Low-income College Bound students make up 98 percent of the total OtterBot user population. Individuals can also message the chatbot directly to opt into messages.

signed messaging strategy led to differences in key outcomes including engagement with OtterBot and financial aid application completion. Phase 2 occurred during the 2023-2024 school year, a year characterized by a delayed and issue-laden rollout of the revamped FAFSA application process.[3]

A potential third phase of the project would pilot and evaluate the effects of using OtterBot to connect individuals to additional, more intensive services suggested by the Phase 1 user research.

The phased approach used in this project — carrying out user research, followed by optimization and testing — can be used in many different settings where there is an interest in optimizing chatbots or other educational technology interventions to improve educational outcomes.

OTTERS PHASE 1: SUMMARY OF FINDINGS

Findings from Phase 1 fell into four categories based on the research goal they addressed. The findings are summarized below.

Research Goal 1

Explore student needs and perceived barriers to applying for financial aid and enrolling in postsecondary education and training

Low-income and first-generation students face many challenges in pursuing higher education, as confirmed by Phase 1. These include uncertainty about costs, confusion over financial aid applications, and lack of knowledge about what various scholarships in Washington State cover. While financial concerns are the biggest issue, other factors such as wanting to stay close to home or uncertainty about how to apply also play a role. Some students may question the value of education, while the effort needed to apply and potential for future debt may feel more certain and daunting. The FAFSA process is notoriously time-consuming and prone to errors, adding mental and time costs. Additionally, postsecondary programs can feel competitive and exclusive, especially for students lacking support networks.

Research Goal 2

Explore student receipt of and engagement with OtterBot messages, levels of financial aid application completion and postsecondary enrollment, and associations among these outcomes

OtterBot messages can only be helpful to students who both receive and read them. One way to assess whether students read the messages is through measuring active engagement

3. Liam Knox, "The Long-Awaited FAFSA Autopsy Is Here," Inside Higher Ed (website: https://www.insidehighered.com/news/government/student-aid-policy/2024/09/24/gao-releases-initial-findings-fafsa-investigation, 2024)

(responding to messages). While OtterBot is designed to help students from families with low incomes, it is not reaching all eligible students; only about 43 percent of College Bound students in the high school graduating classes of 2020 and 2021 were successfully sent an OtterBot message.[4] Among all College Bound students in those cohorts, including those who may not have received OtterBot messages, about 12 percent responded to at least one message during their senior year. Fifteen percent opted out of receiving OtterBot messages at some point during their senior year. Meanwhile, 39 percent completed a financial aid application and 41 percent enrolled in postsecondary education within a year of graduating from high school.

The analysis found differences based on student characteristics. OtterBot was more likely to reach and engage students with higher GPAs who were already more likely to attend postsecondary education or training. Over 79 percent of survey respondents reported that OtterBot messages helped them take at least one of the following actions: complete a financial aid application; apply to a college, training program, or apprenticeship; reach out to a counselor, teacher, or other school staff member; visit a college, training program, or apprenticeship; and/or research a different school or training program. These results do not support the conclusion that OtterBot caused these actions to happen, but they do suggest the survey respondents found the OtterBot messages helpful.

Research Goal 3
Identify differences between subgroups, based on student characteristics

There were large gender differences in financial aid application completion and college enrollment, with males substantially less likely to submit financial aid applications and enroll in education or training after high school. The study also revealed a range of outcomes across different racial and ethnic groups. Importantly, while Hispanic students had rates of financial aid application completion and postsecondary enrollment toward the middle of the distribution, this group makes up almost half of the College Bound student population and could be an important group to focus on for making OtterBot more culturally and linguistically accessible.

Research Goal 4
Assess student reactions to OtterBot messages and opportunities for improving OtterBot

There are several different pathways to making OtterBot more effective in helping students access financial aid and postsecondary education or training. One approach is to provide better, clearer, and more compelling information on financial aid and postsecondary education and training options — for example, by using strategies to overcome behavioral barriers. However, this information is only going to be helpful to students to the extent that they

4. In 2024, legislation was passed that may make it easier for WSAC to access updated contact information, which may increase the reach of OtterBot moving forward.

receive, read and pay attention to messages. Therefore, a second way to potentially make OtterBot messages more effective is to increase the number of students who are reached by and who engage with OtterBot messages. Continuing to invest in efforts to maintain accurate contact information is crucial to improving the reach of OtterBot. Based on the user experience research, key strategies for improving engagement include the following: making sure content of OtterBot messages is helpful to students; developing strategies — including ways to build trust and recognition — to address students' negative perceptions of chatbots and automated messaging; improving awareness of language customization options; adopting the approach that text messaging is not a one-size-fits-all strategy and that for certain advice and activities, students prefer other forms of interaction; providing information about the financial aid process to younger students and parents or guardians; and engaging college counselors to help.

Phase 1 of the OTTERS project resulted in a rich set of findings, highlighting the benefits of conducting formative research before undertaking an impact study. One set of findings highlighted issues the team worked to address in Phase 2 of the OTTERS project, which focused on making strategic revisions to OtterBot's messaging approach.

OTTERS PHASE 2: SUMMARY OF FINDINGS

In the second phase of the OTTERS project, the research team made revisions to OtterBot's existing messaging approach. The team designed and implemented an A/B test to examine the effects of this revised, "alternative" approach compared with the "standard approach." A/B testing is a statistical method, similar to a randomized controlled trial, in which participants in a program are randomly assigned to one of two groups ("Group A" or "Group B") who receive different versions of a program. Group A, the "standard messaging group," consisted of College Bound seniors in the 2023-2024 class who were sent messages that closely mirrored the messages WSAC sent to seniors in the previous year. (The messages included some select modifications from WSAC, MDRC, and Mainstay such as improving the translation practices for Spanish-speaking recipients and changing content to reflect the new FAFSA.) Group B, or the "alternative messaging group," consisted of the remaining seniors, who received a novel set of messages. These messages were designed to address Phase 1 findings on student informational needs and perceived barriers to postsecondary education or training, challenges in OtterBot reach and engagement, and student reactions to and recommendations for improving OtterBot. The goals of the alternative messaging approach were to increase student engagement with OtterBot, to more effectively provide information and guidance to help students navigate FAFSA and postsecondary education applications, and to address other behavioral barriers related to enrollment in postsecondary education or training that were identified in Phase 1.

The analysis found that the alternative messaging approach increased student engagement with OtterBot. Additionally, while the alternative approach did not increase financial aid application completion for female students or nonbinary students, it led to a statistically significant increase in financial aid application completion rates among male students. Among

College Bound male students, 49 percent of those who received the alternative messages completed a financial aid application compared with only 46 percent of those who received the standard messages. Based on these data, it can be estimated that if all male students in the study had received the alternative messages, an additional 141 students would have successfully completed financial aid applications, a milestone with the potential to change the trajectories of their lives. It is important to note that the data collection period overlapped with the rollout of the revamped 2024-2025 FAFSA application process, with which users experienced a number of technical problems. So, these results may not reflect what would have happened in a more typical school year.

Analysis of the effects by subgroup found that the alternative messaging strategy increased response rates across all subgroups. The alternative messaging strategy also led to reductions in opt-outs among students with GPAs below 2.0 and among students in rural areas, suggesting that the alternative messages were better able to keep these students engaged.

It should also be noted that Phase 2 tested one version of OtterBot messaging against another version of OtterBot messaging; therefore, the results show the effect of the change in messaging rather than the overall effectiveness of OtterBot.

CONCLUSION

While the changes made to OtterBot's messaging approach had positive effects on engagement and financial aid application completion for male students, changes in messaging language alone cannot fully address some of the critical issues highlighted in Phase 1. However, with more substantive changes to OtterBot, the chatbot could be a crucial tool in connecting students and parents or guardians to more intensive services that can support them in financial aid application and postsecondary enrollment. A possible Phase 3 pilot study could focus on improvements such as using a highly engaging OtterBot to connect students to regional and local supports and information, more fully integrating OtterBot with guidance counselor activities, connecting students to services meant to support basic needs, connecting students to peer mentors, or using generative AI to provide more customized and tailored educational support.

A number of states, organizations, and schools are using chatbots to increase access to postsecondary education and training and even for other educational purposes. The process, tools, and methodologies from this project are applicable in many different settings where there is an interest in optimizing these types of interventions. An upcoming toolkit will present several tools from the project that could be adapted and reused by others. Additionally, the OTTERS project has demonstrated the use of a phased approach, consisting of user research followed by optimization and testing, to research educational technology platforms. This approach involves studying the intended user, the platform, and possible modifications to the platform to improve the tools and services before devoting time and resources to evaluating the effects of the platform in an impact study. This strategy could prove valuable in analyzing future educational technology initiatives.

ABOUT MDRC

MDRC, a nonprofit, nonpartisan social and education policy research organization, is committed to finding solutions to some of the most difficult problems facing the nation. We aim to reduce poverty and bolster economic mobility; improve early child development, public education, and pathways from high school to college completion and careers; and reduce inequities in the criminal justice system. Our partners include public agencies and school systems, nonprofit and community-based organizations, private philanthropies, and others who are creating opportunity for individuals, families, and communities.

Founded in 1974, MDRC builds and applies evidence about changes in policy and practice that can improve the well-being of people who are economically disadvantaged. In service of this goal, we work alongside our programmatic partners and the people they serve to identify and design more effective and equitable approaches. We work with them to strengthen the impact of those approaches. And we work with them to evaluate policies or practices using the highest research standards. Our staff members have an unusual combination of research and organizational experience, with expertise in the latest qualitative and quantitative research methods, data science, behavioral science, culturally responsive practices, and collaborative design and program improvement processes. To disseminate what we learn, we actively engage with policymakers, practitioners, public and private funders, and others to apply the best evidence available to the decisions they are making.

MDRC works in almost every state and all the nation's largest cities, with offices in New York City; Oakland, California; and Washington, DC.