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## The North Carolina Teaching Fellows Program: A Case Study of the Use of Forgivable Loans in Recruiting Future STEM Teachers

By Katie N. Smith

*In 2018-2019, North Carolina implemented a loan forgiveness program to recruit talented postsecondary students into teaching majors in needed subject areas. This qualitative case study analyzes the influence of the North Carolina Teaching Fellows Program (NCTFP) on 10 student participants' college, major, and career plans in STEM education to understand how loan incentives shaped student interest in teaching careers in STEM subjects. Findings reveal that forgivable loan funding influenced college choice among those choosing institutions at the time of NCTFP acceptance. While the NCTFP was most appealing to participants who already planned to become STEM educators, there is also evidence that the program shaped some participants' academic and career goals towards STEM education. While the NCTFP also serves to promote graduates' entry into low-performing schools, this incentive may generate unintended consequences for students and schools alike.*

**Keywords:** *Case Study, Loan Forgiveness, Teacher Recruitment, College Choice, Career Development*

The teaching profession is experiencing significant workforce shortages in the U.S., especially in high-demand subjects such as science, technology, engineering, and mathematics (STEM; Cross, 2016). While these shortages are not new, they have been exacerbated in recent years due to declining enrollment in postsecondary teacher preparation programs, teacher retirement and turnover, post-recession hiring, reduced student-teacher ratios, and increased STEM requirements for K-12 students (Gray & Taie, 2015; Ingersoll & Perda, 2010; Marder et al., 2017). In response to teacher shortages, policymakers are increasingly introducing financial incentives to promote teacher recruitment (Kolbe & Strunk, 2012).

While financial incentives vary, limited duration incentives, or finite rewards over a fixed period of time, are popular for promoting teacher recruitment at the state level (Kolbe & Strunk, 2012). One such incentive is loan forgiveness, where postsecondary student loans are partially or fully forgiven for teachers working in eligible positions. Loan forgiveness programs may take a variety of forms, although they are most prevalent in regions, schools, and/or subject areas experiencing significant teacher shortages (Kolbe & Strunk, 2012). Under some loan forgiveness programs, teachers with student loans become eligible for post hoc forgiveness upon entry into the profession, or once they have taught for a designated number of years (examples include the Mississippi Teacher Loan Repayment Program, West Virginia's Underwood-Smith Teacher Scholarship Loan Assistance Program, and the federal Teacher Loan Forgiveness program). In other programs, loan money is given to college students pursuing teaching credentials in exchange for students' commitment to post-graduate teacher service (examples include Illinois' Grow Your Own Teachers, South Carolina Teaching Fellows, Virginia Teaching Scholarship Loan Program, the federal TEACH Grant program, and the North Carolina Teaching Fellows Program). In these programs, loans are forgiven once teaching service requirements are met. If conditions are not met, participants must pay back the loans with interest.

Despite the investment of federal and state governments into loan forgiveness programs designed to recruit new teachers, there is a dearth of research on these programs. The limited work that exists employs quantitative methodology that provides insight into aggregate effects (e.g., Liou & Lawrenz, 2010; Peyton & Kramer, 2017) but is unable to explain the nuanced ways in which individual program participants navigate these policies and adjust their college and career plans accordingly. To begin to address this gap, this study focuses on the experiences of students in the North Carolina Teaching Fellows Program (NCTFP), a state-level program implemented in 2018-2019 that provides forgivable loans to postsecondary students pursuing

teaching credentials in North Carolina's most needed subjects: STEM education and special education. For a brief summary of NCTFP policy conditions, see Appendix.

The provision of forgivable loans in exchange for post-graduate teaching service is a policy structure requiring long-term career commitments from college students, yet research suggests that students frequently change majors and career ideas throughout the course of college and beyond (Astorne-Figari & Speer, 2019). Further, even among those who enter teaching, early career attrition is high, with 17% of teachers leaving the profession within the first four years (Gray & Taie, 2015). Therefore, the purpose of this study is to understand how the newly-implemented NCTFP shaped 10 participants' institutional choices, academic program choices, and short- and long-term career plans related to teaching. Due to potential differential motivations for subject area preferences among teachers (Mamlin & Diliberto, 2015) and the unique economic opportunity associated with bachelor's degrees in STEM (Carnevale et al., 2015), this study focuses exclusively on NCTFP participants pursuing secondary STEM education.

## Review Of Literature

Although teacher shortages in STEM subjects are not new (Cross, 2016), recent political attention and a changing economy that features significant job growth in STEM industries have led to an increased demand for qualified teachers in these subjects over the last decade (Fayer et al., 2017). The competitive STEM labor market has been identified as one reason behind the shortage of science and math teachers, as college graduates in STEM typically earn higher salaries in industry than in teaching (Carnevale et al., 2015; Ingersoll & May, 2012). In teaching, pay structures are set by state and school systems instead of market conditions, suppressing financial return based on field-specific merit and skill (Podgursky & Springer, 2011; Walsh, 2014). Thus, teachers in STEM subjects typically earn the same salaries as their colleagues in content areas that have less competitive external labor markets.

Relatively low financial return, especially in the context of escalating college costs, may be one reason that the teaching profession is facing shortages, especially in STEM. College costs have grown exponentially in recent decades (McFarland et al., 2018) and approximately 70% of bachelor's graduates in teaching careers have student loans (Staklis & Henke, 2013). Nationally representative data from 2012 found that bachelor's graduates who entered teaching had student loans at a median of \$20,000 while making a median annual salary of \$33,100 (Staklis & Henke, 2013). While it is difficult to determine the causal implications of student loan debt, some researchers have found that a larger debt burden may deter students from choosing majors and careers in lower-paying fields, including teaching (Baker, 2019; Minicozzi, 2005; Rothstein & Rouse, 2011). These findings are consistent with college enrollment trends; across the U.S., the number of bachelor's degrees conferred in education declined 19% between 2005 and 2015 (National Center for Education Statistics, 2017).

Evidence suggests that loan forgiveness and other financial incentives related to alleviating college costs may serve as useful recruiting tools for STEM students interested in teaching (Marder et al., 2017). Two studies on federal-level loan forgiveness programs, the TEACH Grant and the Robert Noyce Teacher Scholarship Program, found that the respective programs were unsuccessful in newly recruiting students into education majors and careers, but were effective in compelling students who were already pursuing education to take jobs in targeted high-needs subjects and schools (Liou & Lawrenz, 2010; Peyton & Kramer, 2017).

In general, research suggests that financial aid policies that frontload benefits and reduce upfront costs are most attractive to consumers (Castleman et al., 2015; DellaVigna, 2009; Field, 2009; Gandhi, 2008). For instance, grants and other sources of financial aid for the first year critically influence students' college selection (Hurwitz, 2012). In addition, loan subsidies are more likely to influence enrollment and career decisions when provided upfront rather than when they are forgiven post hoc, even when the net financial benefit is the same (Field, 2009; Gandhi, 2008). Although upfront models may be attractive to consumers, programs that frontload benefits and delay costs may have adverse effects as well. Outcomes from the federal TEACH Grant program, for instance, have been dismal at best. Conservative estimates report that at

least 63% of college students who enrolled in the TEACH Grant program did not meet post-graduate teaching service commitments or administrative requirements, and the funds they received during college were therefore converted into loans owed with interest (Barkowski et al., 2018). For 42% of TEACH Grant recipients, if the money received during college had been initially categorized as a loan (as it later became for most participants), recipients' loan totals would have exceeded federal borrowing limits (Barkowski et al., 2018). Exceeding limits can have detrimental long-term effects on borrowers' ability to pay back loans (Chapman & Dardon, 2017; Consumer Financial Protection Bureau, 2017; Government Accountability Office, 2015).

## **North Carolina Policy Context**

Reflecting national trends, North Carolina is one of 40 states experiencing teacher shortages in STEM (Cross, 2016). The University of North Carolina (UNC) system of public four-year universities is the state's largest producer of public school teachers (Bastian & Xing, 2016) and has seen a 41% decrease in undergraduate enrollment in teacher preparation programs since 2010 (Public Schools First NC, 2018). North Carolina has also perennially ranked in the bottom quarter of states for teacher pay over the last decade (National Education Association, 2018), sparking rallies among teachers in recent years (Hui, 2019).

Importantly, teacher shortages are not equally distributed. The availability of qualified teachers, especially in high-demand subjects, is skewed significantly by economic resources. High-poverty schools experience the greatest difficulty recruiting and retaining qualified teachers, both nationally (Aragon, 2016; Borman & Dowling, 2008; Feng & Sass, 2018; Simon & Johnson, 2015; Struyven & Vanthournout, 2014; Sutcher et al., 2016), and in North Carolina (BEST NC, 2018; Clotfelter et al., 2011). Within North Carolina, teacher salaries vary widely, with the largest public school systems in the most populous areas offering substantial supplements in addition to the state's base salary (a high of \$8,435 in the Wake County School System), while many of the small systems offer no supplement at all (North Carolina Association of County Commissioners [NCACC], 2017). As a result, smaller, lower resourced, and more rural schools offer lower salaries and may be less economically and socially attractive destinations, especially for new college graduates entering teaching careers in high-demand subjects.

Difficulty recruiting and retaining teacher talent can have important consequences for schools and students. In general, schools serving high proportions of low-income and/or racially minoritized students also tend to be lower-performing, a byproduct of limited resources that adversely affect teacher salaries, instructional spending, and administrative support (Simon & Johnson, 2015). These challenges create a cycle of inequity; lower-resourced schools have difficulty attracting and retaining well-trained teachers, with negative implications for educational quality and student performance (Clotfelter et al., 2010).

## ***North Carolina Teaching Fellows Program***

The North Carolina Teaching Fellows Program serves as a policy response to state needs. Although the program was newly implemented in 2018-2019, the NCTFP has a storied history. From 1987 to 2011, a program of the same name and of similar structure operated to promote talented postsecondary students' entry into the teaching profession (Public School Forum of North Carolina [PSFNC], 1986). The original NCTFP had over 10,700 participants throughout its tenure (Cohen, 2015) and is often cited as a model teacher recruitment program across related literature (e.g., Carver-Thomas & Darling-Hammond, 2017; Clewell & Forcier, 2001; Hirsch et al., 2001; Kelly & Northrop, 2015; Podolsky & Kini, 2016). The re-introduced NCTFP is far smaller in scope and size, with only 74 Teaching Fellows across five institutions in its inaugural year.

Unlike the current program, student participants in the original NCTFP could pursue any subject area and could opt to teach at any public school in the state to receive loan forgiveness. However, an evaluation found that most Fellows in the original program ended up choosing teaching positions in high-income and high-performing schools (Henry et al., 2012). In response, the new NCTFP was designed to recruit teachers for subjects with the greatest teacher shortages, STEM and special education. Additionally, the new program incentivizes Fellows' entry into low-performing schools.

Participants in the new NCTFP may enter the program as incoming or current undergraduate or graduate students, so long as they were not already enrolled in a postsecondary program in education. Participants in the new NCTFP receive up to \$8,250 for each year they participate. For each year of funding, participants commit to teaching for either one year at a low-performing school (as defined by the state) or for two years at a school not considered low-performing. Thus, Fellows who join as incoming bachelor's students and who receive loans for four years will owe the state either four years of teaching at a low-performing school or eight years of teaching at a school not considered low-performing. Fellows who do not complete teaching requirements must pay back money received with 8% interest. Notably, this interest rate is higher than rates for undergraduate federal loan programs (5.05% for direct federal loans disbursed between July 1, 2018 and July 1, 2019; Federal Student Aid, n.d.).

The original NCTFP sought to target and promote the entry of men, racially minoritized students, and students from rural counties into teaching (Cohen, 2015; PSFNC, 1986), although an evaluation found no evidence that these goals were achieved (Henry et al., 2012). The new NCTFP did not retain the original program's goals related to teacher diversity, and all five institutions that were selected as partners for the new program are predominantly White institutions located centrally within the state. Teachers in North Carolina are 73% White (BEST NC, 2018) while over half of the state's K-12 students identify as part of racially minoritized groups (North Carolina Department of Public Instruction, 2015). Given this context, the absence of minority-serving institutions (MSIs) as NCTFP partners, particularly historically Black colleges and universities (HBCUs), has resulted in great criticism (Hui, 2017; Stancill, 2017). Additionally, because low-income, racially minoritized, and rural students often attend institutions close to home and/or may be more likely to stay in these communities long-term (Hillman, 2016; Means et al., 2016), the absence of partner institutions in geographic areas that struggle to recruit new teachers was also cited as a missed opportunity (Ford & Lindsay, 2017). While state leaders have hinted at program expansion (Fofaria, 2019; Joint Legislative Education Oversight Committee, 2018), no institutions have been added as of Fall 2020.

The NCTFP has also changed ownership between iterations. The original NCTFP was administered by the Public School Forum nonprofit organization and the new NCTFP is operated by the statewide UNC System Office. Although I was unable to get access to data on the outcomes of the original Teaching Fellows, two separate reports suggested that at least 30% of Fellows in the original NCTFP did not meet service requirements to receive full loan relief (Cohen, 2015; North Carolina Office of the State Auditor, 2003). By not meeting all program requirements, these participants owed the state the funding they received as students, with interest (Cohen, 2015). A media report about the lack of teacher diversity within North Carolina featured men of color who participated in the original NCTFP and reported a multitude of reasons why the men did not receive full loan forgiveness, including receiving unanticipated professional opportunities that were not eligible for forgiveness, difficulty finding eligible employment, and administrative or bureaucratic challenges (Hinchcliffe, 2019).

Overall, research on loan forgiveness programs is scarce. Research tends to show that financial incentives are effective in enhancing teacher recruitment, although success is contingent on geographic area, school, teacher characteristics, and the nature and size of the incentive (Clotfelter et al., 2011; Cowan & Goldhaber, 2018; Feng & Sass, 2018; Gilpin, 2012; Leigh, 2012; Rickman et al., 2017). However, there is limited support for the effectiveness of loan forgiveness incentives in recruiting prospective teachers into the profession, and no research on how these programs may influence college choice. This case study begins to address this gap.

## Conceptual Framework

Because this study centers student participants' decision making processes in relation to the NCTFP, I rely on concepts from rational choice theory and behavioral economics to guide this work. In rational choice theory, decision makers consider multiple options via a cost-benefit analysis, making choices that optimize benefits relative to costs and that result in self-interested decisions within an individual's own context and social structures (Gilboa, 2010). However, behavioral economics theorists point out that rational choice processes are psychologically and behaviorally unrealistic, as deviations from the rational choice model are "too widespread to be ignored, too systemic to be dismissed as random error" (Tversky & Kahneman, 1986, p. 3).

Decisions may be particularly difficult (and irrational) when choices are complex, when people have limited experience, and when costs and benefits are incurred across different time frames (Scott-Clayton, 2015). This is a likely scenario for traditional age postsecondary students given the number of complex choices that traditional age postsecondary students make (e.g., selecting a college, a major, and more), students' relative lack of experience in postsecondary and professional domains, and future outcomes that are difficult to predict (Dynarski & Scott-Clayton, 2006; Scott-Clayton, 2015).

While some scholars use behavioral economics to discount rational choice theory, behavioral economics concepts can also be used alongside rational choice to identify challenges on a case-by-case basis (Weimer, 2017). I adopt this approach as a conceptual framework in the present study. In choosing to participate in the NCTFP, many program participants are simultaneously making college, major, and career decisions. As it is impossible to know whether student participants are making objectively rational decisions, I focus on the costs and benefits that students identify within their decision making processes. Additionally, I pay close attention to limitations revealed in participants' cost-benefit analyses, whether limitations are explicitly identified by participants or evidenced by inconsistencies in participants' stated interests and behaviors.

Research on students navigating complex financial aid systems suggests that rational decisions may be bounded by a limited availability or understanding of policy information, or as a result of preferences and needs changing over time (Camerer & Loewenstein, 2004; Castleman et al., 2015; Dynarski & Scott-Clayton, 2006; Scott-Clayton, 2015). Optimal decisions cannot be made when critical information is missing or when options are not fully understood by the consumer. Yet even when acknowledging their limited understanding of options, people do not necessarily seek out the information they know they are missing. Instead, people often rely on anecdotal, idiosyncratic, or the most accessible information to make decisions (Beggs et al., 2008; Castleman et al., 2015; Scott-Clayton, 2015).

Behavioral economics also introduces time-inconsistent preferences, the idea that individual preferences change over time (Castleman et al., 2015; DellaVigna, 2009). Often, present-day tasks are perceived more burdensome than future tasks, leading to discrepancies between short-term actions and long-term goals (Castleman et al., 2015). In the case of postsecondary financial aid policies, program structures can influence student participation and choice, even when different structures provide the same net benefits (Camerer & Loewenstein, 2004; Tversky & Kahneman, 1981). In general, policies that provide easily accessible benefits while reducing upfront costs are more attractive to consumers (Beggs et al., 2008; Castleman et al., 2015; Dynarski & Scott-Clayton, 2006; Field, 2009; Gandhi, 2008). In the NCTFP, participants begin receiving the primary program benefit (loans) immediately, while program costs (required service) remain distal. For students who receive NCTFP loans throughout the entirety of a bachelor's program (four years) and who select eligible teaching jobs in schools that are not considered low-performing (thus, owing eight years of service), there is a 12 year gap between program entry and completion, a substantial period of time separating initial benefits and distal costs.

This temporal mismatch of costs and benefits, complex program conditions, and program participants' relative inexperience with both postsecondary systems and teaching careers all create conditions that may make it difficult for prospective participants to make rational and informed decisions. Thus, I focus on understanding the costs and benefits that participants identify in deciding to participate in the NCTFP. Concepts from behavioral economics, especially information accessibility and time-inconsistent preferences, additionally situate limitations in participants' cost-benefit analyses within the context of the program structure.

## Methods

Case study is a qualitative methodological approach defined by its in-depth investigation of a contemporary phenomenon within a specific context, the use of theoretical propositions that inform data collection and analysis, and a reliance on multiple sources of evidence (Yin, 2014). The present case study is bounded both spatially and temporally, using multiple sources of data including student interviews, surveys, timelines, and staff interviews to understand the experiences and decisions of 10 NCTFP student participants. Student participants serve as the unit of analysis in this study; all participants are enrolled at partner institutions and are pursuing teaching credentials in secondary STEM education in the inaugural 2018-2019 year of the new NCTFP.

## Research Sites

In 2018-2019, the NCTFP had five public and private institutional partners: Elon University, Meredith College, NC State University, UNC Chapel Hill, and UNC Charlotte, all of which were also partners in the original program. The institutional partners were selected in November 2017 via a competitive process based on a series of metrics about their teacher preparation programs (NCTFP, 2017). After institutions were selected as program partners, each institution identified at least one faculty or staff member to manage the NCTFP program on their campus.

Student applications for the NCTFP were due just one month after partner institutions were announced, leaving limited time for recruitment in the program's first year. Fellows applied to the program in December 2017 and participated in in-person interviews in Spring 2018 to be selected into the program. Successful Fellows were required to separately gain admission into (or already attend) a partner institution of their choice. Although the new program had a capacity for approximately 130 Fellows, only 110 students were officially selected for the inaugural year (out of 232 applicants) and 74 chose to participate (Barkley, 2018; UNC System, 2019). The number of Fellows varied by campus, ranging from seven at Meredith College to 25 at NC State. One statewide professional development activity was scheduled for all program participants in the inaugural year, and campus coordinators were additionally responsible for developing and sponsoring professional development for their own Fellows. Campus coordinators reported organizing a wide range of activities, including regular cohort meetings, guest speakers, school visits, shared readings, and encouraging study abroad and research experiences, with some coordinators also requiring Fellows to write reflection essays or blog posts.

## Data Collection

To negotiate entry into the field, I first built relationships with program stakeholders at all five partner institutions. To establish case contexts, build rapport, and obtain access to student participants, I first conducted interviews with NCTFP coordinators at each of the partner institutions, as well as with the statewide program coordinator at the UNC System Office. These six interviews lasted 30-60 minutes each and took place either in-person or over the phone in Fall 2018. Interviews were semi-structured and were not recorded, although I took extensive notes. Coordinator interviews enabled a robust understanding of the NCTFP as a whole, as well as campus-specific implementation strategies.

While coordinator interviews were critical to informing case context and corroborating student data sources, the data of primary importance to this study came from NCTFP student participants. Each campus coordinator agreed to email information about the study to STEM NCTFP students on their respective campuses. Eligible STEM education programs included high school or middle school mathematics, earth science, physical science, biology, physics, chemistry, agriculture, or technology. Interested students completed an electronic interest survey to confirm eligibility and share background information (institution, class year, major/teacher licensure area, gender, race) and to indicate their level of certainty about their plans to complete NCTFP service requirements and their interest in teaching in a low-performing school.

In attempt to recruit participants from all campuses, two coordinators sent the study recruitment email out a second time after no students from their respective campuses responded to the initial request. Ultimately, 11 eligible students completed the interest survey, although one student did not respond to an interview request. Ten participants (Table 1) scheduled and completed interviews, and at least one student from each campus participated. As case study research is conducted to gain a deep understanding of a phenomenon that is strictly bounded (Yin, 2014), this sample size allowed for an in-depth exploration of participants' decision-making processes relative to the NCTFP. Ten participants represented 19% of the full population based on study criteria, as there were 53 total STEM participants in the 2018-2019 NCTFP (UNC System, 2019).

After participants submitted interest surveys, I conducted 90 minute in-person interviews with each student participant at or nearby their respective campus libraries in Spring 2019. At the start of the interviews, I asked participants to create a timeline representing key events in their career development, especially events that led to their interest in STEM education. This activity was designed to promote recall, to give participants ownership over their experiences without the priming effects of interview questions, and to serve as a tool for data triangulation (Kolar et al., 2015). Once complete, I asked participants to describe their timeline. Case study interviews should resemble guided conversations following the researcher's line of inquiry (Yin, 2014). As such, discussion about timeline events evolved into the semi-structured protocol regarding participants' experiences and interests related to careers, college and major choices, learning about and deciding to apply to the NCTFP (and the influence of money on this decision), and current professional goals. I emailed activity instructions and the interview protocol to participants one week before their interviews to encourage advance reflection. At the end of the interview, participants completed a brief paper survey to collect further background information including age, educational history (e.g., K-12 school location and school type), parental education, and parental income. Participants also selected pseudonyms to represent themselves within the research. Participant interviews were audio recorded and professionally transcribed.

Following each interview, I wrote a detailed chronological summary of each participant's academic and career decisions and experiences. I then gave each participant access to a secure, private electronic drive with copies of their study documents and the written summary. In preparation for second interviews, I asked participants to review their interview transcript and the drafted summary. I also created a unique protocol for each participant to address missing information or discrepancies that I noticed during initial analysis. Second interviews occurred approximately one month after each participant's initial interview, were 45 minutes long, and took place in-person, virtually, or over the phone depending on participant availability. Second interviews served as a mechanism for increasing data integrity and to provide time and space for participant feedback on their own data and on emerging themes. I audio recorded and personally transcribed second interviews. Participants received a \$25 Amazon gift card for completing the first interview and a \$15 Amazon gift card for the second.



Table 1

*Participant Background Information*

Pseudonym	Class Year	Gender	Race	Highest Parental Education Level	Institution Type	Academic Major
Christy	First-Year	Woman	African American/Black	Graduate degree	Public	Technology Education
Monica	First-Year	Woman	White	Bachelor's degree	Public	Science Education
Taylor	First-Year	Woman	White	Graduate degree	Private	Mathematics
Victoria	First-Year	Woman	White	Some college	Public	Middle Grades Math & Science Education
Zoe	First-Year	Woman	African American/Black	Graduate degree	Private	Environmental Science & Political Science
Jenna	Sophomore	Woman	White	High School or GED	Public	Middle Grades Math & History Education
Kristen	Junior	Woman	White & Hispanic/Latina	Graduate degree	Private	Middle Grades Math Education & Experiential Education
Kyle	Junior	Man	White	Some college	Public	Technology Education
Matilda	Junior	Woman	White & Hispanic/Latina	Graduate degree	Public	Chemistry
Felicity	Master's Student	Woman	American Indian	Associate's degree	Public	Master of Arts in Teaching (Math)

*Note.* Participants selected their own pseudonyms. The names of some academic majors have been altered to more general terms to protect participate confidentiality.

**Data Analysis**

Student interview, survey, and timeline data were analyzed in multiple phases. In the first cycle of coding, I used structural and in vivo coding processes (Saldaña, 2016). In structural coding, large segments of text are identified on broad topics and indexed into more comparable segments. For this process, conceptual schemata served as a deductive foundation for identifying costs and benefits related to participating in the NCTFP, information access and processing, and present bias. Once organized, I inductively coded data

within each conceptual scheme using in vivo coding, with special attention to data related to college choice, major choice, and career plans. In vivo coding identifies codes derived from participants' actual words, directly reflecting participant behaviors, processes, and views (Saldaña, 2016). Data from NCTFP coordinators were treated as functional, corroborating student data sources and providing a robust case context.

Following first-cycle coding processes, I conducted member checking in second interviews with student participants (Saldaña, 2016). Ethical and trustworthy qualitative research is steeped in collaborative process, and participant feedback was critical to validating emerging findings. Code clusters identified during first-cycle coding were shared with participants in second interviews to elicit participants' feedback on accuracy and fit. Member checking generated additional nuance to cluster definitions and organization in preparation for the final stage of data analysis, focused coding. Focused coding is a second-cycle coding practice where categories are further developed by properties and dimensions based on comparability and transferability, emphasizing the most frequent, salient, or significant experiences across participants (Saldaña, 2016). Focused coding allowed for the organization of data by college choice, major choice, and career ideas and plans, and the collapse and prioritization of themes under each decision process, resulting in the themes below.

### **Findings**

This study explores how the newly-introduced North Carolina Teaching Fellows Program shaped participants' college and career decisions related to institutional choice, academic program choice, and career plans in teaching secondary STEM education. First, analysis revealed two themes related to how the NCTFP influenced college choice (applicable to the six participants who were choosing institutions at the time the NCTFP was announced): some participants saw institutions that they were already interested in as newly financially accessible, while the NCTFP motivated other participants to select institutions that became the most cost-effective option within their choice set. Next, two themes related to major choice highlighted how some participants were drawn to the NCTFP because they had already planned to study STEM education, while others newly committed to STEM education to receive program benefits. Finally, three themes related to career plans highlight the experiences of participants who newly began considering teaching careers as a result of the NCTFP, participants' concerns about teaching in North Carolina long-term, and participants' uncertainties regarding teaching in low-performing schools. All college, major, and career decisions influenced by the NCTFP were motivated by the forgivable loans associated with the program, which were largely treated as a financial certainty among participants. Overall, findings show that the NCTFP had an important, albeit differential influence on the multiple postsecondary decisions examined among the 10 participants, as summarized in Table 2.

Table 2

*Reported Influence of the NCTFP on College, Academic, and Career Plans*

Pseudonym	NCTFP Influenced College Choice	NCTFP Influenced Enrollment in Teacher Preparation Program	NCTFP Influenced Enrollment in STEM-Related Academic Program	NCTFP Influenced Plans to Work in NC	NCTFP Influenced Preferred Type of School to Teach In
Christy	Somewhat	Yes	No	Yes	Unsure
Monica	No	Somewhat	Somewhat	No	Unsure
Taylor	Somewhat	No	No	No	Unsure
Victoria	Yes	No	Yes	Yes	Somewhat
Zoe	Somewhat	No	Yes	No	No
Jenna	N/A	No	No	No	Unsure
Kristen	N/A	No	No	Somewhat	No
Kyle	N/A	No	No	Somewhat	Somewhat
Matilda	N/A	No	No	Somewhat	Unsure
Felicity	Yes	No	No	No	No

*Note.* Reported influences come primarily from participants' responses to the initial interest survey.

Participants with N/A influence on college choice were already enrolled at partner institutions at the time the NCTFP was introduced.

### Choosing NCTFP Partner Institutions

Of the 10 study participants, six were making institutional choices at the time of the announcement of the new NCTFP: five incoming first-year undergraduates and one incoming master's student. The announcement of the NCTFP's partner campuses critically influenced college choice for five of the six. Each of these students (and/or their parents) were highly cost-conscious, weighing tuition and fees heavily into college decisions. For most, the NCTFP's forgivable loans provided a proximal solution to this salient challenge, whether enabling attendance at a more expensive but preferred institution, or whether reducing overall anticipated college costs, compelling some participants to consider and newly commit to NCTFP partner institutions. The four remaining participants were already enrolled in college at the time the NCTFP was announced and happened to be at institutions that were named partner institutions. While continuing students can transfer institutions to participate in the NCTFP, none of the participants in the present study had done so.

### *Enabling a Preferred Choice: "Closing the Private School Gap"*

For Taylor and Zoe, the NCTFP made a preferred institution financially viable. Both Taylor and Zoe had identified top choice colleges through their personal networks and in interactions with college recruiters. For both students, top choice institutions were private and, despite their interest, both were uncertain whether they could afford to attend these schools. Zoe describes having "enough money" to attend a public institution, but "not quite enough money" to go to a private institution. Zoe's and Taylor's parents both also discouraged their attendance at private institutions without financial support: "I wanted to go to [private institution], but my mom was like, 'you're not going unless you get a lot of money'" (Taylor). When the students' top choice institutions became NCTFP partners, both students saw the NCTFP as a means to "close the private school gap" (Zoe), using program loans to meet immediate financial needs by offsetting

high tuition costs. Acceptance into the NCTFP enabled both Zoe and Taylor to financially justify attending institutions that were otherwise seen as too expensive.

### ***The Most Cost-Effective Option: “I Don’t Want Student Debt for You”***

For the remaining four participants choosing institutions at the time of acceptance to the NCTFP, college choice came down to total anticipated cost. A first-generation college student, Victoria and her parents were worried about college cost: “[My parents] were like, ‘We don’t want you to be in debt the rest of your life. As a teacher, you’re not going to be making a lot of money. You’re never going to be able to pay this money off.’” Upon researching college options, Victoria began to consider community colleges. However, when a public institution near her hometown was named an NCTFP partner, Victoria applied and was accepted. With NCTFP funds, Victoria lived at home and commuted to campus, allowing her to attend her first semester “completely for free.”

Felicity and Monica each applied to multiple in-state institutions, planning to choose the most cost-effective option. When Felicity was accepted to the NCTFP and received a separate merit scholarship from an NCTFP partner institution, it became the most affordable choice: “to get the Teaching Fellows thing, I had to go to [institution], which is where I had also gotten the other scholarship. It all worked out.” Felicity still needed to borrow, taking out “only a little bit of a loan” to cover living costs. While Monica approached her selection process similarly, her top choice institution—her father’s alma mater—ended up being the “best financial option” regardless of the NCTFP funds. Between the NCTFP and other aid sources, Monica estimates that she took out “a \$5,000 loan for [her] first year of college.”

Although Christy also prioritized cost, her parents had the ultimate say in her college decision. Christy had wanted to attend a larger, out-of-state institution to study computer science. Although she was accepted to an institution that met her goals, her parents were concerned about costs and encouraged Christy to apply to the NCTFP. When Christy was accepted, her parents pushed her to participate:

I was okay with taking out loans and doing whatever I had to do. My parents weren’t... my parents were like, “No loans, we’re not doing that.” That’s a big reason why I didn’t go to [the out-of-state institution], the money and my parents saying, “I don’t want student debt for you, I don’t want you to have things to worry about besides college.”

To reduce college expenses, Christy ultimately chose the NCTFP partner institution.

### **Choosing Academic Programs in STEM Education**

Like with college choice, the influence of the NCTFP on students’ major choices varied by participant based on the alignment of policy requirements with students’ existing interests. For participants already planning to pursue STEM education, the NCTFP only reaffirmed their interests. For participants not originally interested in STEM education but who found the NCTFP’s benefits compelling, the decision to participate was more complicated and required a change in plans.

### ***Alignment with Existing Interests in STEM Education: “Whoa, That’s Me”***

Five participants (Taylor, Jenna, Matilda, Kristen, and Felicity) were already planning to become STEM teachers before the NCTFP, and Monica was also considering a teaching career in science or special education. Once the program was announced, each of these participants found the NCTFP attractive because of its alignment with their existing plans. Matilda remembers first hearing about the program: “I looked at it and it’s STEM and special education only and I was like, ‘Well, I’m STEM, so I should try it.’”

Felicity was also pleased to see that the program fit her goals: “Teaching Fellows...only applied to special ed, science, and math. I was like, ‘Whoa, that’s me.’”

Notably, the NCTFP was designed to newly recruit students into education majors and, as such, students already in teacher preparation programs are ineligible to apply. Despite this policy, nine of the 10 participants were either already studying education or had already planned to (Christy as the exception), and seven were already pursuing, or planning to pursue, STEM or special education (Victoria, Zoe, and Christy as the exceptions). NCTFP program coordinators attributed the discrepancy between policy and practice to differing academic program structures across institutions. Some campuses justified eligibility on the basis that students had not yet reached the “teacher preparation” phase of their education program while, at other institutions, students majored in their subject area specialty (e.g., mathematics), making them eligible for the NCTFP even if they were also already working toward teaching credentials. For participants already interested in STEM education, the NCTFP was a convenient opportunity to get funding in a way that aligned with their existing academic plan.

### ***Newly Committing to STEM Education: “Teaching Science is Not That Bad”***

For three participants (Christy, Zoe, and Victoria), participating in the NCTFP required compromising academic majors and subject area interests. Christy had hoped to study computer science but needed to change these plans to participate in the NCTFP. Christy chose technology education as a way to learn some of the same technical skills (thus, leaving her long-term career options open) while “getting a little help paying for school.”

In contrast, Zoe and Victoria had already planned to become teachers, although not in STEM. However, both saw the NCTFP as a way to meet their college-going goals (for Zoe, attending a top choice private institution, for Victoria, attending a four-year institution), and both chose to forego their preferred subject areas to participate in the NCTFP. Even though Zoe “doesn’t like science,” she had always performed well in the subject and she had enjoyed watching her grandfather teach middle school science. While Zoe chose science education, she also described pursuing licensure in social studies or language arts once her NCTFP service is complete. Like Zoe, Victoria also performed well in math and science but never had a strong interest in either subject. Instead, Victoria had originally hoped to become an elementary school teacher. Victoria recalls asking, “Am I sure I want to change up my entire career path just for a scholarship?” Victoria’s parents encouraged her to “take the money, take the money” while guidance counselors helped her evaluate options. Victoria decided to participate in the NCTFP, leading her to pursue middle school education. Victoria is still deciding between specializing in science or math.

While the NCTFP also shaped Monica’s decision to pursue science education, Monica had already been considering a teaching career in either science or special education. Monica initially chose special education but switched to science after she learned that her institution (the most affordable option, and her top choice school based on it being her father’s alma mater) did not offer special education. While the NCTFP therefore led Monica to choose science education, she would have likely studied STEM or special education regardless of the NCTFP. For Christy, Zoe, and Victoria, the NCTFP loans served as a sufficiently compelling benefit to change academic plans.

### **Career Plans**

For two participants (Christy and Kyle), the NCTFP newly prompted plans to enter teaching careers, if only in the short-term. This theme explores the ways in which the NCTFP influenced participants’ interest in teaching jobs, including plans to teach in state and to teach in low-performing schools, as incentivized by the NCTFP. Importantly, participants treated the NCTFP loans as a financial certainty, expressing almost no concern about funds converting to loans. In interest surveys, nine participants indicated they were “very certain” that they would fulfill all requirements for loan forgiveness. Matilda was the only participant to select “fairly certain,” which she explained based on the possibility of unexpected events: “I might get run

out of the school by children throwing tables at me. I don't think that will happen, but I don't know." Despite overall confidence, participants' decisions tended to reflect their immediate needs, even if distal commitments were ill-aligned with long-term goals.

### ***Newly Committing to Teaching: "I'll Go Teach, I'm Not Opposed To It"***

While most participants had already seriously considered teaching careers prior to the NCTFP, Christy and Kyle both newly considered teaching as a direct result of the program. Both participants enrolled in technology education programs and believed that their degree would prepare them not only for teaching, but for careers in industry as well. Although Christy was exposed to education through her mother's work in teaching and school administration, she had never seriously considered a teaching career herself until her parents encouraged her to join the NCTFP to avoid student loans. Still, Christy wondered about the payoff of the decision:

It was in the back of my mind, if I go to [out-of-state institution], I will be spending however many thousands [but] if I do computer science, it would help, it would make it worth it. But...I don't really have a financial burden on me right now [in the NCTFP] and I have decided to go into a profession that pays significantly less.

Still, Christy is optimistic about teaching and reports enjoying her NCTFP experience thus far. Like Christy, Kyle had not planned to teach prior to the NCTFP. Kyle enrolled in college planning to study engineering but began to consider alternative paths when he struggled in pre-requisite courses. A professor encouraged Kyle to look into technology education to "have more opportunities after college to get hired, either in industry or with teaching." Kyle was impressed with the job placement rates in technology education and planned to switch his major. Immediately after, Kyle's institution was named an NCTFP partner and he applied for the program: "I just saw, 'Oh they'll give you \$8,000-something a year.' I was like, 'Alright, the less money I have to pay back, the better.'" Kyle describes "going in blind" and had not realized that the NCTFP required post-graduate teaching service. Kyle says, "I thought it was just a scholarship, but it's a forgivable loan...I was like, 'Alright that's fine, I'll go teach, I'm not opposed to it'...I'm like, 'Well, alright. Okay, I guess.'" Even though Kyle initially indicated he was "very certain" he would complete all program terms and is currently planning to teach "real quick" to have his loans forgiven, Kyle is also considering applying to industry jobs to see if he receives a salary offer that would justify paying back the loans in cash instead of teacher service. For both Christy and Kyle, the funding offered by the NCTFP—whether fully understood or not—was sufficiently compelling to alter career plans, even if short-term.

### ***Staying in State: "Teachers in North Carolina Don't Get Paid Very Well"***

Five participants (Christy, Victoria, Matilda, Kristen, and Kyle) who had not necessarily planned to stay in North Carolina after graduation were now planning to do so, at least short-term, as a result of the NCTFP. Perceptions of teaching conditions in the state were largely negative; participants frequently received advice not to teach in-state due to low teacher pay and regressive education policies. Taylor's mom encouraged her to pursue teaching jobs "up north, because that's where they pay." Felicity's family also tried to dissuade her: "They were like, 'Teachers in North Carolina don't get paid very well. It's not a valued profession.'" Victoria describes:

Teachers in North Carolina just don't make enough money in order for me to feel like I could make a living for myself and enjoy my life...A lot of teachers have told me, "Are you going to teach in North Carolina? You're not going to teach in North Carolina, right? You're leaving here, right?" That was something that's always been pressed into me: "Do not teach in North Carolina. Do not do that."

Even if the NCTFP effectively motivated participants to plan to teach in-state after graduation, some anticipated leaving after their service. Victoria plans to leave the state once she meets her service requirements, "The only reason I was even getting my degree in North Carolina is simply for the in-state tuition." For Matilda, who plans to pursue a master's degree after her bachelor's, the state's lack of incentive pay for teachers with graduate degrees is "the reason [she] is going to leave" after completing NCTFP service. As the only participant not from North Carolina, Kristen also saw teaching in-state as a short-term arrangement, and an opportunity to give back: "North Carolina public schools aren't the best, so [my out-of-state classmates and I] believe that our education will give us the ability to help."

The only participant who spoke optimistically about the state's teaching conditions was Christy. Christy had exposure to education policy movements in North Carolina through a summer position in local government and as part of her institution's NCTFP professional development activities. Christy's mom has also become politically active in education reform in North Carolina, encouraging Christy to pursue education because she believed that "there are going to be a lot of changes going on with teachers in the future."

### ***Low-Performing Schools: "I Don't Know What That Means"***

As participants discussed their future job ideas as they related to the NCTFP, the least developed part of students' plans was their interest in teaching in a low-performing school. Across interviews, it was clear that most participants did not fully understand this policy component and were also unsure about which schools qualified as "low-performing" (a term participants frequently conflated with "low-income" and "Title I"), as well as what it would be like to teach in these environments. Overall, participants did not feel like they had enough information to make informed decisions about preferred school types, even though the new NCTFP was designed to promote their entry into low-performing schools. When asked whether she planned to teach in a low-performing school, Jenna responded: "I'm not sure yet, because I don't exactly know what that means. I feel like I should [know], but I don't." Matilda was interested in teaching at a low-performing school but was uncertain about what it would entail: "The idea of working in a low-performing school...that is everything that I'm passionate about, but I just don't know if I'm good enough to do it." NCTFP coordinators echoed these concerns; while the state's original NCTFP had an intensive professional development curriculum that exposed students to different school types, the new NCTFP lacks the same programmatic and financial resources to offer this experience.

Those who expressed a preference on whether they planned to enter a low-performing school relied on personal experiences and the advice of trusted mentors in making these decisions. For instance, Kyle and Zoe both attended schools that predominantly served low-income students and both expressed an interest in teaching in similar environments. Zoe described, "[In college] I found out that every school that I attended growing up was low-income, and I had no idea. I was like, 'So, you're telling me those schools are struggling? What does low-income really mean?'" Zoe connected her experience with the NCTFP incentive: "[The NCTFP] kind of forces me into a low-income school, which was what I wanted anyways." In her first interview, Zoe listed two schools where she was interested in teaching that she believed qualified as low-performing. Between interviews, I looked the schools up, finding that only one met the state's definition of low-performing. In our second interview, I brought this up and Zoe was surprised, explaining that she had not realized that the NCTFP incentivizes *low-performing* schools instead of *low-income* schools. Still, she reported that the information doesn't necessarily change her interest in this school, as she is "happy to go anywhere that needs any kind of help." Zoe is especially interested in teaching at a "low-income" school

because of her own educational background and because she feels that these schools are where resources, programs, and good teachers are needed most: “I want to get into a school where I can start something...I don’t want to go to a school that’s already got it all figured out.”

For other participants, insight about the nature of low-performing schools came from family members, especially those with teaching experience in these settings. Taylor reports that the biggest decision about her post-graduate teaching plans related to “whether [she] want[s] to do four years in a Title I school or eight years in a public school” (note the conflation of “Title I” with “low-performing”). In the initial interest survey for this study, Taylor indicated that she was not planning on teaching in a low-performing school immediately after graduation and, in her first interview, she explained that this was based largely on advice she had received from her mother:

My mom had worked in a Title I school and she was like, “They’re great, but if you go there right off the bat, you’re going to get burned out. It’s hard to teach kids when you’re learning how to become a teacher and you’re also trying to teach kids who might not have had breakfast in three days... if you want to go to Title I that’s great but learn how to teach first.”

Christy’s understanding of low-performing schools also came from her mother’s experience. When asked about her interest in low-performing schools, Christy expressed concern about the lack of available resources in such schools, especially in the context of teaching technology education. As part of an NCTFP professional development event on her campus, Christy has also heard speakers from different types of schools, which helped her think more about her options. At the time of the second interview, Christy was leaning toward teaching at a low-performing school for two reasons: the opportunity to make a larger impact and access to quicker loan relief, which would allow her to move out of North Carolina more quickly, which was “really just [her] only goal right now.”

Beyond Christy, the incentive for faster loan forgiveness associated with teaching in low-performing schools piqued the interest of other participants as well, especially those who sought to complete their service and move on to other opportunities. Like Christy, Victoria was interested in teaching at a low-performing school in order to leave North Carolina more quickly. While this was Kristen’s original plan as well, especially since she looked forward to returning to her home state, Kristen had recently reconsidered:

For a while I was like, “I want to be done with [NCTFP requirements] more quickly.” But now I want more experience. It just gives me time to relax and decide what I want to do...if I do a low-performing school, I just know for myself that I’ll be like, “Okay, my two years are up, I am able to do other things now,” then I’ll look into other things. But I don’t think that two years at one school is enough to really understand the school itself.

Although Kyle reported interest in working at a “low-income” school based on his personal educational experience, Kyle was primarily interested in low-performing schools for faster loan relief: “I’ll probably try and go to a low-performing school... I want to just get in, see how I like it, and if I end up not liking it I’ll only have to do two years instead of four.” While some participants were drawn to low-performing schools to make an impact, this policy component seemed to also have the unintended consequence of appealing primarily to participants who were most interested in leaving STEM education, North Carolina, or teaching careers altogether.

## Discussion



Although the North Carolina Teaching Fellows Program was designed as a recruitment tool for the teaching profession, findings demonstrate that the program was most compelling for those whose college, academic, and career goals already aligned most closely with the program's requirements. Participants whose interests aligned with the NCTFP were most eager to join and saw minimal costs in doing so, especially because all participants expressed high levels of confidence that they would complete the program's teaching requirements. Findings also provide some evidence that the NCTFP funding sufficiently compelled some participants' decisions to newly consider teaching careers, STEM education, staying in North Carolina (at least short-term), and to teach in low-performing schools.

For the six participants who were accepted into the NCTFP while they were choosing institutions, the NCTFP met immediate needs at a critical time. Each of these six participants treated the NCTFP funds as an actualized benefit, even though the program funds that participants receive are loans until their post-graduate teaching service is complete. For some participants, present-biased needs and desires such as college choice took priority over longer-term academic and career decisions. Zoe and Taylor both opted to attend private institutions once they were admitted to the NCTFP, since the program lessened their upfront college costs. Neither participant considered the potential implications of the funds turning to loans if they did not complete the required teaching service. For Zoe and Victoria, attending a desired college outweighed the importance of academic major and post-graduate career commitments and, despite their mutual disinterest in majors and careers in STEM education, both chose to pursue STEM education majors to afford preferred institutions. Christy also compromised her preferred academic major to reduce college costs by attending a more affordable institution and receiving NCTFP loans, although this decision was not based on Christy's desires, but rather her parents' concerns about student debt.

As the NCTFP is structured so that those who are furthest from loan forgiveness and/or payback (incoming first-year students) receive the greatest financial benefit (\$8,250 per year, for a total of \$33,000), the program may be most compelling to undergraduates newly entering postsecondary education. Whether due to temporal mismatch or greater malleability of academic and career plans at earlier stages of academic trajectories, first-year students were the participants most likely to adjust their college choice and academic interests to participate in the NCTFP. The appeal of receiving upfront financial benefits to meet present goals is consistent with existing research concluding that financial aid programs that provide upfront support are highly attractive to students (Beggs et al., 2008; Castleman et al., 2015; Dynarski & Scott-Clayton, 2006; Field, 2009; Gandhi, 2008).

Although the NCTFP was most compelling to students who held existing interests in STEM education, findings provide some evidence that the NCTFP has the potential to influence entry into STEM education and/or the teaching profession as a whole. Neither Christy nor Kyle had planned to become teachers prior to the NCTFP, and both joined to reduce college expenses. Notably, both hope to pursue other careers long-term. Although other participants were also motivated by the NCTFP loans (e.g., in the decision to pursue STEM education instead of another subject area), these participants weighed financial benefits alongside existing intrinsic interests in teaching. While the NCTFP has the potential to shape students' college, major, and career decisions in the short-term, its long-term influence remains to be seen.

### **Implications for Policy and Practice**

While findings show that the NCTFP loan forgiveness program design has the potential to motivate some students' plans to enter teaching careers, this motivation may be short-term or otherwise limited. Existing research has found that the similarly-structured TEACH Grant has not impacted entry into teaching careers, although it may affect the types of teaching positions students pursue (Barkowski et al., 2018; Peyton & Kramer, 2017). While similar, the NCTFP and TEACH Grant programs differ in several critical ways, namely the NCTFP's positive reputation within the state based on an old program of the same name, and the NCTFP's professional development activities for student participants (which the TEACH Grant lacks). It is possible that students who join the NCTFP without a prior interest in teaching could develop interest in the career through such experiences. However, if Teaching Fellows enter the NCTFP primarily or strictly

to meet college costs and without a strong motivation to become teachers, their entry into teaching could be detrimental, not only to their personal satisfaction but also to their effectiveness in the classroom.

In its current form, the NCTFP excludes college students already enrolled in teacher preparation programs from applying based on the program's goal of newly recruiting students into the field. However, the experiences of participants show this restriction to be ineffective in current practice. Not only does this constraint differentiate eligibility by institution based on varied academic program designs, it also prevents the participation of candidates who are most committed to teaching. Officially opening eligibility to students already pursuing education majors and academic programs may be an optimal strategy for directing students who are already intrinsically driven toward the profession into needed subjects and schools.

Further, if the NCTFP or other programs like it seek to effectively recruit students to teach in low-performing school environments, training is imperative. Participants generally lacked exposure to low-performing school environments but were interested in learning more. For participants who had already planned to teach STEM long-term, especially in-state, the incentive to teach in a low-performing school to alleviate loans more quickly was not compelling. Instead, the incentive was most attractive to students who were eager to leave teaching, leave secondary STEM education, and/or to leave North Carolina. Research on teacher shortages suggests that low-resourced schools tend to have the greatest difficulty attracting and retaining teachers, especially in high-needs subjects like STEM (Aragon, 2016; BEST NC, 2018; Clotfelter et al., 2011). Incentivizing graduates who have limited intrinsic interest in staying in their positions long-term could perpetuate the high turnover rates that these schools already experience. Instead, incentives that are better aligned with teacher retention, such as tailored professional development opportunities or extra funding for instruction, classroom materials, or technology may support new teacher success in these schools while simultaneously benefitting student learning. Alternatively, teacher bonuses or additional loan forgiveness that targets entry into low-performing schools, especially if dispersed over longer period of time to promote retention, could help motivate program participants towards entering and staying in these positions, rather than using shorter terms of service as an incentive.

Low teacher salaries may be an especially strong deterrent for students in STEM-focused academic programs considering careers in education (Carnevale et al., 2015; Marder et al., 2017). While the NCTFP may help to retain teacher talent within the state through participants' required terms of service, findings reveal that participants generally perceived North Carolina to have poor teaching conditions. In order to incentivize NCTFP participants and other teacher talent to stay in state long-term, North Carolina should consider larger-scale changes to enhance teacher conditions, including higher salaries, greater public support of education, and incentives for master's degrees—many of the same conditions educators within the state are already advocating for (Hui, 2019). Additionally, to reduce salary inequities within the state (NCACC, 2017) and to attract new teachers to schools and geographic areas where they are needed most, North Carolina could introduce supplements for teachers in low-performing, low-income, and/or rural schools to offset salary differences between the greatest- and least-resourced schools in the state. Increasing teacher pay and improving conditions on a larger scale may attract more college students into teaching and alleviate the necessity of complex financial aid programs such as the NCTFP that are only available to a select number of students.

One structural critique of the new NCTFP is the lack of diversity among the five partner institutions selected for the program, all of which are predominantly White institutions in urban and suburban areas. Students who are racially minoritized and lower-income tend to be more affected by geography in college choice (Hillman, 2016), and the lack of geographic diversity among the current set of partner institutions, as well as the absence of MSIs, particularly HBCUs, may limit the participation of students who hold identities and affiliations underrepresented within the state's teaching workforce. As the state's rural areas and low-performing schools struggle to attract new teacher talent, using programs like the NCTFP to recruit and train college students from these areas or schools may help to address this gap.

In general, continued partnerships between policymakers and institutions is critical to the success of a program like the NCTFP. Because this study was conducted in the program's inaugural year, long-term student outcomes remain to be seen. However, campus coordinators can communicate challenges to policymakers and government officials to improve the program and to more effectively support students at various stages of program engagement. One challenge consistently shared by campus coordinators was the lack of funding available to provide professional development. Given the NCTFP's goals of newly attracting students to teaching majors and careers in STEM and special education, and to low-performing schools, training may make an important difference to participants' informed decision-making, with implications for their preparation, motivation, and long-term commitments to these roles.

High school counselors and financial aid professionals may be well-positioned to bridge a critical gap between complex policy stipulations and student interest and engagement with programs such as the NCTFP. As findings demonstrate, students and their parents were highly attentive to college costs, especially when choosing institutions. An interest in reducing college expenses drove all participants to pursue the NCTFP and some participants made college choices and changed academic and career plans in order to access forgivable loans associated with the program. For Victoria, high school counselors were essential for understanding whether the NCTFP was a good fit for her career goals, since her parents were only attentive to the financial component of the program. Through familiarity with federal-, state-, and institutional-level programs that reduce college costs, high school counselors can help students make informed academic decisions that also address financial needs. For instance, North Carolina implemented the NC Promise program in 2018, which enables attendance at Western Carolina University, UNC Pembroke, and Elizabeth City State University for \$500/semester. All three institutions offer education programs and may serve as alternative options for cost-conscious students considering careers in teaching, without the post-graduate commitments. While high school counselors already have a notoriously high workload, the availability of resources and support systems related to financial aid programs may help students make individual decisions that fit their needs best.

In the case of the NCTFP, partner institutions should be well-informed about program stipulations, with financial aid officers partnering with education programs to craft communication strategies that connect students to financial counseling and other available resources to help students consider their individual situations in the context of program requirements. Further, financial aid personnel can partner with program coordinators to make sure student participants have all the information they need to make informed decisions that impact service requirements and repayment terms, such as understanding which schools qualify as low-performing. Unfortunately, some participants may make decisions while lacking information that has important short- and long-term effects on their academic and career trajectories. Student decisions are critically influenced by information available, and institutions and policymakers alike can play an important role in supporting informed decision making processes that promote student financial success while achieving the larger goal of building an effective teacher workforce.

## **Future Research**

While the present study begins to fill a gap on research related to loan forgiveness programs designed to recruit new teachers, there is still much to be learned. Research suggests that college students often change their majors (Astorne-Figari & Speer, 2019) and that many new teachers leave the profession in their first few years (Gray & Taie, 2015). It remains to be seen whether the participants in this study will take the pathways they envision for themselves. According to time-inconsistent principles and data from the original NCTFP and similarly-designed programs like the TEACH Grant, there is a high likelihood that not all participants will complete program requirements as planned. Future research, then, would benefit from a longitudinal perspective, following up with participants from this program, or others, at the time they are exiting college or once they have begun their careers. Such research would provide further insight into the concepts guiding this study, as well as the effectiveness of the NCTFP policy design.

While analyzing the role of participants' identities on career decisions was outside the scope of this study, additional research may seek to understand perceptions of teaching careers based on characteristics such as race, gender, socioeconomic status, or geography. Existing research shows that sociocultural variables and demographics can influence students' experiences in school and perceptions of their teachers (Bianco et al., 2011; Egalite & Kisida, 2018; Putman et al., 2016; Redding, 2019), and additional research in this area could help maximize recruitment of groups underrepresented within teaching careers. Because women and racially minoritized groups are critically underrepresented within many STEM fields and disciplines (National Science Foundation, 2019), promoting the success of a more diverse group of STEM educators may be one step towards addressing this gap.

While the NCTFP offers an interesting case study in the context of loan forgiveness programs, especially those designed to recruit and retain teachers, it is not the only program of its kind. Data and research on loan forgiveness programs are sorely needed, especially given the prevalence of these programs at federal, state, and institutional levels. Research on these programs is severely lacking due in part to the limited availability of outcome data, and the limited accessibility of data to researchers. Although each policy has its own nuances, beginning to understand the impact of loan forgiveness and similar incentive programs on students' college, academic, and career choices and plans can help policymakers to better meet student needs, especially in the context of rising college costs.

### **Conclusion**

This study provides insight into the ways that a newly-introduced state-level loan forgiveness teacher recruitment policy influenced students' college, major, and career decisions. Financial benefits offered by the NCTFP have the potential to influence college choice by directing future teacher talent toward partner institutions. The NCTFP benefits also compelled some participants' interest in STEM education and others' career plans in teaching, including staying in-state to meet program requirements and newly considering teaching in low-performing schools. Future research is required to observe longer-term program outcomes, and to understand the ways that financial incentive programs can better meet students' needs and promote their success into teaching careers in subjects and schools where they are needed most. As enrollment in teacher preparation programs continues to decline, postsecondary institutions and policymakers at all levels of governments must respond, as college costs and financial support play a critical role in students' interests and decisions related to teaching careers.

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**Appendix***2018-2019 North Carolina Teaching Fellows Program Summary*

Component	Criteria
Applicant criteria	<p>Incoming undergraduate students (must separately obtain acceptance at a partner institution), current undergraduates transitioning into an eligible academic program, or bachelor's degree holders pursuing an eligible licensure or a master's degree. Undergraduates already enrolled in a teacher preparation program are ineligible.</p> <p>High school applicants or those with &lt;24 college credits: GPA of at least 3.0 and at least 24 on the ACT or 1100 on the SAT. Applicants with &gt;24 credit hours: GPA of at least 2.7. There are no specified academic criteria for applicants with bachelor's degrees.</p>
Subject area requirements	STEM education: middle school/high school mathematics, science, earth science, physical science, biology, physics, chemistry, agriculture, or technology; or special education.
Partner institutions	Must attend a partner institution: Elon University, Meredith College, NC State University, UNC Chapel Hill, UNC Charlotte
Funding	Up to \$8,250/year in forgivable loans (\$4,125/semester). High school applicants: eligible for up to 8 semesters of funding; undergraduate applicants with <24 credits: eligible for up to 6 semesters of funding; applicants with >24 or more college credits (including bachelor's degree holders): eligible for 4 semesters of funding.
Professional development	Required participation in program-wide events (at least 1 event annually) and campus-specific activities and requirements.
Loan forgiveness requirements	1 year of teaching in a qualifying position at a low-performing public school in NC for every 1 year of funding received <i>or</i> 2 years of teaching at a non-low-performing school for every 1 year of funding received. Service must be completed within 10 years of degree completion.
Cash payback	If loan forgiveness requirements are not met via service, funding must be paid back with 8% interest within 10 years of graduation.

*Note.* Source: North Carolina Teaching Fellows (n.d.). Summary details reflect the NCTFP in 2018-2019. Terms and requirements of the 2018-2019 NCTFP differ from those of the original 1987-2011 program of the same name.