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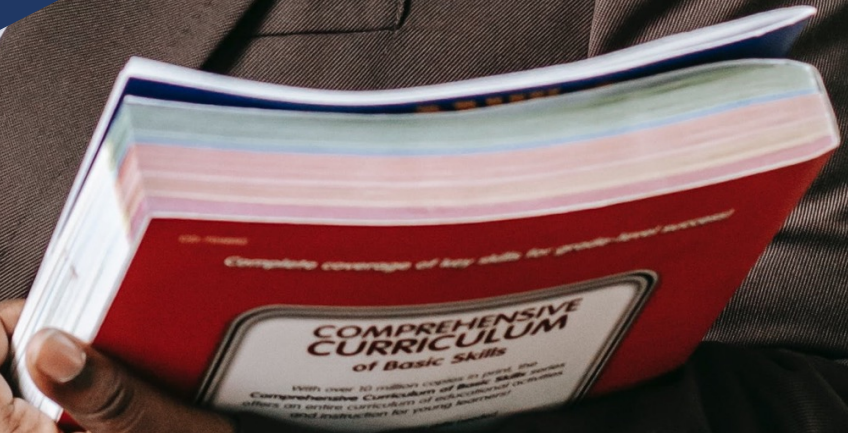
Becker, J., Tedona, E., & Togna, M. (2023). Economic Evaluation of Teacher Induction Programs: A Report. Richmond, VA: Metropolitan Educational Research Consortium.

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VCU

School of Education



ECONOMIC EVALUATION OF TEACHER INDUCTION PROGRAMS: A REPORT

a MERC research report

ABOUT THIS REPORT

Research shows that teacher induction programs can be effective as measured by a number of outcomes. However, research also shows that teacher induction programs vary greatly from one district to another. Furthermore, there is no research that examines teacher induction programs with respect to costs and benefits. Educational leaders and stakeholders do not need to wait on formal institutional research to do such an economic evaluation.

This report, in combination with a [How-to-Guide](#), the [Teacher Induction Program Cost Matrix](#) and the [Teacher Induction Program Benefit-Cost Workbook](#), comprises a toolkit designed to allow school and district leaders to conduct an economic evaluation of their teacher induction program.

Publication Date

November 2023

Recommended Citation

Becker, J., Tedona, E., & Togna, M. (2023). *Economic Evaluation of Teacher Induction Programs: A Report*. Richmond, VA: Metropolitan Educational Research Consortium.

A report by the Metropolitan Educational Research Consortium

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CONTENTS

INTRODUCTION	1
BRIEF REVIEW OF THE LITERATURE ON TEACHER INDUCTION PROGRAMS	2
The Contexts for Teacher Induction	2
<i>Figure 1. Components of a Comprehensive Induction Program</i>	3
The Effects of Teacher Induction Programs	3
ECONOMIC EVALUATION IN EDUCATION	5
<i>Table 1. Types of Economic Evaluation (SOURCE: Levin et al., 2018)</i>	7
Inputs/Ingredients	8
The “Ingredients” of Teacher Induction Programs, Generally	10
The “Ingredients” of Teacher Induction Programs, Virginia	11
The “Ingredients” of Teacher Induction Programs, Locally	12
Orientation	12
Mentoring	13
Observation	13
Professional Development / Workshops	13
Utility/Effectiveness/Benefits	14
Utility	14
Effectiveness	15
Benefits	16
PUTTING IT ALL TOGETHER: THE TEACHER INDUCTION PROGRAM ECONOMIC EVALUATION TOOLKIT	17
The Teacher Induction Program Ingredients Matrix	17
<i>Table 2. Teacher Induction Program Cost Matrix</i>	19
The Teacher Induction Program Benefit-Cost Workbook	19
Workbook Cost Tabs	19
<i>Figure 3. Workbook Orientation Tab Example</i>	20
<i>Figure 4. Multiple School Years in the Workbook Example</i>	20
Workbook Benefits Tab	20
Benefits-Cost Analysis Tab	23
LIMITATIONS AND CONCLUSION	24
REFERENCES	26
RESOURCES	30

INTRODUCTION

The teacher labor market has been volatile for a long time and recently that volatility has increased. Based on analyses of national data, [Ingersoll & May \(2012\)](#) found “... an annual asymmetric reshuffling of significant numbers of math and science teachers from poor to not-poor schools, from high-minority to low-minority schools, and from urban to suburban schools” (p. 448). More recently, [an investigation by Chalkbeat released in March 2023](#) concluded that across eight states, there was a clear increase in the share of teachers leaving teaching positions between the 2021-22 and 2022-23 school years (Barnum, 2023).

Additionally, this report is being written at a time when we are emerging from a pandemic and at a time of extreme political volatility. American schooling has been at the center of those storms, putting our school systems under extreme stress and making staffing schools more challenging than it had already been. We do not yet know the full impact of these stressors on the teaching profession, but they are likely exacerbating existing challenges in the teacher labor market. [Kraft & Lyon \(2022\)](#) examined the state of the teaching profession by looking at four interrelated constructs: professional prestige, interest among students, preparation for entry, and job satisfaction. They concluded that those indicators are at or near their very lowest point in over a half century, meaning the teaching profession as a whole is not well. In other words, these new public health and political stressors are landing on top of a profession already (and understandably) struggling.

One particular challenge within the teacher labor market volatility problem is the retention of new teachers. We know that retaining new teachers has always been a challenge, especially in hard-to-staff schools. [Ingersoll et al. \(2018\)](#) found that approximately 44% of new U.S. teachers leave the profession within the first five years. To improve new teacher retention, schools and districts have developed teacher induction programs. There is variability in those efforts, though they generally involve some combination of orientation, mentoring, professional development, and specialized observations. Additionally, some schools and districts might give new teachers reduced schedules or teaching loads as well as extra planning time.

Research has shown that these programs can be linked to better teaching and improved retention rates¹ as well as, in some cases, improved student achievement². However, that research on teacher induction programs examined the effectiveness of teacher induction programs without considering costs. This report, in combination with a how-to-guide, the

¹ [Helms-Lorenz et al., \(2013\)](#); [Ingersoll & Strong, \(2011\)](#); [Rockoff, \(2008\)](#); [Ronfeldt & McQueen, \(2017\)](#); [Smith & Ingersoll, \(2004\)](#)

² [Ingersoll, \(2012\)](#); [Ingersoll & Strong, \(2011\)](#); [Schmidt et al., \(2017\)](#)

[Teacher Induction Program Cost Matrix](#) and the Teacher Induction Program Benefit-Cost Workbook, comprises a toolkit designed to allow school and district leaders to conduct an economic evaluation of their teacher induction program. It affords decision makers an opportunity to examine the costs associated with teacher induction efforts as well as ways they might go about examining effectiveness, benefits or utility of those programs.

The report starts with a brief review of the literature on teacher induction programs followed by an introduction to economic evaluation in education. Following that, there is a section about inputs (costs) and a section about outputs (effectiveness or benefits). The final section puts it all together by introducing the tools, including the [Teacher Induction Program Ingredients Matrix](#) and the Teacher Induction Program Benefit-Cost Workbook.

BRIEF REVIEW OF THE LITERATURE ON TEACHER INDUCTION PROGRAMS

The Contexts for Teacher Induction

Teacher education is typically broken down into pre-service and in-service segments. [Wong \(2004\)](#) refers to teacher induction as separate from those two segments and defines it as a “training and support process that continues for two to three years ... to keep new teachers teaching and improving toward increasing their effectiveness” (p. 42). According to [Ingersoll et al. \(2018\)](#), the goal of teacher induction programs is to “aid new practitioners in adjusting to the environment, to familiarize them with the concrete realities of their jobs, to socialize them to professional norms, and also to provide a second opportunity to filter out those with substandard levels of skill and knowledge” (p. 203). Induction has also been considered a distinct form of professional development aimed at new teachers to be a “bridge from student of teaching to teacher of students³.” Thus, teacher induction is essential to ensure the success, and ultimately the long-term retention, of first-year and early-career teachers.

Implementation of induction programs varies considerably from district to district. [Reeves, Hamilton & Onder \(2022\)](#) write that:

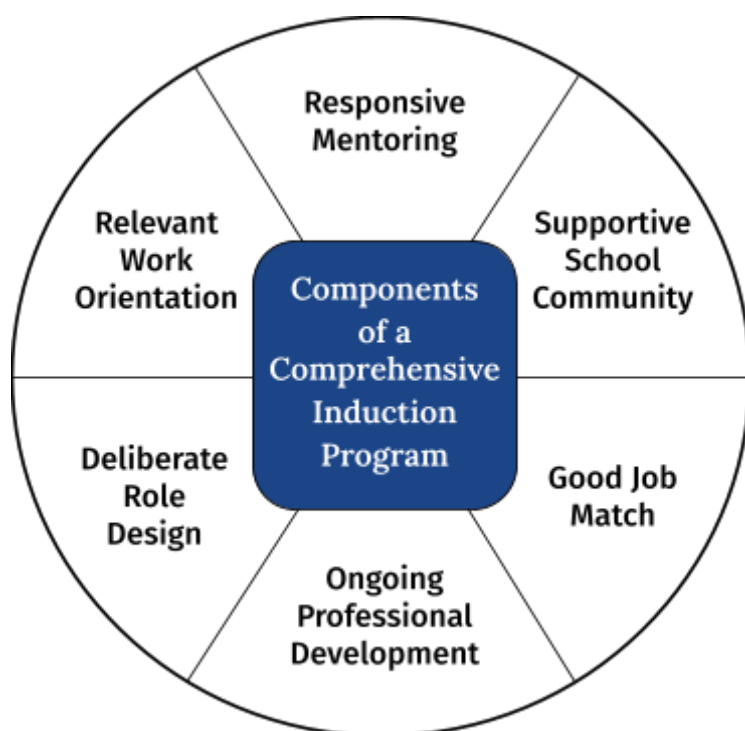
Induction can take the form of mentoring or coaching; collaboration or networking opportunities; teaching observations [both observations of others' teaching, and observation and feedback related to one's (own) teaching]; reductions in teaching

³ [Ingersoll & Smith, \(2004\), p. 29](#)

load and extra planning time; workshops/seminars; orientations; or provision of other resources or supports (e.g., curricular materials) (p. 3).

Induction programs could be general or subject-specific, and they might be tailored to the specific needs of different teachers⁴. While induction programs do vary and can be individualized, they usually involve a combination of activities, and evidence suggests that comprehensive induction programs are generally more effective than singular induction supports⁵. Figure 1 below is based on a representation of a comprehensive teacher induction program developed by the [IRIS Center of the Peabody College of Education at Vanderbilt University](#).

Figure 1. Components of a Comprehensive Induction Program



SOURCE: [IRIS Center of the Peabody College of Education at Vanderbilt University](#)

The Effects of Teacher Induction Programs

[Glickman, Gordon, and Ross-Gordon \(2014\)](#) stated that the teaching profession has long been plagued by inadequate induction of its novices. In their text on effective methods for

⁴ [Smith & Ingersoll, \(2004\)](#)

⁵ [Ingersoll, \(2012\); Wechsler et al., \(2010\)](#)

the supervision of instruction, they discuss how new teachers face a multitude of challenges that include limited access to, or instructions for how to find various resources, challenging teaching loads, and unclear expectations. Additionally, novice teachers, they write, are often met by veteran teacher colleagues and administrators that have a “sink-or-swim” mentality. In other words, veteran educators believe that new teachers are expected to “figure it out” on their own just as they once had to do.

Duke (2010) links a lack of induction or failed attempts at induction to teacher attrition and turnover writing that “teacher retention is a multi-dimensional issue involving induction process, instructional and non-instructional assignments, teacher support and assistance, school leadership and working conditions, opportunities for growth and advancement, and compensation” (p. 188). Duke (2010) continues and states that “veteran teachers joke sometimes about the ‘orientation’ to their first teaching job—they were given a copy of the teacher’s manual, a set of keys to their classroom, and a pat on the back” (p. 188).

Those commentaries are important context, but there is now abundant empirical research on the actual efficacy of teacher induction with respect to retention rates⁶ and even student achievement⁷. In one of the earlier and most cited studies of teacher induction, [Kang and Berliner \(2012\)](#) examined data from two national surveys: the Schools and Staffing Survey (SASS) and the Teacher Follow-up Survey (TFS). They concluded that turnover rates were reduced significantly when first-year teachers were provided induction services that included access to various seminars, common planning time with veteran teacher colleagues, and additional classroom assistance. [Kang and Berliner \(2012\)](#) go on to note that successful induction programs have three characteristics: they are well-thought out and organized, have a focus on professional growth and development, and offer opportunities for peer-to-peer collaboration. [Ronfeldt and McQueen \(2017\)](#) used more recent SASS data as well as another national study called the Beginning Teacher Longitudinal Study (BTLs). They, too, conclude that teacher induction reduces teacher mobility and increases retention. Specifically, they found that teacher retention beyond five years increased when the amount and variation of induction supports increased as well.

More recent attempts to systematically review the evidence of effectiveness of teacher induction programs show mixed results. For example, [See et al. \(2020\)](#), reviewed international evidence and found only mixed-to-weak evidence of effectiveness in retaining new teachers. In reviewing that analysis, though, [Reeves et al. \(2022\)](#) offer that “... sets of induction supports are often bundled in the context of comprehensive induction programs”

⁶ [Helms-Lorenz et al., \(2013\)](#); [Ingersoll & Strong, \(2011\)](#); [Rockoff, \(2008\)](#); [Ronfeldt & McQueen, \(2017\)](#); [Smith & Ingersoll, \(2004\)](#)

⁷ [Ingersoll, \(2012\)](#); [Ingersoll & Strong, \(2011\)](#); [Schmidt et al., \(2017\)](#)

and this “...makes it difficult to disentangle which specific elements, if any, are independently efficacious” (p. 3). [Keese et al. \(2022\)](#) conducted a meta-analysis on research of teacher induction and mentoring programs published from 2010 to 2019. Across 17 studies, they concluded that the “[o]verall effect size was small, but positive and statistically significant” (p. 11).

Additional research has gone beyond the simple question of effectiveness and has examined specific aspects of comprehensive teacher induction programs. [Reeves, Hamilton & Onder \(2022\)](#) analyzed data from the 2018 Teaching and Learning International Survey (TALIS) “to examine relationships between various forms of teacher induction and teacher practices, self-efficacy, and job satisfaction, while controlling for an array of teacher socio-demographic and professional characteristics” (p. 1). They found that five induction practices were correlated with one or more outcomes. Specifically, online or virtual communities had a positive effect on job satisfaction. Teachers who constructed portfolios, diaries or journals had higher self-efficacy, as did teachers who participated in online courses and who had a reduced teaching load. Team teaching was positively related to more favorable teaching practices. These five induction practices, however, were the least commonly available among the teachers in the sample.

Thus, there is considerable research examining the effectiveness of teacher induction programs. There is much less scholarship on the financial considerations around teacher induction programs. We need more scholarship using economic evaluation in education, particularly around efforts to improve teacher retention, including, but not limited to, teacher induction programs. School districts, too, can do their own economic evaluations of these efforts. This report and toolkit are an attempt to provide decision makers with the tools necessary to understand the mechanics of economic evaluation, and templates for doing such evaluations specifically on teacher induction programs.

ECONOMIC EVALUATION IN EDUCATION

For any publicly funded endeavor, there needs to be consideration of the amount of funds allocated and the degree to which those funds are appropriate given desired outcomes. These are political and societal questions about efficiency, and this is where systematic economic evaluation comes into play. “Through a systematic assessment of both costs and consequences, economic evaluation helps compare the feasibility, scalability, sustainability, and equity of program alternatives to help optimize the impact of invested resources.”⁸

⁸ [Peterson & Skolits, \(2020\), p. 1](#)

Economic evaluations have been done for many educational interventions, including class size reduction⁹, preschool programs¹⁰, Social and Emotional Learning (SEL)¹¹, the Talent Search TRIO program¹², and instructional support teams¹³. Levin et al. (2018) explain that there are different types of economic evaluations in education. Although often confused, each is unique and addresses different questions. Table 1 below describes the questions answered by each type of analysis, along with the associated measures of costs and outcomes and the strengths and weaknesses of each approach.

For education, Levin et al. (2018) write about the two most commonly used forms of economic evaluation, cost-effectiveness (CE) and benefit-cost (BC) analysis:

CE analysis should be a topic of concern because it can lead to a more efficient use of educational resources—it can reduce the costs of reaching particular objectives, and it can expand what can be accomplished for any particular budget or other resource constraint. Similarly, BC analysis can identify which investments make the most sense and how much society should invest in education. (p. 5)

All of the types of analyses described in the table involve the calculation of costs. And, there are real advantages to doing simple cost analysis. But, cost analysis does not and cannot establish the relative worth of various resources or the most efficient among alternative programs. That said, too frequently, “...either costs or effects are considered separately, and any combined inferences may be misleading¹⁴”. In a school district, it is common for evaluators to study the effectiveness of a given program, often by looking at the impact on academic performance. Meanwhile, school business officials look mostly at costs and budgets. These two groups of officials can come together “... to attain maximal school effectiveness for a given budget, or conversely... to attain a given level of effectiveness at a minimal cost. They are unlikely to accomplish this goal if higher effectiveness and lower costs are pursued as independent goals.”¹⁵

⁹ Brewer et al., (1999)

¹⁰ Barnett,, (1996); Barnett & Masse, (2007)

¹¹ Belfield et al., (2015)

¹² Bowden & Belfield, (2015)

¹³ Hartman & Fay, (1996)

¹⁴ Levin et al., (2018), p. 6

¹⁵ Levin et al., (2018), p. 6

Table 1. Types of Economic Evaluation (SOURCE: Levin et al., 2018)

Type of Analysis	Analytical Question(s)	Measure of Cost	Measure of Outcomes	Strengths of Approach	Weaknesses of Approach
Cost Analysis	<ul style="list-style-type: none"> • What is the full resource cost of each alternative? 	Total social value of all resources	None	<ul style="list-style-type: none"> • Describes all resources used for each alternative, regardless of who pays for them 	<ul style="list-style-type: none"> • Cannot establish if each alternative is worth that resource use or which alternative is most efficient
Cost-feasibility	<ul style="list-style-type: none"> • Can a single alternative be carried out within the existing budget? 	Monetary value of resources	None	<ul style="list-style-type: none"> • Permits alternatives that are not feasible to be immediately ruled out, before evaluating outcomes 	<ul style="list-style-type: none"> • Cannot judge overall worth of project, because it does not incorporate outcome measures
Cost-effectiveness	<ul style="list-style-type: none"> • Which alternative yields a given level of effectiveness for a given educational goal for the lowest cost (or highest level of effectiveness for a given cost)? 	Monetary value of resources	Units of effectiveness	<ul style="list-style-type: none"> • Easy to incorporate standard evaluations of effectiveness • Useful for alternatives with a single objective or a small number of objectives 	<ul style="list-style-type: none"> • Difficult to interpret results when there are multiple measures of effectiveness • Cannot judge overall worth of a single alternative; only useful for comparing two or more alternatives
Cost-utility	<ul style="list-style-type: none"> • Which alternative yields a given level of utility at the lowest cost (or the highest level of utility at a given cost)? 	Monetary value of resources	Units of utility	<ul style="list-style-type: none"> • Incorporates individual preferences of stakeholders with units of effectiveness • Can incorporate multiple measures of effectiveness into a single measure of utility • Promotes stakeholder participation in decisions 	<ul style="list-style-type: none"> • Sometimes difficult to arrive at consistent and accurate measures of individual or group preferences • Cannot judge overall worth of a single alternative; only useful for comparing alternatives
Benefit-cost	<ul style="list-style-type: none"> • Which alternative yields a given level of benefits for the lowest cost (or the highest level of benefits for a given cost)? • Are the benefits of a single alternative larger than its costs? 	Monetary value of resources	Monetary value of outcomes	<ul style="list-style-type: none"> • Can be used to judge absolute worth of a project • Can compare BC results across a wide variety of projects in education or other areas (e.g., health, infrastructure) 	<ul style="list-style-type: none"> • Often difficult to place monetary values on all relevant educational benefits

There has been much scholarship that attempts to estimate the financial costs of teacher turnover, generally. The National Commission on Teaching & America's Future¹⁶ estimated that nationally, \$7.34 billion are spent each year replacing teachers. They concluded that in urban districts, on average, individual schools spend \$70,000 per year on costs associated with turnover. That study, and others, look only at costs; full economic evaluations that consider both costs and benefits of efforts around teacher retention are rare though necessary.

There has been one attempt to economically evaluate teacher induction programs. Villar & Strong (2007) looked specifically at teacher mentoring programs, which are potentially only one part of a broader or more comprehensive effort at supporting new teachers. They concluded that “[o]verall, the benefit-cost analysis showed that, after five years, an investment of one dollar produces a positive return to society, the school district, the teachers, and the students, and the state almost recovers its expenses” (p. 1).

We do not have to wait for formal, independent, peer-reviewed economic evaluations of teacher induction programs; educational stakeholders can do this work that is local and contextual. This report is part of a toolkit that school divisions can use to approach economic evaluations of teacher induction programs. It affords decision makers an opportunity to examine the costs associated with teacher induction efforts as well as ways they might go about examining effectiveness, benefits or utility of those programs.

Any approach to economic evaluation in education begins with an understanding of the costs associated with any initiative or program. That is the focus of the next subsection.

Inputs/Ingredients

In economic evaluation, the costs are represented by all of the resources or ingredients required to replicate the program, no matter how they were financed or provided. Virtually all resources have a cost, even if they were provided in kind. Furthermore, when conducting economic evaluation in education, Levin et al (2018) emphasize the need to think in terms of opportunity costs, or the value of the resources used to implement the program being evaluated. Accordingly, the “cost” of pursuing the intervention is what we must give up by not using these resources in some other way¹⁷.

Costs should also be distinguished from what is included in a budget. A school district might have a budget for a particular program, but those budgets often do not include all of

¹⁶ Barnes et al., (2007)

¹⁷ Levin et al, (2018)

the costs. Facilities costs are a good example of this. The implementation of a program might require meetings. Those meetings require a meeting space. Typically, especially if the meeting space is district-owned or operated, the cost of those spaces are not included in the budget. But, those spaces could be used for something else; therefore, there are opportunity costs to consider.

Adding the economic principle of cost accounting to the idea of opportunity costs, the best way to estimate the costs of an educational intervention is referred to as the ingredients method. There are typically three steps involved in the ingredients method:

1. Identify and specify ingredients
2. Valuing and pricing ingredients
3. Calculating total cost and analyzing costs in such a way that the cost results relate to the theory of change for the relevant intervention

Once these steps are completed, the costs can be connected to benefits to do a full-scale CE or BC analysis.

The remainder of this subsection of the report is the result of extensive review of the literature on teacher induction programs as well as data collected from human resource practitioners in local school divisions. The literature guided the framing of categories of teacher induction activities; those categories can be used to drill down into specific “ingredients.”. Additionally, in the Spring of 2021, we interviewed key stakeholders in three MERC divisions to gain a sense of how the divisions approached teacher induction. We developed an interview protocol partly based on a protocol designed by the Center for Benefit-Cost Studies of Education (CBSCE) at Teachers College, Columbia University. Before administering the interviews with MERC divisions, the protocol was pilot tested with two school divisions outside of the MERC partners to ensure that we would best get the information we needed about teacher induction programs via the interview. In each interview, at least two members of the research team were present with one or two division-level leaders who were identified as most likely to best be able to answer the questions. In all cases, those leaders were human resource professionals in the divisions.

All interviews were conducted via the Zoom video conferencing platform due to the Covid-19 pandemic. And, the pandemic presented another challenge in that we were asking questions about induction practices that had, for the most part, changed considerably for the 2020-21 school year. School divisions had to adjust for pandemic-related reasons and conducted many of the activities remotely. Thus, our interview questions were specifically aimed at getting a general understanding of teacher induction practices under “normal” circumstances and irrespective of modality.

Using the information in the literature and the data collected via interviews, the remainder of this subsection includes an explanation of how to categorize and document the ingredients of teacher induction programs. This begins with looking at best practices in teacher induction generally as well as what is done at the state level and in three MERC school divisions. The subsection concludes by turning the general practices into a set of categories of ingredients.

The “Ingredients” of Teacher Induction Programs, Generally

The first step in applying the ingredients method is to identify and specify the ingredients of the intervention, program, or reform needed to replicate the implementation (and hence the impact). Accordingly, the ingredients method starts with a simple question: What resources are required to obtain the observed impacts¹⁸? In other words, before enumerating the ingredients involved in teacher induction programs, we need to delineate the scope of the program(s). This is more complicated than one might think because many things that schools and school leaders do are at least in part aimed at supporting new teachers, even if not formally labeled a teacher induction effort. For example, a building principal might come across an article about tips for new teachers and share that article with the new teachers in the building. This is simply information sharing and good leadership practice, but likely not formally considered a part of a district-wide induction program.

Additionally, school districts go about teacher induction in different ways, and numerous organizations have attempted to articulate what makes for good teacher induction. [Carver-Thomas and Darling-Hammond’s \(2017\)](#) report on teacher turnover states that “high-quality induction programs that reduce attrition include mentoring with observation and feedback, time for collaborative planning with colleagues, a reduced teaching load, and a focus on high-leverage activities— such as analyzing student work and discussing instructional strategies” (p. vii). In a 2020 policy brief titled [Supporting Teacher Induction and Mentoring Programs in Light of COVID-19](#), the National Education Association (NEA), citing a 2019 policy brief, laid out the following seven components of a comprehensive induction program:

1. New Educator Orientation Week at the beginning of the school year
2. Mentoring by qualified and trained teacher mentors during the first two years of teaching

¹⁸ Levin et al., (2018)

3. Support teams (i.e., grade level and department colleagues, staff development teachers, and consulting teachers) that meet once a week in addition to formal mentoring by a mentor
4. Courses and workshops for beginning teachers from school district central office on relevant topics
5. Continuous training for mentors throughout their coaching career
6. Training for principals on how to support beginning educators and mentor
7. Evaluation process that focuses on developing teaching skills and professional knowledge

Each of those components can be supported by research and evidence of best practice, but, combined, they present a good, high-level overview of what a coherent and comprehensive teacher induction program looks like. To do any kind of cost accounting, though, these components would need to be broken down into more specifics or “ingredients.”

The “Ingredients” of Teacher Induction Programs, Virginia

Rather than sending new teachers off to their first classrooms to “figure it out on their own,” teacher induction programs have become mandated by state and local level educational policies throughout the United States. In Virginia, at the state level, the focus has been almost entirely on mentoring, which is only one possible component of a comprehensive teacher induction program. Since 1989, pursuant to § 22.1-305.1 of the state code:

The Board of Education shall establish, from such funds as may be appropriated by the General Assembly, mentor teacher programs utilizing specially trained public school teachers as mentors to provide assistance and professional support to teachers entering the profession and to improve the performance of experienced teachers who are not performing at an acceptable level.

Also by virtue of that statute, the Virginia Board of Education was to issue guidelines for teacher mentoring programs that then must be implemented and administered by each school division. In September 2021, [the Board of Education issued the latest such guidelines](#). Those guidelines recognize that “[a] mentoring program should be part of a larger system of teacher development, support, accountability, and evaluation” (p. 3). The guidelines include detailed elements, but they largely leave much of the authority and decisions at the level of the school division. Furthermore, school divisions must use their own resources. “The local school board consistently allocates sufficient resources to enable

the Mentor Teacher Program to meet all requirements and deliver planned components to all beginning teachers consistent with the stated program vision, mission, goals, and design” (p. 9).

In addition to what each school division offers pursuant to state law, there are statewide collaborations that offer new teacher supports. [Reach Virginia](#), formerly known as the Teacher Induction Network, is hosted by the Loudoun Education Association and currently supports new teacher mentoring programs across 23 Northern Virginia school divisions. Additionally, in 2020, the Virginia Department of Education, in partnership with James Madison University and Virginia State University, launched the [Virginia New Teacher Support Program \(VANTSP\)](#). The initial goal was for VANTSP to provide mentoring and professional development to 500 teachers.

The “Ingredients” of Teacher Induction Programs, Locally

To this point, the literature on what constitutes a comprehensive teacher induction program has been summarized. And, it has been noted that, as described above, in Virginia, each school division is required to at least provide a mentoring program for new teachers. Beyond that mentoring program, it is up to each individual school division to decide how they want to formally and informally support new teachers. As a result, teacher induction programs can look very different from one division to the next. To develop a set of categories of teacher induction programs into which the “ingredients” can be placed and costs determined, then, we can look to the practices of local school divisions.

As mentioned above, extensive interviews were conducted with school division officials. Based on the interviews, teacher induction efforts in the divisions can be grouped into five activity categories: orientation, mentoring, observation, professional development, and anything additional. In total, across the three divisions, the activity categories are similar to the model or comprehensive program described by the National Education Association above. However, not all of the divisions incorporated all of the elements and each took slightly different approaches to the same category of activities. For example, while all three divisions had mentoring programs, how those were designed varied across school divisions.

Orientation

All three divisions reported holding some kind of orientation event for new teachers. Goochland runs a New Teacher Academy (NTA) which takes place over the course of a week and includes brand new teachers and teachers new to the division. Henrico has a ½ day HR orientation for new teachers and Kickoff Week for brand new teachers and teachers new to the division. Throughout Kickoff Week, there are specified pathways for new teachers

based on a number of factors including grade level, discipline, etc. Chesterfield takes a similar approach as part of its broader New Teachers Induction Program (NTIP).

Mentoring

Consistent with state law requiring mentoring of new teachers, all of the MERC divisions interviewed reported having comprehensive mentoring programs for new teachers. Chesterfield reported that each teacher is assigned a mentor and those mentors do most of the heavy lifting, including meeting monthly with their mentee and documenting growth and areas for improvement. Mentors are compensated and that varies from year-to-year (somewhere between \$75 and \$100 at the time of the interview). Goochland reported that mentors also received a stipend. Henrico reported taking a similar approach to mentoring, and mentors can have up to three mentees at any given time (though they try to keep it at 1:1). Mentors receive training in advance to support their work as a mentor, and are expected to meet weekly with their mentee.

For teachers who are not new to the profession, but who have less than five years as a teacher and are new to the county, Chesterfield reports assigning a “colleague.” Colleagues do similar work as a mentor. Chesterfield and Henrico also reported using a “buddy” system for teachers who are not new to the profession, but who are new to the division. Buddies and their mentees are invited to all mentoring programming, though expectations for that relationship are generally a bit lower. The work of the buddy is not quite as intensive as that of a mentor; they are less instructionally focused and more of a support around division-specific policies and procedures.

Observation

All three divisions reported that new teachers get specialized observation protocols. In Chesterfield, for example, the mentors do a once-per-semester observation in both directions. In Goochland, new teachers get more classroom observations than veteran teachers.

Professional Development / Workshops

Finally, all three districts provide specialized professional development for new teachers. In all three districts, school-based or district-based mentor-coordinators coordinate this regular programming for mentors and mentees. The mentor-coordinators in Chesterfield serve on school leadership teams and work with an AP in the building; they are also mentors to one teacher. In Henrico, the monthly meetings organized by the mentor-coordinators involve lesson plans developed on various topics to support new teachers. In Goochland, these teacher induction programs or workshops coordinated by

the mentor coordinators are held quarterly. There are other ad hoc professional development opportunities made available to new teachers in the school divisions as well.

Utility/Effectiveness/Benefits

The previous section of this report focused on inputs or “ingredients” which is information that can be turned into cost data (see subsequent sections). And, cost data allow administrators and stakeholders to examine the finances of any given program, including teacher induction programs. Cost analysis is useful on its own; information about costs can reveal a lot about a particular intervention. For example, to even think about costs of a teacher induction program forces educational leaders and stakeholders to examine everything that goes into the program; this sort of investigation can be quite revealing. Maybe the program is more or less extensive than imagined, or maybe it is not as coherent as it needs to be.

Moreover, estimates of costs alone are important for another reason: They are a guide to affordability. CF analysis refers to the method of estimating only the costs of an alternative in order to ascertain whether or not it can even be afforded. If the cost of any alternative exceeds resources that are available, there is no point in doing any further analysis¹⁹.

In other words, per Table 1 above, cost analysis allows for cost-feasibility studies where there is no outcome of interest, but, simply, an assessment of whether the costs exceed available resources. The last three rows of that table, though, show that there are three kinds of economic evaluation that do include outcome measures: cost-effectiveness (CE), cost-utility (CU), and benefit-cost (BC). The remainder of this section looks at three ways to think about outcomes: utility, effectiveness, and benefits.

Utility

Cost-utility analysis is the least frequently used form of economic evaluation in education. It involves the evaluation of alternatives by comparing costs and their **utility (i.e. satisfaction to an individual or group)**. CU analysis includes information on a range of outcomes to assess overall utility or satisfaction. The outcomes are weighted by the preferences of those making decisions (i.e. based on how much the outcomes contribute to overall satisfaction). The challenge with CU analysis, and the reason it is not employed more, is that it is very difficult to find valid ways to determine the relative values of

¹⁹ Levin et al., (2018), p. 10

outcomes, particularly where there is more than one outcome involved. In the simple case above, there is only one outcome: student achievement.

CU analysis could be used to do an economic evaluation of teacher induction programs, though the challenges noted above would certainly apply. There are certainly multiple outcomes relevant to teacher induction programs: new teacher satisfaction, new teacher retention, new teacher value-added assessment scores, etc. One could try to determine appropriate weights for those outcomes by surveying relevant stakeholders and then compute the overall utility and, thus, do the CU analysis. However, ultimately, there is a fair bit of subjectivity built into this kind of analysis.

Effectiveness

Cost-effectiveness (CE) analysis is used when trying **to compare two or more programs**. In the end, CE analysis yields a ratio of the costs to the results **on a quantifiable effectiveness measure**. In education, it is not uncommon to examine the achievement effects of two or more interventions and to compare those outcomes. That is fine, but it does not take into account the relative costs of the interventions the way that a full CE analysis does.

When doing CE analysis, there are many ways to measure effectiveness. “For example, alternative interventions can be evaluated on the basis of their cost for raising student test scores by a given amount, or the cost for each potential dropout averted, or the cost per instance of conduct disorder²⁰.” However, CE analysis can only be conducted if: (1) programs with the same goals are being compared, and (2) there is a common measure of effectiveness that can be used to assess them.

Cost-effectiveness analysis has been used to conduct economic evaluations of numerous educational policies and programs, though to this point, not teacher induction programs. One reason we do not have any cost-effectiveness analyses of teacher induction programs is that, unlike, say, reading comprehension or other academic issues, districts do not usually have more than one teacher induction program that can be compared. If a district were to undergo a comprehensive change to their teacher induction program from one year to the next, they might be able to compare the outcomes relative to costs across the two years. However, it would be unusual to do so as most policy reforms are incremental at best. It may also be possible to compare the cost-effectiveness of teacher induction programs across two or more districts, but that would require establishing a common goal and a common metric of effectiveness that can be used to assess them. Retention of new

²⁰ Levin et al., (2018), p. 13

teachers might be such a metric, but collecting the data across districts would require coordination among districts likely by an external researcher.

Benefits

The specific challenges of doing a full CE analysis of teacher induction programs are why Villar & Strong (2007) conducted a benefit-cost analysis of a comprehensive teacher mentoring program in a medium-sized California school district. Additionally, whereas CE analysis would allow for a determination of whether a given alternative is relatively more cost-effective than other alternatives, it does not tell us whether its total benefits exceed its total costs. This is where benefit-cost (BC) analysis finds its value. BC analysis examines policies or interventions according to the difference between their costs and **a monetized measure of their effects**. In other words, CE analysis uses a straight measure of effectiveness to generate a CE ratio, whereas BC analysis turns the effectiveness measure into a monetary value and compares that to the costs²¹.

Because the outcomes are monetized, BC analysis, unlike CE analysis, can be used to compare programs with different goals or outcomes. It is also a particularly useful tool for doing an economic evaluation of something like teacher induction because teacher induction programs are multi-faceted; they have many parts (and lots of ingredients in cost analysis terms). If, ultimately, the costs of a program exceed the monetized outcome, any number of parts of the program (or ingredients) can be examined for possible reduction.

When examining the benefits of programs, there are two important considerations. First, in monetizing outcomes, the focus should be on **willingness to pay**. Second, all possible benefits should be considered in the analysis. And, those two considerations are related:

The concept of willingness to pay is a powerful one for at least two reasons. First, it does not place undue restrictions on the categories of benefits that we might consider... Thus, the conceptual framework serves as a constant reminder that we should cast the widest possible net when delineating and measuring program benefits. Second, the conceptual framework encompasses the benefits received by every individual who is directly or indirectly affected by the program or alternative under consideration—and not just those who are its immediate targets... The goal is to obtain a broad estimate of the benefits that accrue to program participants as well as to other members of society²²...

²¹ Levin et al., (2018)

²² Levin et al., (2018) p. 196

A CE analysis of teacher induction programs might use new teacher retention as a measure of effectiveness. This is, of course, a proxy measure, as, in the absence of a randomized control trial, there is no real way to know that a teacher induction program causes a new teacher to stay in or leave a district. However, undoubtedly, the main goal of any teacher induction program is to retain- first and/or second-year teachers.

For BC analysis, there are certainly multiple benefits to consider from a willingness to pay perspective. In their analysis of mentoring programs, Villar & Strong (2007) looked at benefits in two categories: “...returns on district investments to training and the lowered social costs of losing new teachers to the teaching profession” (p. 12). The former is further broken down into returns on district investments to training and returns on a culture of professional development.

PUTTING IT ALL TOGETHER: THE TEACHER INDUCTION PROGRAM ECONOMIC EVALUATION TOOLKIT

To improve new teacher retention, schools and districts have developed teacher induction programs. The *Teacher Induction Program Economic Evaluation Toolkit* was developed to help school districts conduct economic evaluations of their teacher induction programs. The Toolkit consists of: this report, a how-to-guide, the [Teacher Induction Program Ingredients Matrix](#) and the [Teacher Induction Program Benefit-Cost Workbook](#). The latter two pieces of the Toolkit are described and discussed below.

The Teacher Induction Program Ingredients Matrix

The [Teacher Induction Program Ingredients Matrix](#) is a useful tool for collecting information and data used on the inputs or ingredients of a teacher induction program. It is intended to be used as a policy planning tool as well as a means for collecting information for the [Teacher Induction Program Benefit-Cost Workbook](#) (described in greater detail below). That is, while collecting information to do an economic evaluation of a teacher induction program, the [Matrix](#) is also a tool that allows educational leaders and stakeholders to take stock of all that goes into their teacher induction efforts.

The development of the [Matrix](#) was multi-phased; it is built based on multiple sources, including the literature on teacher induction programs, interviews with MERC division personnel, and the Villar & Strong (2007) analytical framework. The former two sources are

what yielded the **categories of teacher induction activities** that are built into the [Matrix](#) and the [Workbook](#). In other words, those categories are a distillation of activities typically found in comprehensive teacher induction programs and what interviewed school divisions reported undertaking. Those five activity categories are described in a previous section of this report.

The **cost categories** are largely based on the Villar & Strong (2007) framework, but are also informed by Levin et al.'s (2018) book on economic evaluation in education. For the purposes of a benefit-cost analysis of a comprehensive teacher mentoring program in a medium-sized California school district, Villar & Strong (2007) developed the cost categories depicted in Figure 2 below. The cost categories include: personnel, facilities, equipment & materials, program inputs, and client inputs. Program inputs refer to other expenditures that are integral to the program objectives, such as professional development. Client inputs refer to the contributions that new teachers and principals of new teachers offer in terms of their own time to coordinate and participate in the program. Looking across the ingredients of teacher induction programs generally, at the state level, and, especially locally helps us determine all of the ingredients, and, thus, costs of a teacher induction program. To get from program categories to ingredients, then, requires consideration of all that is involved within each of the categories.

By combining the categories of activities and the categories of costs, the [Matrix](#) is formed. In other words, the 5 induction activity categories are crossed with the 5 cost categories to generate a 5x5 [Matrix](#). (NOTE: The [Workbook](#) (described subsequently) puts the [Matrix](#) into an interactive form and allows for the inputs of estimates of actual costs and benefits which are then automatically fed into the calculation of the benefit-cost ratio based on the principles of Levin et al. (2018).

Table 2 below is a representation of the cost [Matrix](#). The categories of teacher induction program activities are in the rows of the [Matrix](#), and the cost categories are in the columns. For each activity category, administrators and/or stakeholders need to think about ingredients in each of the cells of the [Matrix](#). For example, starting at the top left, which personnel are involved in any new teacher orientation program, and to what degree? Then, moving to the right on that same row, what facilities are used for any new teacher orientation program and what, if any, costs are associated with the use of those facilities?

Again, the [Teacher Induction Program Ingredients Matrix](#) is a useful tool for collecting information and data used on the inputs to a teacher induction program. It is intended to be used as a policy planning tool as well as a means for collection information on ingredients for the [Teacher Induction Program Benefit-Cost Workbook](#)

Table 2. Teacher Induction Program Cost Matrix

	PERSONNEL	FACILITIES	EQUIPMENT/ MATERIALS	PROGRAM INPUTS*	CLIENT INPUTS**
ORIENTATION					
MENTORING					
PROFESSIONAL DEVELOPMENT					
OBSERVATIONS					
ADDITIONAL INPUT CATEGORY					

*Program inputs refer to other expenditures that are integral to the program objectives, such as professional development (see e.g. mileage reimbursement).

**Client inputs refer to the contributions that new teachers and principals of new teachers offer in terms of their own time to coordinate and participate in the program.

The Teacher Induction Program Benefit-Cost Workbook

Workbook Cost Tabs

The majority of the interactive [Workbook](#) consists of tabs for entering cost data which should be generated from information in the [Matrix](#). In fact, it would be good practice to review the [Workbook](#) before working with the [Matrix](#) to know what sorts of data will eventually be needed for the [Workbook](#). There are tabs corresponding to each of the teacher induction program activities (the rows in the [Matrix](#)). And, each tab is broken down into the cost categories (the columns in the [Matrix](#)). The rows in each tab allow for entering specific information under each category. So, for example, under Personnel on the Orientation tab, there are multiple rows because there are likely multiple school and district personnel involved specifically in teacher induction program orientation activities.

Figure 3. Workbook Orientation Tab Example

	A	B	C	D	E
1		FISCAL YEAR 18-19			
2		SALARY	PERCENTAGE OF TIME	TOTAL COST	SALARY
3	PERSONNEL			0	
4	[District Administrator #1]			0	
5	[District Administrator #2]			0	
6	[Consultant / Speaker]			0	
7	[Administrative support]			0	
8	[Other]			0	
9	[Other]			0	
10	[Other]			0	
11	[Other]			0	
12	[Other]			0	
13	[Other]			0	

☰	INSTRUCTION	ORIENTATION ▼	MENTORING	PROFESSIONAL	OBSERVATION	ADDITIONAL II	TOTAL COSTS	BENEFITS	+
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Each tab in the [Workbook](#) also contains space for cost data for multiple school years. Users are free to use the [Workbook](#) to examine costs and/or benefits for any number of years. By default, the [Workbook](#) is set for inputting data for years largely pre-pandemic. Like virtually all other areas of education, teacher induction programs necessarily underwent drastic changes during the pandemic and data and information from those years are likely to be skewed.

Figure 4. Multiple School Years in the Workbook Example

FISCAL YEAR 19-20			FISCAL YEAR 20-21			FISCAL YEAR 21-22		
SALARY	PERCENTAGE OF TIME	TOTAL COST	SALARY	PERCENTAGE OF TIME	TOTAL COST	SALARY	PERCENTAGE OF TIME	TOTAL COST
		0			0			0
		0			0			0
		0			0			0
		0			0			0
		0			0			0
		0			0			0
		0			0			0
		0			0			0
		0			0			0
		0			0			0
		0			0			0
		0			0			0
		0			0			0
		0			0			0

Workbook Benefits Tab

As stated above, there are likely multiple categories of benefits that flow from teacher induction programs. In theory, at least, new teachers become better teachers. Student learning gains should then flow from better teaching. Mentors benefit from teacher induction programs as they gain even more confidence and leadership skills and dispositions, and they contribute to a culture of professional learning that benefits the whole school.

The [Teacher Induction Program Benefit-Cost Workbook](#) leaves room for users to enter estimates of multiple benefits. However, most of those estimates are really hard to generate. How, for example, would we determine an estimate for the student achievement gains attributable to teacher induction programs? Similarly, how do we estimate the value of the culture of professional learning that may flow from a coherent teacher induction program?

The first version of the [Workbook](#), therefore, focuses on new teacher retention as the primary benefit. Even here, though, new teacher retention data would have to be given a monetary value to be included in a full benefit-cost analysis. The question, essentially, is “**how much does it cost when a new teacher leaves?**” A number of studies have attempted to devise methods for estimating the costs of teacher turnover. The literature tells us that costs vary depending on factors such as the size of the district, the position(s) to be filled, geographic location, etc. In 2007, [Barnes, Crowe & Schaeffer](#) studied five school districts and found vast differences:

In Granville County, North Carolina, the cost of each teacher who left the district was just under \$10,000. In a small rural district such as Jemez Valley, New Mexico, the cost per teacher leaver is \$4,366. In Milwaukee, the average cost per teacher leaver was \$15,325. In a very large district like Chicago, the average cost was \$17,872 per leaver (pp. 4-5).

More recently, [DeFeo et al. \(2017\)](#) used data collected from administrators in 37 of Alaska’s 54 districts and concluded that the total average cost of teacher turnover is \$20,431.08 per teacher in that state.

To help districts and stakeholders estimate costs of teacher turnover, The Learning Policy Institute created a [Teacher Turnover Cost Calculator](#) that takes into account various factors. The estimates built into the calculator are derived from averages across several studies²³; [Milanowski, A., & Odden, A. \(2007\)](#) and are adjusted for inflation. The Calculator is intended to generate approximate plausible values to help districts and stakeholders to understand the costs of teacher turnover in their own contexts.

By default the Calculator estimates that the cost to a rural district of teacher turnover is \$9,000 per teacher. In a suburban district, that estimate goes up to \$11,000 per teacher, and in an urban district, the estimated cost is \$21,000 per teacher. The cost estimates can be adjusted in the Calculator. Along with the Calculator, the Learning Policy Institute (LPI)

²³ Shockley et al. (2006); [Barnes et al., \(2007\)](#).

provides a [list of activities that are often associated with replacing a teacher](#), all of which have related financial and personnel costs. By considering that list of activities, local school administrators can adjust the cost estimates in the calculator.

To figure out the benefits, that is to monetize the value of teacher turnover, the LPI Teacher Turnover Cost Calculator is built into the [Teacher Induction Program Benefit-Cost Workbook](#), in the penultimate tab. To use the Calculator, a school division needs to know either the number of teachers who left or the total number of teachers in the school division and the percentage of teachers who left. To use the Teacher Induction Program Cost [Workbook](#) to conduct a BC analysis of the teacher induction program, the division needs to know the number of new teachers that left or the percentage of new teachers that left.

It may seem odd to use estimates of the *costs* of new teacher turnover as estimates of the benefits of a teacher induction program. However, it is important to remember that, as mentioned earlier in this report, for the purposes of benefit-cost analysis, benefits are to be monetized under the conceptual framework of “willingness to pay.” If the main goal of teacher induction programs is to retain new teachers, any school division should be willing to pay what it would cost to have to replace new teachers who leave. Villar & Strong (2007) refer to the benefit as **“savings from reduced attrition.”**

To calculate savings from reduced attrition, Villar & Strong (2007) use a reference point to determine how beneficial the teacher induction program was. To do that, they pose a counterfactual question: “What would the attrition rate of new teachers be in the absence of the induction program?” (p. 9). Furthermore, they add, “Ideally, in order to address this question, either we would need to know something about past attrition rates, or we could compare the target group with a comparison group that does not receive the intervention” (p. 9). However, since the program was not newly developed nor was it only offered to some randomly selected group of new teachers, those were not feasible comparison rates. Therefore, instead of using those data, they use statewide attrition rates as the baseline to determine that, on average, teacher attrition in the district under study was about 2% better than the state average.

On the Benefits tab of the [Workbook](#), users are asked to input two sets of numbers and to use the LPI Calculator to estimate two sets of costs. The first set of numbers are the actual number of NEW teachers hired in a given year and the number of those NEW teachers that returned to the district the next year. The LPI Calculator will use those numbers to generate an estimated cost of turnover. Additionally, users need to calculate the costs of a hypothetical attrition rate. That is, they are asked to estimate a response to the question of “What would the attrition rate of new teachers be in the absence of the induction

program?” Users might choose to input a rate based upon any of the following possibilities: statewide rate, rate of similar district(s), rate anticipated prior to the year, previous year’s rate, etc. In a district that has higher attrition rates than, say, the state average and also similarly situated districts, the best path forward may be to simply guess at what the attrition rate of new teachers would have been in the total absence of a teacher induction program.

The benefit of the teacher induction program is then automatically calculated as the difference between the hypothetical estimated cost of turnover and the estimated cost of turnover based on actual turnover data. Again, this seems like cost data, but it is actually an estimate of the willingness to pay for the induction program; it is the savings from reduced attrition and is, therefore, the estimated benefit of the program.

Benefits-Cost Analysis Tab

The Benefits-Cost Analysis tab of the [Workbook](#) is where the data from the cost tabs and the benefits tab come together automatically to produce a benefits-cost ratio. Ideally, that ratio is greater than one. That is, we want to know that the benefits attributable to the teacher induction program are greater than the attributable costs. Villar & Strong’s (2007) benefit-cost analysis of the mentoring program yielded a benefit-cost ratio of 1.66. In other words, as they wrote, “Assuming the costs of hiring a replacement represent 50% of a new teacher’s salary, an investment in an intensive model of new teacher induction in a given district pays \$1.66 for every \$1 spent” (p. 16). That is evidence of a beneficial program considering both costs and benefits.

If the benefit-cost ratio is less than one, administrators and stakeholders might want to consider that they have overestimated costs or underestimated benefits. Savings from reduced attrition are certainly not the only benefits of teacher induction. In fact, Villar & Strong (2007) concluded that “[s]avings from new teacher attrition amount to only 17% of the total benefits the program yields.” Thus, divisions using the [Workbook](#) may want to consider entering estimates for “Other Benefits” on the Benefits tab. Alternately, if after serious deliberation and consideration, it may be that costs need to be lowered. Then again, that same deliberation and consideration may lead administrators and stakeholders to conclude that additional inputs (and their associated costs) might boost retention higher at a greater relative weight. That is, there may be additional costs to incur that would ultimately prove so beneficial from a retention perspective, that the division would be willing to pay those costs moving forward.

LIMITATIONS AND CONCLUSION

Teacher induction programs are not the only reason new teachers stay or leave a school or division. And, new teacher turnover rates are not a direct measure of the success of teacher induction programs. However, at a time when school finances remain tight and when the teacher labor market is so volatile, engaging in economic evaluation of teacher retention efforts such as teacher induction programs is a good idea. This report and the associated tools, including the [Teacher Induction Program Ingredients Matrix](#) and the [Teacher Induction Program Cost Workbook](#), are designed for school divisions to conduct a rough economic evaluation of their teacher induction programs. If nothing else, using the tools and conducting the analysis should generate useful discussions about the comprehensiveness and coherence of teacher induction programs. Used in totality, then, school divisions should gain a fuller understanding of the costs and benefits of various aspects of their teacher induction program as well as the program as a whole.

The initial version of the [Teacher Induction Program Cost Workbook](#) is just that, initial. Future versions of the [Workbook](#) could include any number of improvements or updates. One notable limitation of the [Workbook](#) is that if it is used to estimate costs that extend over 2 or more years, the analysis should consider inflation and discounting²⁴. Adjusting for inflation means pegging price levels of ingredients to a single year. Levin et al. (2018) add that “...even for a single year program, if the prices used for ingredient valuation come from different sources, they may also need to be adjusted so that all prices are expressed in terms of the same year” (p. 94). Costs should also be discounted; that is, adjusted for their time value. “The basic idea is that costs occurring in the future are less of a burden than costs occurring in the present. Thus, we need to discount future costs to properly compare them with present costs²⁵.” The initial version of the [Workbook](#) does not account for inflation and does no discounting.

[E\\$imator](#) is a [web-based tool](#) developed by researchers at Teachers College, Columbia University that is freely available and that allows users to do economic evaluations. That tool will do discounting and account for inflation, but it is not specific to teacher induction programs. Additionally, [the Cost Analysis in Practice \(CAP\) Project](#), also housed at Teachers College, Columbia University, provides interactive EXCEL templates to do single- and multi-year cost analyses. They also have a template for cost-effectiveness studies, but do not have one currently for benefit-cost analysis.

²⁴ Levin et al., (2018)

²⁵ Levin et al., (2018), p. 96

Limitations notwithstanding, this report, in combination with the [Teacher Induction Program Ingredients Matrix](#) and the [Teacher Induction Program Benefit-Cost Workbook](#), is designed to allow school district leaders to conduct an economic evaluation of their teacher induction program. It affords decision makers an opportunity to examine the costs associated with teacher induction efforts as well as ways they might go about examining effectiveness, benefits or utility of those programs. The whole toolkit is offered as an opportunity to engage in a number of activities ranging from just using it to have conversations about teacher induction program inputs to conducting a full-scale economic evaluation of a teacher induction program.

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