

The Use of Technology-Based Learning for Basic Skills in Job Corps

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Executive Summary

Educational technologies have long held promise to facilitate learning for students at all levels and stages of their education. Recognizing this potential for technology to transform learning, the Office of Educational Technology “sets a vision and plan for learning enabled by technology” in its National Education Technology Plan (Office of Educational Technology, 2017). To understand its effects on learning, researchers have extensively analyzed and evaluated instruction via educational technologies (Escueta et al., 2017; Means et al., 2009). However, the existing literature has focused primarily on the role of technology in traditional K-12 or higher education settings. Less attention has been given to the role of technology specifically in the context of workforce development and nontraditional education. To begin to address this research gap, the U.S. Department of Labor (DOL) Employment and Training Administration (ETA) has been actively exploring the viability and effectiveness of learning via educational technology, or Technology-Based Learning (TBL), in the public workforce system.

For the purposes of this study, DOL has chosen to explore the use of TBL in the context of the Job Corps program, a residential academic and vocational training program that offers an intensive set of services and supports to some of the most disadvantaged youth served by the workforce system. Over time, educational technologies have been incorporated into Job Corps to support a variety of its education and training components. The present study focuses on the use of TBL specifically in the context of academic remediation in reading and math, also referred to as basic education skills. These findings will provide the most comprehensive description to date on the use of TBL in Job Corps, and the results will inform future efforts to expand the use of TBL for remediation throughout the Job Corps center network.

Job Corps students typically enter the program with significant deficiencies in reading and math skills. Remediation of these deficiencies is an important step in the process of preparing students to pursue occupational training and improve their employability and capacity for self-sufficiency. Given the complex instructional environment in which the Job Corps program operates, TBL resources and strategies offer an innovative approach to supporting academic remediation. In this report, we systematically document and analyze the use of TBL across the entire network of Job Corps centers, reporting on the process by which TBL has been selected, the challenges faced during implementation, and those best practices for TBL identified by the instructors, managers, and directors. The data collected for this study come from three sources: 1) a web-based survey administered to every Job Corps center around the country, 2) semi-structured interviews with Job Corps center staff at seven sites, and 3) focus groups conducted with students at those same seven sites.¹

Summary of findings

Our analysis is organized around several research questions specified by the Department of Labor. We summarize the findings as they pertain to each topic here:

To what extent have Job Corps centers implemented or planned for TBL for remediation: Most Job Corps centers are currently using TBL resources in some capacity in the context of remedial education.

¹ Staff invited to interviews included center directors, deputy center directors, academic managers, and instructors. Throughout the report, we use the generic term “staff” to cover all types of center employees. The term “administrators” is used to discuss center directors, deputy directors, and academic managers. The term “leadership” refers to either the center director or a deputy center director.

Of our 115 survey respondents, 99 (86%) report that they currently use TBL for remediation, and most centers also rely on TBL to deliver instruction in other areas, such as high school academics or English as a second language (ESL).² Ten percent of centers have never used TBL resources for academic remediation, and four percent do not currently use TBL for remediation but have done so in the past.

The majority of centers (64%) also report that they have some plan to expand their use of TBL for the purposes of academic remediation, but in many instances these are informally stated intentions. It's unclear to what extent these plans have been fully developed or prepared for implementation.

What factors do centers consider when selecting TBL resources: The TBL selection and decision-making process is typically handled internally at the center, driven by either the preferences of the academic manager or a “bottom-up” process based on instructors’ preferences. Among centers that are managed by a common operating firm, the selection process is sometimes driven by efforts to share best practices among sibling centers.³

When considering different factors that inform the selection of a TBL software resource, most centers that currently use TBL resources cite two factors in particular, cost (68%) and compatibility with existing technology infrastructure (60%), suggesting that center’s main concerns involve the financial or logistical feasibility of acquiring or implementing a given resource. Other factors include perceptions of the student’s ability to use the resource, which centers consider more important than an instructors’ ability to use the resource. Also, about 40% of centers consider a resource’s demonstrated effectiveness and its alignment with students’ skill levels – both of which relate to a resource’s suitability for use in remedial education – as top factors for consideration. However, all of these other factors are of secondary importance relative to the cost and compatibility issues cited above.

What TBL resources and strategies are currently in use for remediation: The use of TBL for remediation is widespread across Job Corps centers (86 percent). Reflecting the flexibility with which centers are permitted to operate, the list of software resources currently in use is quite diverse, and centers’ approaches to implementation vary. Over 20 different TBL software programs are currently in use for remediation across the network of centers. Interestingly, only one software program is currently in use at a majority of those centers: Khan Academy. No other program is in use at more than 30 percent of centers, and ten other programs are currently used by at least five percent of current-use centers. The top five programs currently in use offer students the opportunity to independently complete computer-based lessons and exercises in a self-paced environment.

How satisfied are center directors and managers with the effectiveness of TBL: Based on our survey results, centers that currently use TBL for remediation tend to find that it is either as effective as or more effective than traditional instructional methods. About forty percent find TBL strategies more effective, while about half found them equally as effective as traditional instruction. Only ten percent of current users of TBL report that they find it less effective. When asked during site visits, center staff usually report that they look for improved Tests of Adult Basic Education (TABE) scores to determine a given TBL resource’s effectiveness.

² The survey’s response rate was 92 percent.

³ Job Corps centers are typically operated by private firms under contract with DOL. A subset of centers is operated by the U.S. Department of Agriculture’s Forest Service.

How do instructors and students perceive TBL instructional resources: Staff and students shared mixed opinions of TBL resources when interviewed during the study team’s site visits, but most opinions of TBL were positive. Instructors appreciate the extent to which some TBL resources can facilitate personalized instruction and allow for flexibility in the classroom to provide one-on-one attention to students in need of instructional assistance. Likewise, many students find that TBL can be more engaging, particularly when it involves more competitive learning games, and allows them to work at their own pace. For students who are motivated to pass their TABE requirements and concentrate on their career and technical education, they report that TBL instruction may enable them to finish quicker than they would otherwise in a traditional classroom environment. Still, at each center, at least one student reported that they preferred traditional classroom environments, often because they felt that TBL instruction was isolating and unfamiliar. Also, many students report a general dissatisfaction with the quality and availability of technology resources on center. During our site visits, staff at four centers also reported some dissatisfaction with the quality of personal computers, SMART Boards, and available software.

To what extent do technological literacy and other barriers pose a challenge to TBL use: Staff and students may face several barriers to implementation of TBL resources. Some barriers are generally applicable to everyone, while others may be important to a smaller share of individuals for whom the barrier poses a significant challenge. Of particular concern to the Job Corps National Office are those challenges associated with instructors and students’ technological literacy, meaning their capacity to effectively utilize TBL resources. While the survey results suggest centers typically perceive that technological literacy is, at worst, a minimal barrier for students and instructors, about 15-20% of centers report that technological literacy among staff or students poses a significant challenge to expansion of TBL resources.

Despite any struggles with using technology for education, centers report that instructors and students are generally willing to make use of TBL resources. Still, during site visit interviews and focus groups, some instructors and students report that a lack of reliability and stability of IT systems (as discussed further in the next section) on center affects their willingness to use those resources. Also, to the extent that students are more easily distracted in a TBL environment, some instructors are resistant to expanded use of technology for learning, particularly for independent, asynchronous study.

To what extent do centers have the capacity to implement TBL resources: Considerably more challenging than these student- or instructor-specific issues are the institutional and capacity challenges facing many centers. Most report significant barriers associated with the cost to purchase equipment, security requirements associated with using software, reliability of internet connectivity and bandwidth, and compatibility between existing hardware and software resources. Staff often point to non-working computers and SMART Boards as examples of existing hardware that are not being used to their full capacity. Instructors often wish that they had easier access to certain websites, namely YouTube, in order to show instructional videos in class. Among centers that face significant challenges to managing their IT infrastructure, leadership often appreciate the presence of a designated IT support staff person.

Challenges and recommendations

We identified several challenges to the expanded use of TBL in Job Corps. To some extent, these challenges are not unique to the Job Corps experience. Therefore, where appropriate, we draw on related research and analyses to identify potential lessons and recommendations that may help the Job Corps program address these challenges.

Diverse skills and backgrounds of incoming students: At the outset, we note that a fundamental challenge to remedial instruction in Job Corps stems from the fact that students enter the program on a rolling basis and with a diverse set of skills and educational backgrounds. In response to these kinds of educational settings, researchers and practitioners often explore various options to differentiate and adapt instruction to students' needs (Bill and Melinda Gates Foundation, 2006; Vaughn et al., 2016).

To the extent that a TBL program can adapt its content and even instructional approach in response to student needs, TBL programs may be able to differentiate instruction among students relatively easily. Existing programs often include initial assessments of students' skills and prior knowledge so as to identify those instructional areas in which students need the most remediation and tailor the coursework to those needs. In a comprehensive assessment of literacy and numeracy skills of a sample of Job Corps students, a team of researchers subjected students to a full battery of seven different assessments, each intended to measure a different aspect of literacy and numeracy (Mellard et al., 2012). The researchers found that Job Corps students struggled most with reading fluency, functional literacy, and functional numeracy. Any TBL resource intended to differentiate instruction ought to include some form of skills assessment and clearly identify the literacy and numeracy concepts measured.

Capacity to acquire and implement TBL resources: Centers report significant challenges associated with their financial and logistical capacity to implement or expand the use of TBL for remediation. Addressing this challenge may require that centers have access to additional flexibility to acquire TBL resources. Centers could also make better use of existing technology capacity by ensuring they have adequate information technology (IT) support on center. As discussed in Chapter 7, centers that maintain a dedicated IT support person on staff report that they value that position. In some centers, administrative and instructional staff spend a portion of their time in this role, but they also report having insufficient time to fulfill the IT support role.

Ability to share best practices: In several site visit interviews, center leadership either expressed a desire to learn more about what other Job Centers use with regard to TBL resources. Additionally, centers that are run by an operator that manages several centers report an appreciation for sharing best practices among their sibling centers. Given the extent to which TBL implementation varies across the center network, centers may benefit from sharing best practices. These could include instructional approaches that seem most effective or cost-effective strategies for including more TBL for remediation or other purposes. There are over 20 different TBL programs in use for remediation across the country. While this report captures detailed center-specific experience with TBL, an ongoing community of practice may allow for continued sharing of ideas and experiences, such as the role of IT support staff or a list of trusted TBL resources that are freely available over the internet or not too costly.

Maintaining student engagement: Students may find certain TBL environments unengaging, leaving them more susceptible to distraction. In an effort to make TBL resources more appealing to students and thereby facilitate more learning, instructional designers have often turned to “gamification” of instruction, which entails using game-like elements in non-game educational contexts (Deterding, 2011). Among studied TBL programs to date, the most prevalent game design principles involve the awarding of badges (i.e., awards for progress or skill mastery) or points so as to create a visible status signal within the game and the utilization of team-oriented competitions. While the field is generally lacking in rigorous experimental evaluations of game-based TBL programs, existing evidence suggests that game-based approaches improve both student learning and motivation (Papastergiou, 2008). In particular, badges have

been shown to correlate with improvement in learner motivation, particularly among low-performing students (Abramovich et al., 2013).

Technological literacy among instructors: Technological literacy is not currently a widespread problem, as centers tend to report it as a minimal barrier to TBL expansion. However, it remains a significant challenge among a notable minority, roughly 15 percent of centers. To address this challenge, centers could allow for more and better professional development for instructors in the area of technology skills. Considering possible improvements to existing professional development training, Jones and Dexter (2014) find that instructors often engage in independent and informal activities when learning a new TBL tool and argue that administrators should create more opportunities for this kind of independent and informal development. Instructors report that it's helpful to have a collaborating teacher with whom they can collectively plan and implement a TBL resource (Lee et al., 2010). Among other findings, the opportunity for collaboration also allows for the most technologically savvy instructors to serve as mentors to less-skilled peers. Last, instructors report that they prefer trainings that divide lessons in ways that are relatively narrow in scope and cover subject-specific (e.g., math-specific) examples (An and Reigeluth, 2011).

Conclusions

In this report, we have established that a large majority of Job Corps centers currently use TBL resources for the academic remediation of reading and math skills. Centers' use of these resources vary considerably, and only one software resource is in use by a majority of centers for remediation. Given budget constraints, most centers report that the cost of TBL resources poses a significant challenge to acquisition and implementation. Other challenges include software security requirements and limited internet connectivity and bandwidth. A small share of centers report challenges associated with instructors' and students' technological literacy and general capacity to use TBL.

Yet, given the programmatic environment in Job Corps, with rolling admissions of students with different academic skills at entry, giving students a platform for personalized and independent learning, which adapts to students' skill levels and provides real-time progress information to instructors, seems to make a lot of sense. Most center directors report that they think TBL resources can be as effective or more effective than traditional education for remediation of reading and math skills; but Job Corps needs to address several capacity-related challenges as it seeks to expand the program's use of TBL. Having established an understanding of the program's current use of TBL for academic remediation, additional research may be warranted to understand the effectiveness of TBL in this setting.

1. Introduction

Educational technologies have long held promise to facilitate learning for students at all levels and stages of their education. Year over year, larger shares of students are enrolling in online higher education courses and programs (Allen and Seaman, 2017). At the same time, a robust field of research has developed around exploration and evaluation of learning via educational technologies (Escueta et al., 2017; Means et al., 2009). Recognizing the potential for technology to transform learning, the Office of Educational Technology “sets a vision and plan for learning enabled by technology” in its National Education Technology Plan (Office of Educational Technology, 2017).

The existing literature has focused primarily on the role of technology in traditional K-12 or higher education settings. Researchers have given less attention to the role of technology in the context of workforce development and nontraditional education. To fill this research gap, the U.S. Department of Labor (DOL) Employment and Training Administration (ETA) has been actively exploring the viability and effectiveness of learning via educational technology, or Technology-Based Learning (TBL), in the public workforce system. The Department formalized this commitment as a national initiative in 2008 with the release of the Training and Employment Guidance Letter (TEGL) No. 17.07, *Using Technology-Based Learning in the Workforce Investment System*.

Since that time, ETA has pursued a number of complementary projects to develop knowledge around the use of TBL in the field and share best practices from across the workforce development system (Koller et al., 2008; Dunham et al., 2011; Maxwell et al., 2013; Gan et al., 2013). The research to date has focused on the delivery of employment services and training either through the Workforce Innovation and Opportunity Act (WIOA)-funded workforce investment system or by third-party training providers that partner with the system. In 2017, DOL modified a contract with Abt Associates and its partner, MEF Associates, to examine the adoption and use of TBL within Job Corps, the nation’s oldest and largest federally funded job-training and education program.

Job Corps is a residential academic and vocational training program that offers an intensive set of services and supports to some of the most disadvantaged youth in the workforce system. To enhance the longer term employability of participants, the program offers a customized array of educational, occupational-training, job-readiness and personal-support services in a highly structured residential environment.⁴ Reflecting the intensive nature of this investment, the per-participant cost associated with Job Corps enrollment is substantially higher than most other workforce development programs.

Given the multi-faceted nature of the program, Job Corps has incorporated educational technologies to support a variety of its education and training components. While Job Corps has incorporated TBL resources throughout the program, the focus of this study is on the use of TBL in the context of basic education skills: academic remediation in reading and math. Job Corps students typically enter the program with significant deficiencies in reading and math skills. Remediation of these deficiencies is an important step in the process of improving students’ employability and capacity for self-sufficiency. Given the complex instructional

⁴ Note that not all Job Corps students are residential. Some proportion of students, usually a small proportion at each center, is non-residential. However, residential and non-residential students generally receive similar services (Burghardt et al., 2001).

environment in which the Job Corps program operates, TBL resources and strategies offer an innovative approach to supporting academic remediation and other academic and vocational classes.

In this report, we systematically document and analyze the use of TBL across the entire network of Job Corps centers, reporting on the TBL implementation process, the challenges TBL faced during implementation, and the best practices for TBL that instructors, managers, and directors identified.

1.1 Purpose of the Report

This report presents the results of a mixed-methods analysis of the use of TBL methods among Job Corps centers to increase academic skills among students in need of remedial education in math and reading. The analyses are largely descriptive. The study team systematically documents the state of TBL adoption and utilization for remediation in Job Corp, synthesizing a combination of administrative, survey, and interview data that researchers gathered from practitioners and key informants. These inputs address the research questions explicitly posed by the DOL:

1. To what extent have Job Corps centers considered, planned for, and/or implemented technology-enhanced practices for math, reading, and technological literacy?
2. What factors do Job Corps centers/operators consider in selecting, designing, and implementing TBL offerings?
3. What TBL strategies are currently in use to support various developmental priorities, including basic education, soft skills, job readiness, and occupational-skills development? What instructional/curricular strategies are in use to support or complement the use of TBL resources?
4. How satisfied are instructors/administrators with the effectiveness of TBL instructional resources?
5. What are students' perceptions of the TBL instructional resources and their overall experience using them in a Job Corps setting?
6. To what extent does technological literacy continue to pose a challenge among Job Corps students, instructors, and staff? What strategies can Job Corps adopt to address this challenge?
7. What is the capacity (e.g., hardware, software, and Internet connectivity) among Job Corps centers to implement TBL?

For the purposes of our analysis, we rely on the definition of TBL outlined in Training and Employment Guidance Letter (TEGL) 17-07 by ETA:

TBL constitutes learning via electronic technology, including the Internet, intranet sites, satellite broadcasts, audio and video conferencing, Internet bulletin boards, chat rooms, Webcasts, simulations, gaming, and a variety of mobile options such as podcasting. TBL is an umbrella term, which also encompasses related terms, such as distance learning, on-line learning, Web-based learning (which only includes learning that occurs via the Internet), CDs and DVDs, and computer-based learning (by which we mean learning through the use of dedicated personal computers).

Others have offered alternative definitions of TBL or educational technologies. The alternative definition recognized by most of the field is that offered by the Association for Educational Communications and Technology (Januszewski and Molenda, 2008):

Educational technology is the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources.

Both definitions recognize TBL as inherently a general term that covers a wide range of concepts and tools, programs, and resources. For the purposes of this report, both definitions cover all of the TBL resources this review captures in the context of Job Corps.

After addressing these core questions, the report includes promising practices and notes lessons from the research literature that are most relevant to the challenges associated with implementation of TBL. These findings will provide the most comprehensive description to date on the use of TBL in Job Corps, building on DOL's existing knowledge and informing efforts to modernize and expand upon the use of TBL for remedial education throughout the Job Corps center network.

1.2 Overview of Research Methods and Limitations

In this report, we provide detailed documentation of the state of TBL in Job Corps for remedial instruction based on survey data from nearly all 127 currently operating centers and qualitative data we collected during two days of observations and interviews with each of seven visited centers. A detailed description of data collection methods is in Appendix A. In short, we administered the survey online through a web-based program. We sent a link to the survey form to all Job Corps center directors across the country.⁵ In addition, the Job Corps National Office provided the study team with supplementary administrative data on basic characteristics of Job Corps centers and the student population. Finally, we collected in-depth qualitative data through semi-structured interviews with Job Corps center staff, focus groups with students, and open-ended survey responses.

While the report includes a comprehensive presentation of the data, the study is nonetheless limited in several ways. First, the analyses are largely descriptive. Interpretation of the results should not suggest that they provide information about causal relationships between the different concepts related to use of TBL.

⁵ As explained in Appendix A, center directors were allowed to request assistance from other staff at the center, most likely academic managers, to complete the survey.

Other limitations of the survey data include respondents' knowledge, ability to recall relevant information, and subjective perceptions. While we sent the survey to each center director, the survey's instructions encouraged respondents to seek help from within the Job Corps center to complete each section, as needed. For example, the survey's functionality enabled a center director to assign a portion of the survey to an academic manager or other staff person at the center who was better suited to respond to certain questions. We expect that this approach allowed for more accurate data collection.

Since we conducted the survey and site visits on behalf of DOL at Job Corps centers that are contractually connected to DOL, respondents to the survey and site visit interviews may bias their responses to appear more favorable. That may be true despite assurances that the responses would be confidential. So-called "social desirability bias" is a form of response bias whereby respondents adjust their answers to over-report positive perceptions and behaviors and under-report negative ones.

Finally, nonresponse bias may affect the survey data. While the survey went to the universe of Job Corps centers and yielded an overall response rate of 91%, response rates differed among certain subgroups of centers, such as those operated by private contractors and those operated by the United States Forest Service. If the characteristics of those centers in our analytic sample differ systematically from the characteristics of the centers in the population of centers, then the responses to the survey are biased.

1.3 Structure of the Report and Alignment with Research Questions

The remainder of the report begins with a discussion in chapter 2 of the context in which Job Corps incorporates TBL. This includes a high-level description of the Job Corps learning environment, the role of remedial education, and the TBL-related policy environment. In this section, we also discuss/share/review the first set of results from our survey.

For the remainder of the report, we divide the discussion of Job Corps centers according to their reported current use of TBL for remediation. We discuss centers that responded to the survey as current users of TBL for remedial education separately from those centers that previously used TBL for remediation and those that have never used TBL for remedial education. Given the relative size of these groups, and the focus of this report, most of the discussion emphasizes those centers that currently use TBL.

Chapter 3 discusses the process by which centers select and implement TBL, including the roles of different stakeholders and the factors they take into consideration. This chapter aligns with research questions 1 and 2 from above. Chapter 4 documents the TBL resources and instructional strategies in use at Job Corps centers at the time of our data collection. This chapter aligns with research questions 1 and 3. Chapter 5 covers the perceptions of both Job Corps staff and students with regard to the TBL experience and the effectiveness of TBL methods of instruction. This chapter aligns with research questions 4 and 5. Chapters 6 and 7 both present the challenges that centers report, first with regard to the instructional challenges related to TBL and second with regard to centers' structural capacity to support use of TBL resources. These chapters align with research questions 6 and 7, respectively. Finally, Chapter 8 summarizes our findings and presents recommendations for ways that Job Corps might address the challenges identified by our analysis.

2. Context for TBL Implementation and Current Use

To interpret the findings from this study productively, it is important first to understand the policy and programmatic context in which Job Corps implements TBL. This chapter begins with a review of relevant research to date regarding TBL in Job Corps and DOL’s overarching interest in examining the viability and potential expansion of TBL (section 2.1). Then, we describe Job Corps’ remedial educational setting, which is the focal point of this study (section 2.2), and we provide a short discussion of the prevalence of TBL in Job Corps, in the context of both remediation and Job Corps overall (section 2.3).

2.1 Context for Research on TBL in Job Corps

Over the last decade, there has been limited research that explores TBL’s potential in settings relevant to Job Corps. Some impact analyses of TBL or computer-assisted instruction more generally have found small positive impacts or no significant impacts on basic-education learning among other disadvantaged adult populations (Nicol and Anderson, 2000; Batchelder, 2000). However, there are a few studies of the Job Corps program. Some are dated, and others are limited in scope. A 2006 qualitative review of six Job Corps centers documented each center’s approach to literacy education, including a basic description of the role of technology (KPMG, 2006). In 1992, researchers experimentally evaluated the learning impacts of a computer-assisted instruction demonstration project in 10 Job Corps centers. They reported small but insignificant impacts relative to traditional education classes (Johnson and Geller, 1992). More recently, the Job Corps National Office has conducted small-scale pilots of several TBL programs across a handful of centers. In a non-experimental analysis of the READ 180 blended learning program, researchers found that learners at participating Job Corps centers and learners at matched, non-participating centers both showed no significant improvement on the Tests of Adult Basic Education (TABE) (MANILA Consulting Group Inc., 2008). In a recent pilot, conducted in 2017, analysts gathered student and instructor feedback on some of the TBL resources that we included in the survey and discuss in Chapter 4. In all, this research literature is small. The present study discussed in this report offers the first full-scale review of the use of TBL for academic remediation across the entire Job Corps center network.

In general, the motivation for continued research into the role of TBL in Job Corps comes from two sources. First, researchers, educators, administrators, and policy professionals have long debated the role of technology in education. Of particular relevance to this study, some participants in that debate have raised important questions around the efficacy of TBL strategies for students with lower levels of academic proficiency (Dynarski, 2018). The concern stems from several studies suggesting that students with less preparation or poor records of academic performance are less likely to perform well in a technology-based setting (Heppen et al., 2016; Bettinger et al., 2017). Job Corps students are generally among the most disadvantaged, having typically struggled in or dropped out of traditional high school settings.

Second, TBL appears to hold particular promise in the context of Job Corps. Relative to traditional high schools, Job Corps centers offer a unique instructional environment by virtue of rolling admissions and a wide range of student educational levels and experience at entry. Unlike traditional high schools, in which students enter at a fixed date, Job Corps centers have to incorporate a regular inflow of new students, typically on a weekly basis. Moreover, these students enter with a range of education levels. It falls to center staff to assess these students quickly and place them in remedial courses that align with both their learning styles and levels. To mitigate the challenges of this instructional environment, Job Corps has

maintained a long-standing interest in the instructional potential of technology-based learning solutions. The combination of TBL's potential to address instructional challenges in Job Corps, coupled with a need to improve understanding of its effects among disadvantaged students, motivates continued interest in TBL-related research in Job Corps.

2.2 Background on Remediation in Job Corps

Job Corps serves a population of students that typically struggle in traditional academic educational settings. While students enter Job Corps at high school age or above, a substantial share arrives with significant educational deficiencies. They commonly possess some form of learning disability, and face significant barriers to employment.

The Policy and Requirements Handbook (PRH), which governs the operation of all Job Corps Centers, requires the use of TABE to assess math and reading proficiency among all arriving participants. With few exceptions, these assessments take place during the first three weeks of their stay on the center. These initial math and reading scores identify which students need placement in remedial academic education. If a student's scores are below a certain threshold, they must engage in reading and/or math instruction until their scores improve and meet the established testing threshold.⁶

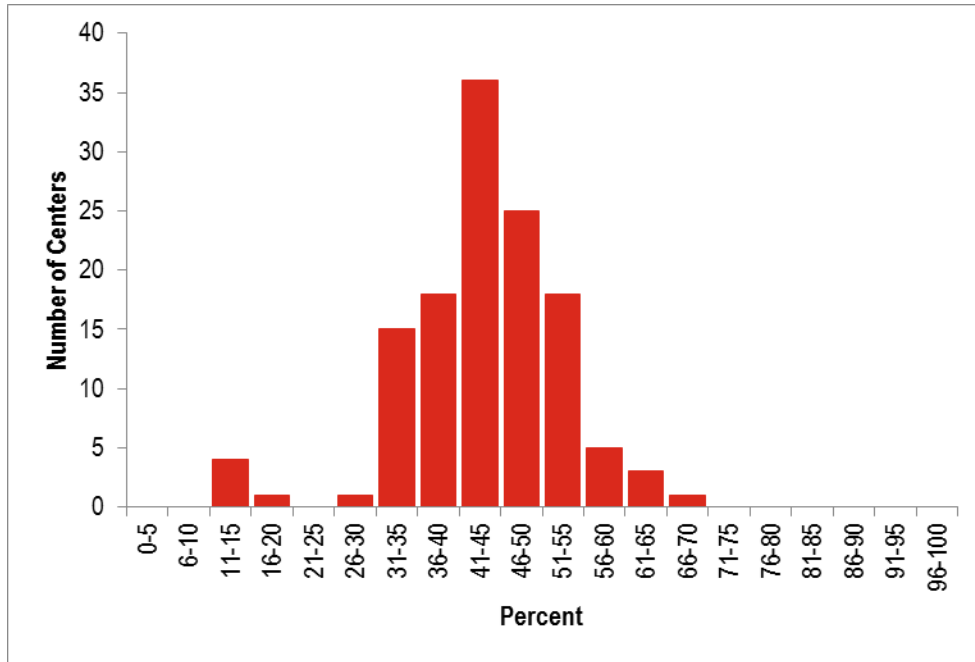
A typical Job Corps student will require some amount of academic remediation in math or reading. Exhibits 1 and 2 present the distribution of Job Corps centers according to their average proportion of students who test, at the point of program entry, above the remedial threshold for reading and math on the TABE test. In most centers, less than half of students, on average, pass the reading TABE subtest, and less than 35% of students, on average, pass the math subtest. Previous studies of literacy and numeracy skills among Job Corps students report students' reading fluency at about a 5th grade level, functional reading skills at about an 8th grade level, and functional numeracy skills at about a 6th grade level (Mellard et al., 2012).

While the PRH specifies TABE assessment and testing, it does not specify the type of remedial instruction (e.g., individual, group, use of TBL). Rather, the PRH simply sets general expectations around centers' obligations to offer services that are effective at meeting program goals. Centers have the autonomy to select the instructional approach and resources that they feel are best suited to their center. The National Office expects centers to consider TBL strategies among those approaches.

As we discuss in detail in the rest of this report, once a center places students into remedial education, centers can vary widely in their approach to instruction, particularly with regard to their use of TBL. Job Corps centers' choice to integrate the use of technology in their instruction is profiled below.

⁶ Students that score below 567 on the reading subtest and 566 on the math subtest – both of which correspond to a ninth-grade level equivalent – must complete academic remediation classes.

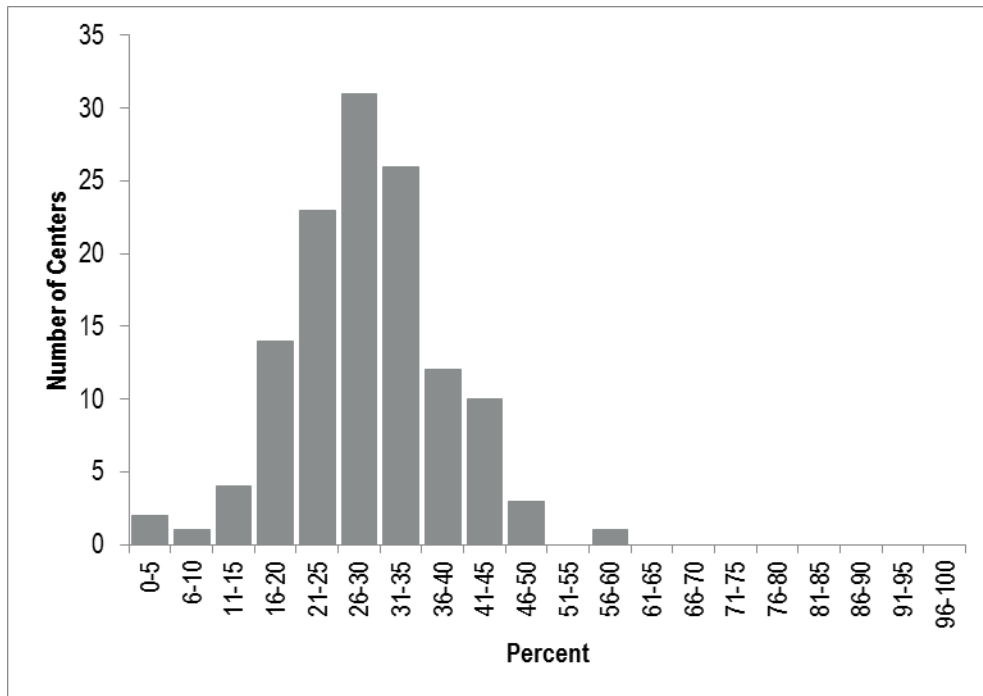
Exhibit 1: Distribution of Job Corps Centers by Average Proportion of Students that Pass Remedial Reading Threshold at Entry, Program Years 2015-2017



n = 127 centers

Source: Job Corps administrative data.

Exhibit 2: Distribution of Job Corps Centers by Average Proportion of Students that Pass Remedial Math Threshold at Entry, Program Years 2015-2017



n = 127 centers

Source: Job Corps administrative data.

2.3 Prevalence of TBL Use: Overall and for Remediation

To examine Job Corps centers’ use of TBL to support math and reading remediation, the survey first identified the extent to which centers currently use TBL in general, across a broader range of instructional areas. Exhibit 3 presents the prevalence of TBL methods and strategies across that range of instructional areas and service scenarios at Job Corps. Of most relevance to this study, a large majority – 99, or 86% – of centers report that they currently use TBL strategies to support remediation of basic math and reading skills.

While academic remediation is the area with the highest prevalence of TBL use, it is certainly not the only instructional area in which centers incorporate technology. In fact, only one center reported using TBL methods only for remediation. Among the rest, centers frequently use TBL for the delivery of high-school level instruction to students pursuing a high school diploma or a General Equivalency Diploma (GED). Across the remaining instructional areas, approximately two-thirds to three-quarters of respondents use TBL for purposes as diverse as English as a second language (ESL) instruction, career and technical training, and job search. In all, this suggests that nearly all Job Corps centers have some basic level of familiarity with the use of technology to support learning.

Exhibit 3: Prevalence of TBL Strategies at Job Corps Centers

Instructional Area	Number of centers (percent)
Academic remediation of reading and/or math skills	99 (86%)
High school level academics/GED, high school diploma, or equivalent	110 (96%)
Services to students with Individualized Education Programs	77 (67%)
ESL	85 (74%)
Employment readiness/workplace basics	77 (67%)
Occupational exploration	88 (77%)
Job search/resume preparation	92 (80%)
No areas other than reading/math remediation	10 (9%)
Career and technical training	80 (70%)
Other	12 (10%)

Note: The total number of survey respondents is 115.

Source: Abt Associates/MEF Survey of Job Corps centers.

Having identified this overall prevalence of TBL methods in Job Corps, the rest of the analysis in this report focuses on centers’ experience with TBL in the context of academic remediation. To start, the survey categorized respondents into one of three groups based on their current or past use of TBL methods of remedial education. The first group consists of those 99 centers identified above as current users of TBL methods for remedial education. The second group consists of those that do not currently use TBL methods for remedial education but have done so in the past. The third group consists of those centers that have never used TBL methods for remedial education. Exhibit 4 presents the number of centers categorized into each group. Of the 16 centers that do not currently use TBL, 4 have done so in the past, and 12 have never used TBL. This suggests that, at the most basic level, TBL methods are commonplace in Job Corps remediation instruction.

Exhibit 4: Current and Past Use of TBL for Remediation

Group	Count (percent)
Currently use TBL for remediation	99 (86%)
Do not currently use TBL for remediation but have done so in the past	4 (3%)
Never used TBL for remediation	12 (10%)
Total	115

Note: The total number of survey respondents is 115.

Source: Abt Associates/MEF Survey of Job Corps centers.

For the remainder of this report, we focus our analysis on those 99 centers that are current TBL users. As appropriate, particularly when we discuss challenges to implementation and perceptions of TBL, we will incorporate feedback from those centers that previously used TBL for remediation or have never done so. We will note when these centers have been included in the discussion.

3. Factors Considered in the Selection of TBL

While much of this report focuses on a center's experience with TBL currently in use, this chapter covers those earlier stages related to adoption of TBL. It is important to carefully examine these decisions since they often are complex and potentially involve capital investments, staff development and/or the modification of traditional instructional approaches. Understanding the nuances of TBL selection and implementation decisions is also valuable in that they potentially shape the student experience, the teaching experience, and ultimately the impact on learning outcomes.

We divided this chapter into three parts. Section 3.1 discusses the extent to which center leaders confirm plans to expand their use of TBL and their vision behind those plans. Sections 3.2 and 3.3 discuss the roles that various stakeholders play in the process of selecting and implementing TBL resources and strategies. Finally, Section 3.4 reviews the factors these stakeholders take into consideration when expanding TBL offerings at their centers.

3.1 Process of Selection and Implementation

The process for selecting and implementing TBL resources and strategies relies on the coordinated involvement of different stakeholders. Based on data we collected during site visits, this section identifies those stakeholders and their respective roles in that process.

It is helpful to organize the discussion of TBL selection and implementation around each stakeholder's relationship to the Job Corps center itself. That is, stakeholders are either external to the center or operate within the center. The relevant *external stakeholders* include the program's central administrators from the Job Corps National Office and the associated regional offices, the contracted center operators, and the developer of the TBL resource. *Internal stakeholders* include a center's leadership and management (e.g., a center director and academic manager), classroom instructors, and students.

According to the survey, internal stakeholders have, to date, been responsible for handling decisions regarding the selection of TBL resources and strategies. A substantial majority (75%) of survey respondents identified local center staff as the primary decision makers regarding selection of TBL. Only 15% report their corporate contracting operator as the primary decision maker, and another 5% report the Job Corps National Office.

We identified three typical scenarios for selection of a TBL resource for remedial instruction: a center-driven initiative, a center operator-driven initiative, or a national initiative. Stakeholders internal to the center direct the *center-driven* selection process. The survey results reported above suggest that this scenario is the most common. Center directors often report that internal staff have the freedom to identify a TBL resource or strategy that may be appropriate for inclusion in the center's remedial academic instruction. Center leaders usually describe this as a bottom-up approach, whereby instructors or academic managers identify a TBL resource, such as an online instructional program, and request approval from center management to use it within the classroom.

If the preferred TBL strategy also necessitates the purchase of hardware or other ancillary resources, the center may require additional approval from the contracting operator. Not surprisingly, staff members report that this type of bottom-up approach to selection is more feasible when the TBL resource is freely and publicly available. We discuss cost constraints associated with TBL selection in section 3.2.

External stakeholders lead the other two selection scenarios. The *center operator-driven* scenario is common among those Job Corps centers operated by private contractors, likely by those that manage multiple centers. When operators initiate the selection and implementation of new TBL strategies and resources, they're often motivated by a desire to collect and spread best practices across the network of centers under their management. As one center director put it:

"I believe if [the center operator] is making an investment in one center, they are hopefully looking at it holistically and would want to roll it out everywhere...[the center operator] would go to their centers and say 'give us your best practices for TABE literacy'."

Under these circumstances, local centers report that they feel compelled to adopt TBL resources. When directives come from the operator, center leaders report that they follow those requirements. However, the local center level may still determine details around implementation. For example, in one center, the academic manager reported that while the contracting operator selected the TBL strategy, the resource in question did not map perfectly onto existing credit requirements for a particular subject area. In that case, the academic manager determines when a student in a TBL environment has met those requirements. Moreover, instructors remain responsible for day-to-day implementation of TBL resources.

Relative to the two scenarios described above, *nationally-driven* acquisition and dissemination of TBL throughout the Job Corps network is less common. Generally, individual centers or center operators select TBL resources for remedial education. However, centers consistently cite one existing TBL resource as the product of a national initiative: SMART Boards. We discuss centers' typical experience with SMART Boards in a later chapter.

3.2 Factors Most Relevant to Selection of TBL

The Policy and Requirements Handbook governs details regarding the operation of Job Corps programs, and centers must meet certain standards for service provision. However, within the boundaries of those requirements and expectations, individual Job Corps centers have considerable flexibility when designing and implementing their programs. This flexibility extends to the selection of TBL resources and strategies. This section discusses some of the most important factors that centers consider when making those selections.

The survey included three questions regarding factors associated with TBL selection. Each question asked respondents to identify from a list the three most important factors associated with hardware, software, and program features.⁷ We did not ask respondents to rank the three factors they identified since centers may not be able to report their preferences to that level of specificity.

For factors considered most important to the selection of hardware and software, we grouped results into three categories:

- **Feasibility** factors include cost, compatibility with a center's existing technology, installation/maintenance/tech support requirements, and connectivity and reliability of the connection. These factors relate to the center's capacity to implement a selected TBL resource

⁷ See survey instrument in Appendix C for details.

- **Suitability** factors include alignment with TABE standards, alignment with student skills or needs, features of the TBL resource, effectiveness of the TBL resource, and the National Office of Job Corps' preferences. These factors relate to the extent to which a given TBL resource is the most appropriate or best selection
- **Usability** factors refer to students and instructors' ability to use the TBL tool as intended. After the determination of a given resource as feasible and appropriate for the Job Corps center, these factors relate to the extent to which students and teachers can properly use the resource once implemented

Overall, no single category of factors has priority over the others, but centers do consistently prioritize certain individual factors within each category. Additionally, these concepts are meant to be descriptive, and they are all interrelated. Exhibit 5 lists each factor and its associated category in order of the frequency with which centers cite it as a top-three factor for consideration. We discuss each category further in the sub-sections below, followed by a fourth section related to the factors associated with TBL program features.

Feasibility. When selecting any TBL resource, either hardware or software, centers most commonly rate two feasibility factors as among the most important for selection: cost of the resource and compatibility with existing technology. About 70% of centers report that cost or availability of funding is one of the top factors when selecting hardware (73%) or software (68%). The second most commonly cited factor for selection is compatibility with existing technology, reported by over half of centers. No other factor was cited by a majority of centers, suggesting that centers must give more consideration to the feasibility, particularly as it pertains to cost and compatibility, of implementation of a particular TBL resource over the suitability or usability of that resource. This makes intuitive sense, since feasibility of implementation is a necessary condition for a center to move forward with selection of a resource. Centers cannot select a resource that may otherwise be suitable or usable if it's too costly or incompatible with the center's capabilities.

Interestingly, centers did not frequently report other feasibility-related factors, namely connectivity or installation, maintenance, and tech support, among the most important considered for selection of TBL. Some of our qualitative findings collected on site visits complicate the interpretation of this result. First, centers that employ a designated IT technician or support staff person often report that this position is crucial to the implementation of a TBL resource. Moreover, centers commonly cite difficulties with internet connectivity as a challenge to TBL implementation. It's possible that centers considered these other feasibility factors as contained within the broader factor related to compatibility with existing technology. Alternatively, this result may reflect a sentiment among centers that, while these two feasibility-related factors are important, the associated challenges are not insurmountable, and for that reason, these factors are not the most important to the selection of TBL resources.

Suitability. While generally less prominent than those factors related to feasibility, the suitability of a given TBL resource is nonetheless important to the TBL selection process, particularly with regard to the selection of software resources.

With regard to selection of software, about 40% of centers report two factors among the most important: compatibility with TABE standards and the demonstrated effectiveness of the resource. Centers likely give considerable weight to alignment with TABE standards because academic remediation in Job Corps ties directly to student performance on the TABE. Of course, TABE performance is not the sole

motivation for academic remediation. Centers acknowledged during site visits that basic reading and math instruction skills are necessary to facilitate entry into employment and to develop students’ capacity for self-sufficiency beyond the Job Corps program.

A substantial share (40%) of centers also reports that the proven effectiveness of a TBL resource is an important factor for selection. However, in several open-ended responses, centers say that while they might prefer to make selections based on proven effectiveness, many TBL resources have not been evaluated. Most resources certainly have not been evaluated in the context of a remedial student population.

Interestingly, centers are not likely to consider a TBL software resource’s features (e.g., monitoring tools). Given the variability in software design, instructional strategies, and features, we expected centers to give more consideration to the detailed features of a software resource. Instead, it appears that centers focus their attention on effectiveness – which we also consider a suitability concept – rather than individual features.

With regard to the selection of a hardware resource, about 40% of centers report that they consider alignment with students’ needs or skills among the most important factors for selection. Beyond that single factor, it appears that our concept of suitability is generally less of a concern for hardware selection. A smaller share (24%) of centers reports alignment with TABE standards as a top factor, but this may capture the purchase of computers that centers use to administer the TABE test, rather than for remedial instruction. Centers typically maintain a set of computers in a designated TABE testing room.

Usability. The concept of usability is closely related to that of suitability, insofar as an unusable resource is certainly not a good fit for instructors or students. Nonetheless, we distinguish between suitability, or the extent to which a TBL resource is appropriate for the academic remediation environment, from usability, or the extent to which a center will use that resource for remediation.

Exhibit 5: Factors considered for selection of TBL hardware and software

Hardware	Percent	Software	Percent
Cost (feasibility)	73%	Cost (feasibility)	68%
Compatibility with existing center tech (feasibility)	54%	Compatibility with existing center tech (feasibility)	60%
Ease of student use (usability)	39%	Compatibility with TABE standards (suitability)	42%
Alignment with student needs and/or skills (suitability)	38%	Effectiveness research (suitability)	40%
Connectivity and reliability of connection (feasibility)	26%	Ease of student use (usability)	36%
Compatibility with TABE prep program standards (suitability)	24%	Features of TBL software (suitability)	17%
Installation, maintenance, and tech support (feasibility)	16%	Job Corps National Office preferences (suitability)	14%
Ease of instructor use (usability)	11%	Ease of instructor use (usability)	10%

n = 98 (current users of TBL for remediation).

Source: Abt Associates/MEF Survey of Job Corps centers.

Centers are about equally as likely to consider ease of student use as a top factor for consideration when making a selection of either a hardware or software TBL resource. About 39% of centers report ease of

students' use of a hardware resource as one of the top factors for consideration. About 36% report the same for selection of a software resource. In general, the survey findings reveal that centers give considerably more weight to ease of students' use of a TBL resource – either hardware or software – over the ease of instructors' use. Only about 10% of centers report the ease of instructors' use of TBL as a top factor for consideration of either a hardware or software resource.

Given the kinds of TBL programs observed during site visits, this finding makes sense. The site visit teams often observed students working independently in TBL programs in a self-paced, asynchronous setting.⁸ Students must be able to operate the hardware through which the program is delivered, and they must directly engage with the software as they complete assessments, instructional modules, quizzes, or tests. Instructors, meanwhile, typically don't directly work in the TBL environment and instead are available to offer subject-matter assistance as needed. Their ability to use the TBL resource thus is less important.

While student usability of TBL software is reportedly more important than an instructor's, most centers do not cite either as top factors for consideration. This might be because centers perceive students and instructors as increasingly comfortable in technology-based environments. Today's Job Corps students are popularly considered "digital natives," a term that identifies them as having grown up surrounded by and immersed in technology, such that they have an innate familiarity and understanding of how to operate and learn in a technology-based environment.⁹ To the extent that Job Corps staff identify their students in this way, centers should be less inclined to prioritize ease of student use when selecting a TBL resource and instead assume students can easily use most or even all TBL software options.

Still, some center leaders emphasize that TBL resources need to take into consideration student-level usability and suitability of a TBL resource. As one center director said:

"...a large portion of students we get have some serious challenges and that has to be taken into consideration when looking into any type of technology or software for these students to learn from...I don't think we can get away from technology but for Job Corps, it needs to be geared towards the clientele being recruited for the program."

Alternatively, other center staff feel as though their TBL tools are sufficiently user friendly and even somewhat simple in their design, so no student should struggle with the tool. One academic manager reported:

"Neither program requires the student to be very tech savvy. Truthfully, the more difficult thing they have to do when they get here is getting them logged onto the portal, but once they are on the websites, there is no issue as far as that goes."

Instructional features. The survey also asked respondents to identify the features of a TBL program that were most important to program selection. The results provide insight into the relative importance of

⁸ We define the concept of synchronicity in Chapter 4.

⁹ While this conceptualization of young people dates back to the 1990's and has garnered significant popular attention, there is an ongoing debate as to its critical merits (Bennett et al., 2008; Margaryan et al., 2011; Helsper and Eynon, 2010).

different instructional design elements of a TBL program. Exhibit 6 lists the share of respondents that report each feature among the top three.

Across the seven feature options, about 60% of centers identify self-pacing, personalized instruction, and skills-based assessments for completion among the most important features. This finding is consistent with the qualitative data we collected during site visits. Most of the visited centers report that an advantage to TBL instruction is that it creates efficiencies for instructors’ use of time. Classrooms comprise students with a diverse set of academic abilities and educational levels at program entry. Assessment features that enable instructors to identify students who need the most attention and enable students to work independently at their own pace all contribute to instruction efficiencies.

Two additional factors – requirements for skill mastery (47%) and self-directed learning (38%) – received substantial consideration, albeit by a minority of centers. Finally, the two factors that receive the least consideration are those that an in-person instructor can offer most easily in a blended learning environment, namely automated help via a digital tutor (14%) and rewards for progress (7%). During site visit observations, instructors were often available to students as they worked independently in a TBL environment. These instructors were available to help students who needed personalized assistance. Instructors also offered encouragement or recognition of progress. Therefore, centers may be less inclined to seek out these features from a TBL program.

Exhibit 6: Content features of TBL programs

TBL program feature	Percent of centers
Assessments to determine skill acquisitions or course completion	62%
Adaptive questions and exercises to personalize learning	61%
Ability to complete work at one's own pace	58%
Level of knowledge required for mastery of a skill	47%
Ability to self-direct learning, enabling students to choose activities to complete	38%
Inclusion of a digital tutor or automated help function	14%
Rewards and digital certificates to recognize progress	7%

n = 98 (current users of TBL for remediation).

Source: Abt Associates/MEF Survey of Job Corps centers.

3.3 Center-Level Plans for TBL

Findings from the survey indicate that a majority (64%) of centers plans to expand current use of TBL resources for academic remediation, and even more (71%) plan to expand the use of TBL generally. However, the survey does not differentiate between centers with perhaps informal or preliminary plans and centers with clear and well-developed plans for TBL expansion. When we discussed this issue on site, we found that all centers referenced at least a preliminary expectation that they would expand their use of TBL for remediation. In some cases, this did not reflect their own plans, but rather the expectation that an external stakeholder (e.g. DOL, corporate management) would be advancing the TBL agenda.

Only two centers visited were able to provide concrete, detailed plans to support their expressed intentions. In both cases, traditional classroom-based instruction or paper-and-pencil exercises would serve as more of a supplement or follow-up to TBL strategies. As one respondent put it:

“The vision is that students would get the internet-based material and would have an option to do it on their own...My vision is they would do this all on their own, and we could track their progress, and then they would only come to class if they need help.”

3.4 Summary

In summary, internal stakeholders primarily handle decisions regarding the selection of TBL resources and strategies. A substantial majority (75%) of survey respondents identified local center staff as the primary decision makers for TBL selection. When making these decisions, centers are most concerned with the feasibility of implementing a selected TBL resource, particularly the cost of the resource and its compatibility with the center’s existing technology capacity. About forty percent of centers ranked factors related to suitability – effectiveness and alignment with the TABE – among the most important factors for software selection. While centers did not typically consider students’ ability to use a selected TBL resource as one of the most important factors, they are more concerned with a student’s ability to use the resource over that of the instructor’s ability to do so. Finally, we found that while a majority of centers currently using TBL report having plans for expansion of TBL, in reality, it may be the case that relatively few, and perhaps less than half, have developed a clear vision for how they would like to develop their TBL resources for remedial education.

4. TBL Resources and Strategies Currently in Use for Remediation

The hardware and software available for use in remediation depend on cost, compatibility with existing technology, and compatibility with the TABE test, as discussed in Chapter 3. This chapter presents a snapshot of the use of TBL in Job Corps. Centers responding to the survey identified those hardware and software resources currently in use, both in the context of remediation and more broadly in any instructional area. Centers also identified the prevalence of technology in certain instructional settings.

4.1 Hardware

Exhibit 7 presents the prevalence of different hardware resources among centers currently using TBL for remediation. Four types of hardware are very common or nearly ubiquitous: laptop/desktop (96%), SMART Boards (94%), projectors or other presentation equipment (89%), and television or video (87%). However, in the context of remedial education, each of these resources is in use by roughly half of centers. Therefore, we can't know the extent to which the hardware in use for TBL instruction for remediation is uniform across the Job Corps network.

During several site visit interviews, Job Corps staff and students reported a desire for more sophisticated or modern technologies. All of the visited centers had at least one SMART Board at the center. These instructional boards enable interactive engagement and internet-enabled display. Among visited centers, one reserved SMART Boards for exclusive use in the remedial math and reading classrooms. The extent to which instructors use the full capability of the SMART Boards varies.¹⁰ At present, other modern technologies, such as smartphones (12%) or tablet computers (14%), are in use among a notable minority of centers, but they certainly are not commonplace. None of the visited centers currently allow use of cellphones or other mobile devices in remedial education classrooms. Indeed, they often have strict policies against cell phone use, citing the potential for student distraction. In the past, some of these centers have made exceptions for certain instructional activities, such as an online program that enables students to complete real-time quizzes in class using a software application downloaded to their cell phones.

Exhibit 7: Hardware In-Use for TBL

Hardware resource	Any instructional area	Remedial education
Laptop or desktop	96%	56%
SMART Board	94%	56%
Projector or presentation equipment	89%	51%
Television or video	87%	44%
Audio player	42%	27%
Telephone or videoconference equipment	38%	14%
Smartphone	19%	12%
Tablet or touchscreen laptop	16%	14%

n = 99 (current users of TBL for remediation).

Source: Abt Associates/MEF Survey of Job Corps centers.

¹⁰ For further discussion on instructor challenges, see Chapter 6.

The survey also asked respondents to identify the setting in which students typically access these hardware resources. During site visit observations, the visiting teams noted hardware resources present in different locations around each center. Students’ access to these resources may depend on the center’s decisions around installation. That is, students are likely to use hardware that resides strictly in a classroom during class hours only. Other options may afford students more flexibility for when and how students access a center’s resources. Students generally access these hardware resources in three different ways:

- **In a Job Corps classroom.** 100% of centers that currently use TBL for remediation house hardware in a Job Corps classroom. Six of the centers visited had at least one desktop computer in remedial classrooms
- **In a Job Corps computer lab.** 70% of centers that use TBL for remediation offer access via a computer lab. However, only three of the centers visited had separate computer labs. Focus groups indicated that students rarely use them for coursework
- **In a dormitory common space.** 62% of centers that use TBL for remediation offer access in dormitory common spaces. Some students mentioned using computers in the dorms to job search, apartment hunt, and plan for life post-Job Corps

4.2 Software

As discussed in Chapter 3, centers consider multiple features when selecting software for remediation, including assessments to determine skill acquisitions or course completion, adaptive questions, and a self-paced design to the instruction. Centers face a multitude of options from which to select the software resource of most interest to them. The survey asked respondents to identify those programs currently in use in the center. Exhibit 8 lists those TBL programs currently used by at least 10% of respondents.

Exhibit 8: Prevalence of software programs among centers currently using TBL for remediation¹¹

Software Program	Share of centers reporting:	
	Current use	Previous use
Khan Academy	53%	20%
Instruction Targeted for TABE Success (ITTS)	27%	10%
Achieve 3000	25%	10%
READ 180	16%	16%
IXL	13%	7%

n = 99 (current users of TBL for remediation).

Source: Abt Associates/MEF Survey of Job Corps centers.

The list below offers more detailed information on programs listed in Exhibit 8.

- **Khan Academy.** Launched in 2006, Khan Academy is an online repository of video recordings of short lectures on topics ranging from grammar and basic math to computer programming.

¹¹ Respondents also identified Penn Foster as one of the most frequently used software program in Job Corps, but this is most likely for high school academic instruction, not reading and math remediation in the context of TABE test preparation.

Students can watch videos and complete practice material on their own, or instructors can use the website to assign specified videos and practice exercises for students to complete at their own pace. The website also gives instructors the ability to track student progress. We made site visits to four centers that currently use Khan Academy.

- **Instruction Targeted for TABE Success (ITTS).** Written by McGraw Hill, the company that develops the TABE, ITTS enables students to complete assigned lessons at their own pace. Lessons are available in reading, math, and language. Students' TABE scores determine assignments. Students navigate through the online content and complete quizzes and post-tests to demonstrate mastery. Instructors can track students' progress and time spent working. We made a site visit to one of the centers that currently use ITTS for remediation.
- **Achieve 3000.** Achieve 3000 is an adaptive, online literacy program. Through its designated instruction steps, students will respond to group polls, read articles, and answer reading comprehension questions. Achieve 3000 provides the same curriculum at different levels, enabling students to work through lessons at their own pace and reading level. We made a site visit to one of the centers that currently use Achieve 3000 for remediation.
- **READ 180.** READ 180 is a reading comprehension program with interactive content that centers can use for group learning, a TBL application, and independent reading. Designed for students in Grades 4-12, the program offers a blended learning experience for students. Read 180's technology adjusts instruction based on student responses and builds on that knowledge to meet each student's reading needs. We made a site visit to one of the centers that currently use Read 180 for remediation.
- **IXL.** This web-based program provides unlimited practice for a variety of subjects, including math and reading. The program is adaptive--question difficulty adjusts to student performance--and includes word problems, interactive activities, and a variety of question types. It enables instructors to see the number of questions in a skill area that students attempted to answer and the time elapsed. We made a site visit to one of the centers that currently use IXL for remediation.

In addition to those commonly-used programs listed above, at least 5% of centers reported using KeyTrain, Math 180, MyLab Math, PLATO, Aztec, and Rosetta Stone (ESL-specific). The National Office has expressed an interest in two additional TBL resources, Applied Educational Systems (AES) and Lexia Learning, both of which are currently in use for remediation at only 1% of centers that use TBL.

In all, Job Corps centers have adopted a diverse set of software programs. A majority of centers has some familiarity with using TBL resources for remedial education. The next section explores the instructional approach to incorporating software resources in the classroom.

4.3 Instructional Strategies Used for TBL

Having selected a given TBL resource, centers face strategic decisions around implementation of the resource. To some extent, the nature of the resource itself dictates implementation choices. For example, an immersive, computer-based program will naturally require a different instructional strategy from a program that uses a document projector or other presentation equipment. Still, centers have significant control over the instructional approach they use for a given TBL resource. This section offers a framework for conceptualizing the approach to instruction with a TBL resource. Within that framework, this section categorizes each of the seven centers the study team visited, and categorizations are based on qualitative data collected from classroom observations.

We categorize each approach to TBL instruction along the following three dimensions:

- **Synchronicity:** The extent to which students are engaged in learning independently and at their own pace (i.e., asynchronous) versus group-oriented instruction in which students are learning together (i.e., synchronous).¹²
- **Blendedness:** The extent to which a center uses technology in conjunction with traditional instructional methods. Strategies that use a combination of both technology-based and traditional learning are “blended.” Strategies that rely heavily on TBL with minimal traditional educational input are “technology-focused,” while those that rely on TBL simply as a supplement to traditional instruction are “traditionally-focused.”
- **Role of the instructor:** This categorizes a strategy as either instructor-led or one in which instructors are available to assist with TBL-based instruction. Instructor-led strategies rely on instructors to navigate course material, determining pacing and presentation of content. In the alternative approach, instructors are available to support students typically engaged in content-driven TBL instruction.

We categorized each of the seven visited centers into one of three types. We discuss each in the following sections.

4.3.1 Asynchronous technology-focused instruction with instructor support

Under this strategy, the TBL resource itself is central to instruction. Students typically engage with course content via a computer-based program that may deliver instruction in a variety of ways, including video lectures, interactive reading exercises, or practice questions. Instruction may be modular, with material divided into self-contained units. Students usually are able to complete modules at their own pace, with opportunities to make mistakes and repeatedly engage with content as necessary. In this way, the strategy is asynchronous, as students need not learn together and at the same time. The role of the instructor is to support students as they complete required TBL-based courses. Instructors are present in the classroom to answer students’ questions as they come up.

We observed this type of instructional approach in four of the seven visited centers. These centers used several TBL programs for remediation, including ITTS, Reading Horizons, READ 180, Khan Academy, Read Theory, and IXL. In several of these centers, instructors have the option to provide students with independent paper-and-pencil practice questions as an alternative to TBL-based instruction. However, when engaged with TBL, students were largely learning in an exclusively computer-based environment.

Features vary across these TBL programs. Within some of the programs, instructors not only answer questions on an as-needed basis, but they also have the ability to track student progress and performance in different learning areas. Programs may adapt content in response to student performance, adjusting the level of difficulty to reflect different students’ mastery levels. Others enable students to have some control over the content of the program, such as selecting reading subjects that most interest them.

¹² The concept of synchronicity does not necessarily involve technology at all. In the absence of any technology, educational instruction can be either synchronous, such as a traditional classroom-based setting, or asynchronous, such as textbook-based independent study.

4.3.2 Synchronous traditionally-focused instruction led by instructors

Under this strategy, the TBL resource is usually a supplement to traditional remedial educational approaches. Students are typically present in an instructor-led classroom. TBL resources are available in the classroom, and instructors determine the extent to which they incorporate the resources into each class. The strategy is generally synchronous, in that students all engage with the same course material on each class day. While students may master different concepts at different rates, students are generally not able to complete each course at their own pace.

We observed this instructional approach to using TBL in three of the seven visited centers.¹³ The TBL resources present in each classroom usually included a SMART Board and personal computers. In one center, instructors also used a document camera to project reading exercises onto a whiteboard for group-based instruction. Use of SMART Boards and personal computers varied across centers and was usually limited in scope. In only one instance did we observe an instructor use the SMART Board's interactive functionality. In most cases, the boards were present in classrooms and functioned mostly as white boards or projector screens. Personal computers in each remedial classroom were unused during observations. We cover the challenges with use of TBL resources in subsequent chapters.

4.3.3 Synchronous technology-focused instruction led by instructors

Under this strategy, the TBL resource is the central focus of the instructional approach. But unlike other TBL-focused strategies, the instruction is synchronous and instructor-led. The instructor navigates a computer-based program, in this case Achieve3000, in front of the class, illustrating key points and offering additional explanation of complex concepts. As a group, students follow the program's content, watch instructional videos, and complete practice exercises. The strategy is synchronous, like that of a traditional classroom setting, and fully blended. Additionally, students receive a personal account to log into the Achieve3000 program to practice independent reading at their own reading level.

4.4 Summary

Overall, Job Corps centers' use of technology resources in the context of remediation is varied. Only about half of centers report that they currently use computers/laptops for remediation. Additionally, while they use more than 20 software programs, the most prevalent, Khan Academy, is in use at just over half of centers that currently use TBL for remediation. No other program is in use at more than 30% of centers.

Centers' experience with features of software programs is also quite varied. The mix of software packages includes programs that enable instructors to track student progress, enable students to work at their own pace, and adapt to students' mastery of different topics. When implementing these technology-based learning resources, centers tend to use one of three instructional implementation strategies. Students are either placed in asynchronous, technology-centric computer programs; in synchronous traditional education environments with supplemental TBL resources; or synchronous traditional classroom instruction that is technology-centric.

¹³ While we observed SMART Boards present at all seven visited centers, in this section, we consider only those in which we observed them present and in use as a TBL resource.

5. Satisfaction and Perceived Effectiveness

After centers select a TBL resource and incorporate it into remedial instruction, they have the opportunity to assess their satisfaction with the resource. They may consider the extent to which the resource's features and functionality align with their expectations or whether it has proven sufficiently effective to justify the investment of time and money. In this chapter, we document the TBL resources most commonly used across the network of centers, as identified in the previous chapter, and explore centers' satisfaction with and perceptions of the effectiveness of TBL resources for remediation. In the next section, we begin by discussing what information centers consider when gauging the effectiveness of a TBL resource. The remaining three sections present findings from the survey and site visits related to effectiveness of and Job Corps students' and staff's satisfaction/dissatisfaction with TBL resources.

5.1 Definitions and Perceptions of Effectiveness

Job Corps administrators and instructors tend to take a holistic approach to assessing TBL's effectiveness. In both survey results and site visit interviews, they commonly define their perceptions of effectiveness based on formal testing results, informal feedback, and impressions from students and staff. The relative emphasis on formal versus informal definitions of effectiveness may differ across survey and site visit results, but overall, centers consider both sources important.

During nearly every site visit, staff defined the effectiveness of TBL in terms of increases on TABE scores or other assessments and quizzes.¹⁴ According to one academic instructor:

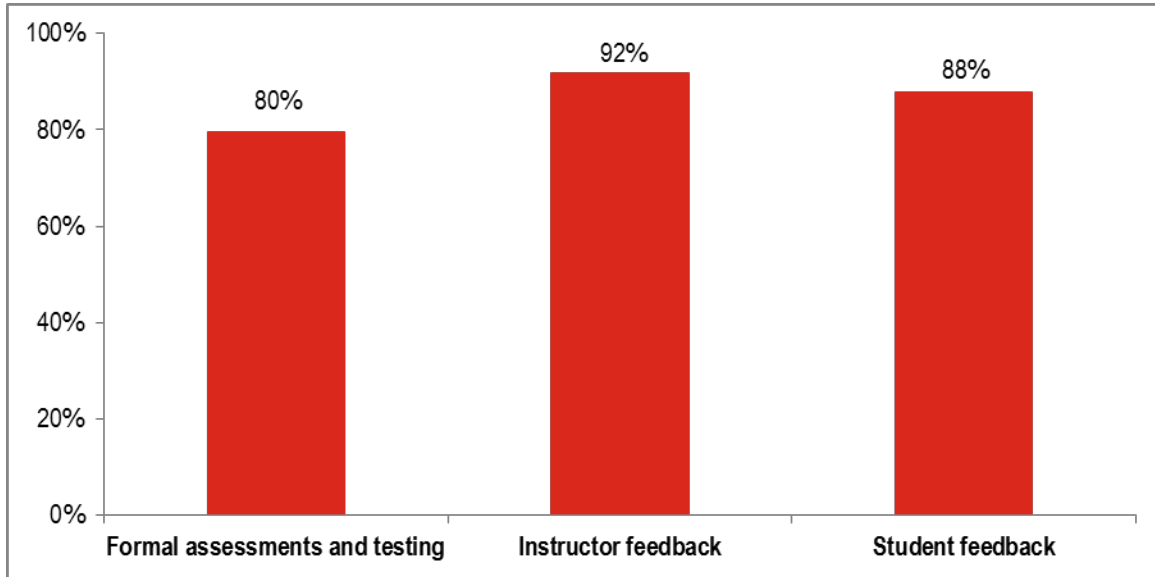
“Obviously if I see TABE scores going up, then that will tell me something is working, so it would have to be Khan Academy and READ Theory [that are driving improvement] because that’s what I’m using, not the worksheets or the board.”

Still, at about half of the visited centers, staff reported that student non-academic outcomes were equally if not more important in measuring TBL effectiveness. Student engagement, interest in learning, and motivation were all reported by administrators and instructors as critical in defining the effectiveness of TBL. For example, one academic manager reported, “If it got their interest [...] if it stimulates their interest and curiosity then it would be successful.”

The survey confirmed the importance of this dual emphasis. As Exhibit 9 shows, centers placed essentially equal emphasis on informal feedback from instructors and students. Eighty percent of centers report that they use formal assessments and testing to measure the effectiveness of TBL, and slightly larger shares relied on student and instructor feedback.

¹⁴ Note that staff rarely suggest that those sought after improvements ought to be compared to TABE scores among students in non-TBL courses, nonetheless, formal testing results are the outcome of choice when defining TBL effectiveness.

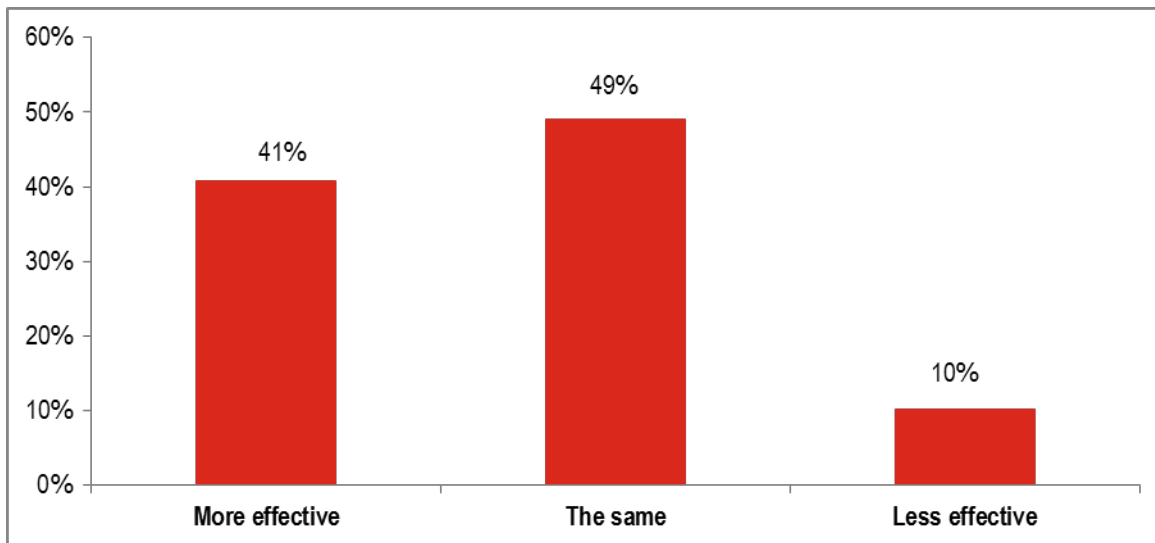
Exhibit 9: Determinants of TBL Effectiveness



n = 98 (current users of TBL for remediation).
Source: Abt Associates/MEF Survey of Job Corps.

Although centers were not asked to consider one approach to defining the effectiveness of a TBL resource, we asked respondents to compare TBL methods to other instructional methods. Surveys and interviews with Job Corps staff indicate that administrators and instructors usually consider TBL resources for reading and math remediation as effective as or more effective than other methods for instruction. Exhibit 10 illustrates that almost half of centers (49%) report that TBL resources for reading and math were as effective as other methods used for reading and math remediation. Another 40% of centers find TBL resources more effective.

Exhibit 10: Perceived Effectiveness of TBL Compared to Other Instructional Methods



n = 98 (current users of TBL for remediation).
Source: Abt Associates/MEF Survey of Job Corps Centers.

When asked during site visits, center staffers report similarly mixed perceptions of TBL's effectiveness. Staff in just over half (four out of seven) of centers indicated that TBL resources at their centers were more effective than traditional educational approaches. One center director reported that students were more engaged in classrooms using SMART Boards relative to those that did not. In another center, an academic instructor compared two reading classes:

"I know one reading teacher who does lower level reading, and he loves the reading software. He's seen the effectiveness. The other reading teacher doesn't use it all, and we don't see the same gains from students."

In two of the seven visited centers, staff reported that TBL resources were – at best – as effective as traditional instructional methods. One academic instructor said, "I think it helps [...], but at the end of the day, it's not above and beyond traditional lecture and pen-and-paper activities." An academic manager at another center felt that student learning gains would remain the same even if you took technology out of the classroom.

5.2 Satisfaction with TBL

In general, both Job Corps staff and students believed that technology-based resources had important benefits for teaching and student learning. Interviews with administrators and instructors focused on two main themes: 1) increased opportunities for individualized learning and flexibility in the classroom, and 2) higher levels of student engagement and participation. Student-level data were collected from 13 focus groups at seven Job Corps Centers with a total of 91 participating students.¹⁵ Students also reported on the benefits of the TBL, citing technology as engaging, accessible and effective for learning.

5.2.1 Staff satisfaction with TBL

Job Corps staff at three out of seven centers described how TBL instructional resources provided them additional opportunities for individualized instruction and increased flexibility in the classroom. Staff members found that they were better able to support students across a broad range of skills and abilities. For example, one instructor indicated that TBL was a useful tool in working with ESL students who required additional attention: "I don't feel helpless when I'm teaching kids that are from a foreign country. Because it can be individualized, I can teach any kid at any level."

Several instructors pointed out that Job Corps students are diverse in terms of their academic background and learning styles. In their view, TBL resources offer a kind of flexibility that accommodates the learning styles of different students. This capacity to personalize instruction in a relatively automated way was appealing to one instructor who reported that TBL enabled her to use time more efficiently in the

¹⁵ We conducted student focus groups more informally with a moderator facilitating a discussion with students at the Centers. In this format, we did not ask all student groups the same questions, and the discussions varied widely. As such, the data we present in this section are neither exhaustive nor mutually exclusive. For example, if students at four centers report that they are dissatisfied with TBL at their centers, this does not mean that students at the other three centers are satisfied, or that all students at these centers were dissatisfied with TBL. The data presented are simply an aggregate of the most common themes that surface through these informal discussions.

classroom. By allowing some students to work on computers, she can provide one-on-one instruction for other students who require additional attention.

Academic managers and instructors at two centers also reported higher levels of engagement and participation when they used TBL resources in class. One academic manager observed that student involvement was higher in classrooms using SMART Boards. In these classes, students enjoyed going to the board and solving math problems with their peers. In one math class observed during a site visit, the teacher projected a math word problem on the SMART Board and allowed the students to work together in groups to solve the problem. In our judgment, this class appeared more engaged and motivated compared with another remedial class at the same center that relied on a more traditional, lecture-based format.

5.2.2 Student satisfaction with TBL

Similar to the administrators' and instructors' feedback, many of the students in the focus groups reported several positive benefits when using TBL resources at their centers. Students at six out of seven centers described TBL as an effective learning tool for reading and math remediation and beyond. For example, students reported that TBL approaches were helpful for breaking down difficult concepts and raising their test scores, while others reported higher levels of motivation using apps and online modules.

Additionally, students at five centers reported that TBL resources were more user-friendly and engaging compared with more traditional classroom or paper-and-pencil learning approaches. These students felt that TBL resources in their centers catered to their learning style. These students reported that they became easily distracted and bored in traditional classroom settings and found TBL to be more accommodating to different learning styles.

"I think technology is good if you're a visual learner. When you're using a book you can see images but technology allows you to see videos. I can scroll down, I can highlight stuff and save it to my notes. I get tired when I read from a book."

–Job Corps student, 2018

In two centers, students identified the capacity for mobile technologies in particular to stimulate engagement through competitive games and quizzes in which students race to respond to questions posed to the entire class using mobile applications downloaded to cell phones or other devices. Multiple students found that, through these game-based approaches to interaction, they enjoyed their classes and the associated subject matter more. For some students, the competition helps them want to learn.

Moreover, students at five Centers reported that online courses gave them more options to learn independently outside of classroom hours, a benefit not offered by traditional instruction at their centers. In one focus group, several students described how they watch educational videos in their dorms and use websites such as CoolMath and Kahn Academy to help with homework. According to these students, these videos help them better understand material they were not able to comprehend in class.

While the majority of students focused on the benefits of TBL, not all students agreed. One student at each Job Corps Center who participated in focus groups reported that they preferred traditional learning approaches to TBL. These students described how self-directed TBL tools with limited or no teacher interaction left them feeling like they lacked necessary attention from an instructor. As a result, they may not remain on task as consistently.

5.3 Dissatisfaction with TBL

Despite the benefits of technology-based resources, staff and students were dissatisfied with the quality and availability of technological equipment. Staff at four centers complained about the quality of computers, SMART Boards, and software available for academic remediation; only two of the interviewed academic instructors were satisfied with the quality of TBL resources at their center. For example, one program director rated his satisfaction with TBL resources at his center as five on a scale from one to 10, noting that his SMART Board did not have software or speakers. One academic manager at another center rated his satisfaction as two, saying that TBL implementation was more of an “afterthought” at the Job Corps Center as opposed to central to the vision and goals of the Center’s academic program.

Similarly, students at six out seven Job Corps Centers complained about the quality of computers; only a handful of students at two centers were satisfied with the current use of TBL. For example, students reported that computers regularly broke down (five Job Corps Centers) or were too slow (three Job Corps Centers). Wi-Fi was another area of student concern. The majority of students (five of seven Job Corps Centers) reported that the Wi-Fi was too slow, not available in certain parts of the building, or restricted during certain times of the day. Additionally, students at four of seven Job Corps Centers were dissatisfied with the restrictions on internet use. Students expressed frustration for being reprimanded for using software programs such as Khan Academy on their own time. Some students even reported that the internet restrictions made them feel disconnected from the outside world.

5.4 Summary

The findings presented in this section show that students and staff believe that TBL resources have important implications for teaching and learning. Nearly all centers report that TBL instructional methods are equally or more effective than traditional instruction without TBL resources. Among the benefits of TBL instruction, administrators and instructors found that TBL resources enabled them to individualize instruction to meet the needs of a broader range of students effectively. In addition, a majority of students reported higher levels of engagement in classrooms using technology. This isn’t to say that students and staff don’t also encounter challenges with use of TBL in Job Corps. We discuss these challenges in the next two chapters.

6. Challenges: Instructional Environment

The sixth research question listed at the outset of this report considers the extent to which technological literacy poses a challenge to use of TBL among Job Corps staff and students. Based on our preparatory work and initial site visits, we determined that there were several other challenges in need of exploration. Therefore, in addition to technological literacy, this section discusses all of the instructor- and student-level challenges centers face in expanding the use of TBL to support remedial education. The perspectives here, based on survey responses and qualitative data from site visits, underscore the challenges related to instructors' and students' technological literacy and willingness to implement TBL.

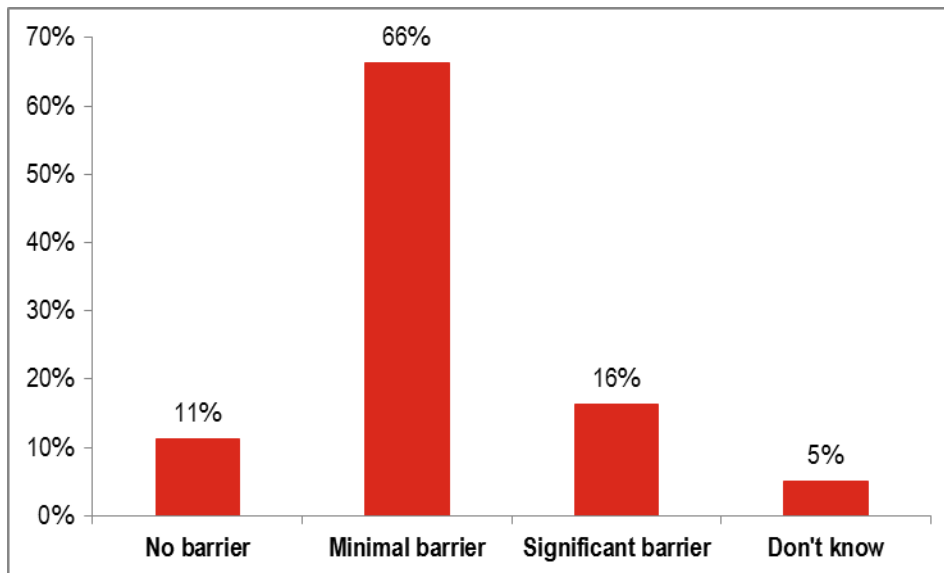
6.1 Instructor-level Challenges

Remedial education instructors in Job Corps centers come from diverse educational backgrounds, such as working as teachers in traditional public schools, special education, or adult basic education. Despite their prior experience, they face the challenge at Job Corps of working with a group of students who have often struggled in traditional educational environments and who need substantial remediation once they start at a center to prepare them for their Career Technical Training (CTT) courses of study. While center leadership and instructors regularly acknowledge the potential opportunity of TBL to support remedial education in Job Corps, survey data and site visits underscore the instructor-level challenges that exist.

6.1.1 Tech Literacy

Survey results suggest that instructors' technological literacy typically presents only a minimal barrier to more extensive use of TBL. Among a small portion of centers, however, directors acknowledge that instructors' technological literacy poses a significant barrier. As seen in Exhibit 11, 16% of centers who report currently using TBL indicate that instructors' technological literacy represents a significant barrier to use of TBL for remediation, 66% state that it poses at least a minimal barrier and only 11% say that it is not a barrier.

Exhibit 11: Instructors' Technological Literacy as a Barrier to Use of TBL (% of centers)



n = 98 (current users of TBL for remediation).
 Source: Abt Associates/MEF Survey of Job Corps.

During site visits, administrators offered mixed assessments on the technological literacy of instructors. Most were able to identify a subset of their instructors that had strong skills and were adept at implementing TBL approaches to remediation. However, they noted that this was not universally the case. Often there were multiple instructors who had more limited technological literacy. When offering assessments of instructors' level of technological literacy, almost all academic managers indicated a range. As one put it, "We have some [instructors] who can code and some that don't even have a cell phone."

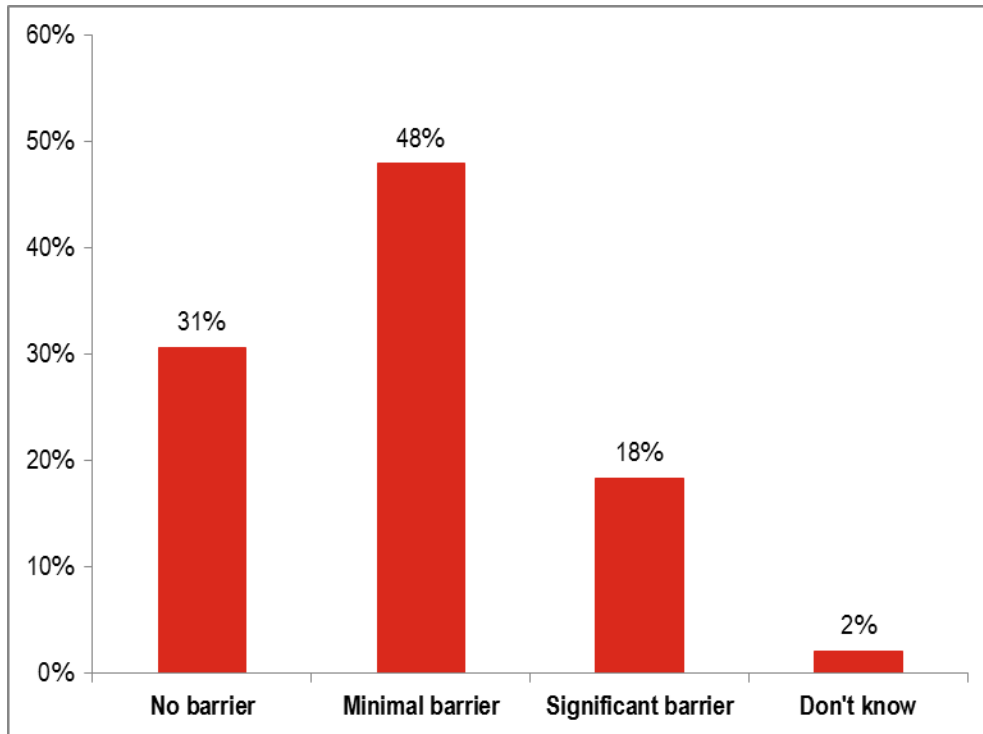
In many cases, instructors' general technological literacy seems to pose less of an issue than their capacity to use a particular TBL tool, one that may present unique or unfamiliar challenges. As indicated earlier in the report, there has been a concerted effort at centers to use SMART Boards in classroom instruction. Our site visits suggested that there is often limited familiarity among instructors with the functionality of this tool. Conversations with administrators and instructors, supplemented with classroom observations, indicated that many instructors had only limited knowledge of how to use the boards. Often instructors used them primarily as projectors without taking advantage of the more interactive features available. While this does not necessarily reflect an overall limitation to technological literacy, it does underscore challenges facing centers when they roll out software or hardware systems with specific user protocols.

More generally, multiple academic managers emphasized the need for more consistent professional development for instructors to build and maintain skills in using technology in the classroom. Noting the limited funds available to support training, one instructor indicated, "I think you have a lack of training for instructors. People are going to do what they are comfortable with and if we don't challenge them...[they] are not learning." While the focus of this professional development is typically on the use of specified tools, leadership emphasized that increased investments in professional development lead to overall improvements in skill level and the ability to use more advanced educational approaches. Centers may be more inclined to invest in TBL-specific training if these spill-over effects improve instruction at the center more generally.

6.1.2 Willingness

Survey results suggest that instructor interest usually poses either minimal or no barrier to more extensive use of TBL for remediation. However, like technological literacy, instructor interest can pose a significant barrier among a small portion of centers. As seen in Exhibit 12, almost half of the centers who report currently using TBL indicated that instructor interest represents a minimal barrier; 31% state that interest is not a barrier at all, and another 18% say that it is a substantial barrier.

Exhibit 12: Instructors' Interest in Using TBL as a Barrier to Use of TBL (% of centers)



n = 98 (current users of TBL for remediation).

Source: Abt Associates/MEF Survey of Job Corps.

Conversations during site visits indicated that instructors were generally willing to try to use new TBL tools to support remediation. While instructors occasionally expressed skepticism about the utility of these tools, this skepticism did not generally appear to translate into resistance to implementation. However, instructors' willingness to use TBL is not universal. In at least one center, an academic manager reported more active resistance on the part of instructors, which posed a barrier to TBL use. The manager noted, "I think that there are probably two [instructors] that would resign if we started using more technology. The concept of having to learn [new technology] wouldn't be worth it to them. The rest would fight it tooth and nail, and then a couple of them would run with it."

While instructors' resistance to using more TBL is sometimes tied to instructors' age, based on our site visit conversations, this doesn't appear to be the case. Most administrators interviewed did not suggest any connection between instructor age and willingness to implement TBL. One academic manager noted, "While we [the basic education staff] are all older, they are teachers and I am pro-teacher and they will try anything because that is the nature of a teacher. If you take the time to show us how to use it, we will." Another academic manager emphasized seeing unexpected willingness and capacity among instructors: "Sometimes [instructors] use TBL in ways that I wasn't expecting and they'll come to me with suggestions. The creativity of staff is a real strength." Moreover, one academic manager emphasized that instructor enthusiasm to use TBL increased when they saw their peers experiencing success with new tools, thereby increasing their willingness to try new TBL tools.

Several managers felt that lack of adequate resources (e.g., hardware and software) and the inconsistent functionality of technology dampened instructor enthusiasm. As discussed in Section 7, some Centers experience issues with intermittent internet access or outdated hardware. In addition to affecting the ability to

use TBL, this inconsistency makes instructors less willing to invest time and effort into integrating TBL into their lesson planning. As one academic manager noted, “When the computers are up and running, everybody’s on board. However, the system goes down all the time, so the instructors need a back-up plan. It’s things like that that make them resist.”

Additionally, some managers suggested that instructor enthusiasm for using TBL was dampened because students do not always use the tools correctly. Most often, managers cite frustration with students who spent their time at individual work stations browsing the internet and using computers for non-academic pursuits during class time, a pattern confirmed during classroom observations by site visitors.

6.1.3 Other Challenges

Both instructors and academic managers noted that an impediment to consistent use of technology is faulty hardware. When hardware does not work correctly, it results in delays in class instruction. This reduces instructor enthusiasm for ongoing integration of these tools into the curriculum. It also makes it harder for instructors to build and maintain the familiarity with the tools required to use them effectively in an instructional environment. This was especially challenging for use of SMART Boards. During interviews, Job Corps administrators reported that center information technology (IT) staff cannot service SMART Boards on their own without submitting a request for assistance from a vendor.

Several academic managers indicated that staff turnover is an impediment to consistent use of TBL. When centers purchase new software or hardware, the vendor typically provides in-depth training to support implementation. Instructors who received this training generally indicated that it provided a good foundation for using the tools. However, academic managers noted that newer instructors who did not receive the initial training often had few supports and were more likely to struggle in using the technology as intended or to its full capacity. In these cases, instructors must rely on their peers for support, and conversations with instructors suggest that this exists to varying degrees in the centers.

Leadership at one center indicated that the limited opportunity for professional development and course planning posed challenges for both academic managers and instructors in thinking creatively about how to use TBL. The director emphasized that a lack of planning time combined with the constant influx of new students with multiple educational barriers left little time for creative thinking about how to use TBL in remedial education.

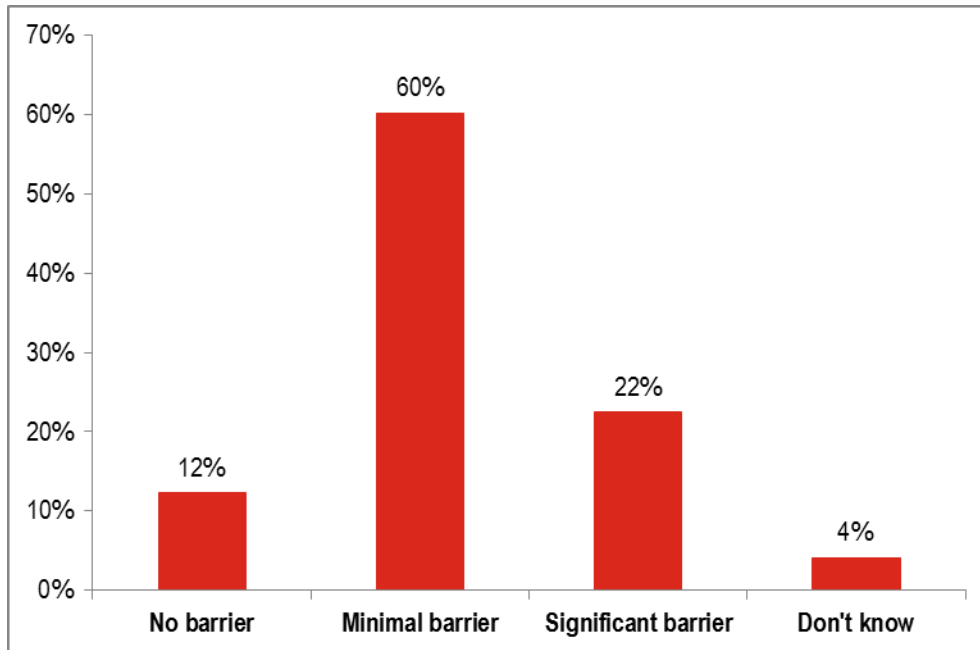
6.2 Student-level Challenges

This section discusses student-level challenges with use of TBL in remediation. In addition to survey results, it is based on conversations with center staff, focus groups with students, and classroom observation. It focuses on the varied levels of students’ technological literacy, willingness to use TBL, and the extent to which academic skills pose a barrier to implementation.

6.2.1 Tech Literacy

The majority (60%) of centers currently using TBL indicate by their survey responses that students’ technological literacy poses only a minimal barrier to more extensive use of TBL for remediation. However, only 12% of centers say that it is not a barrier at all, whereas a notable share (22%) reports that this is a significant barrier.

Exhibit 13: Students' Technological Literacy as a Barrier to Use of TBL (% of centers)



n = 98 (current users of TBL for remediation).
 Source: Abt Associates/MEF Survey of Job Corps.

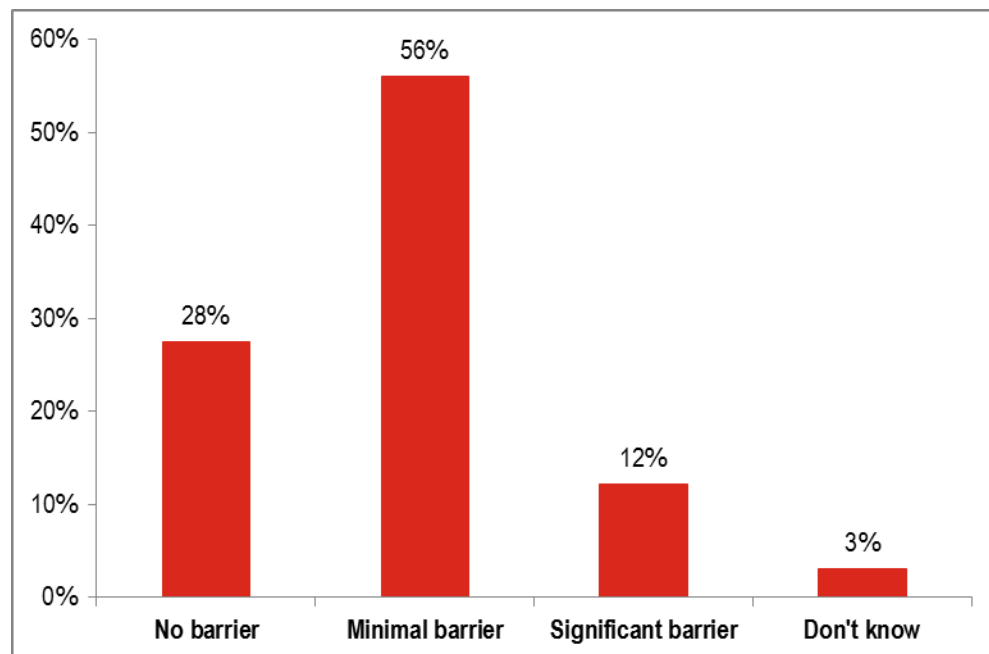
Conversations during site visits reinforced the varied assessments in the survey regarding the challenge technological literacy poses. Generally, staff felt that students either had adequate skills to use available technology or the capacity to learn quickly the required skills. Staff also believed that students' technological literacy was not a primary barrier to use of TBL. However, most staff noted that a subset of their students comes to the center lacking the rudimentary skills to be successful when using technology in an academic setting. One academic manager estimated that roughly one third of new students lacked the basic computer skills to take full advantage of available TBL tools in the center's remedial program. While in the minority, several students in the focus groups acknowledged limited technological literacy and preferred more traditional learning and instructional methods.

When discussing technological literacy, staff often differentiated between the use of technology in students' personal lives and the technological focus in the academic setting. Center staff members regularly emphasized how common smartphone ownership is among students. They noted that almost all students have smartphones and are adept at using mobile technology. However, they emphasized that these skills do not always translate into the ability to use technology on desktop computers. As one academic manager put it, "I don't think they [students] are comfortable using technology as an educational tool, even though they're comfortable using it as a social tool."

6.2.2 Willingness

Results from the survey suggest that student interest typically poses either a minimal or no barrier to more extensive use of TBL in some centers. As seen in Exhibit 14, 28% of centers currently using TBL responded that student interest was not a barrier, 56% indicated it was a minimal barrier, and 12% indicated that it was a significant barrier.

Exhibit 14: Students' Interest in Using TBL as a Barrier to Use of TBL (% of centers)



n = 98 (current users of TBL for remediation).
Source: Abt Associates/MEF Survey of Job Corps.

Focus groups with students revealed an array of perspectives regarding their openness to use of TBL in remedial classes. Some students expressed frustration at having primarily computer-based instruction. They were concurrently taking on-line classes to support high school completion, so they preferred more traditional, instructor-led classes to create more variety in instructional settings. Others appreciated the opportunity to pursue academics at their own pace and to escape the potential distraction that their peers pose in a more traditional classroom setting.

Multiple students expressed frustration with the restrictions placed on technology at the centers and the way in which restrictions inhibited their ability to engage with TBL tools. They cited issues such as inability to access certain websites (e.g., Khan Academy, instructional videos on YouTube), difficulty printing, lack of sound on computers, limited Wi-Fi access, and multiple log-ins to access a program. All of these described challenges reduced their enthusiasm for using TBL for remediation.

Many students complained about overly restrictive policies on smartphone use. They indicated that they wanted more freedom to use their phones for tasks such as translation, a calculator, or listening to music to avoid distractions from other students. However, many also acknowledged that their peers did not use their devices responsibly, texting or checking social media sites during class. To varying degrees, they were understanding of the reasons for these restrictions.

Echoing concerns from instructors about the lack of reliability with technology at centers, students noted that if classes are overly reliant on technology, it is more disruptive when the technology does not work due to poor internet connectivity or software and hardware issues. This reduced student enthusiasm for any increased use of technology for academic instruction.

As with students, instructor perspectives varied regarding student enthusiasm for increased use of TBL for remediation. While few staff identified opposition to use of technology among students, instructors did

indicate that concerns regarding consistent reliability of technology reduced student willingness to engage with TBL in remedial classes.

6.2.3 Academic Skills

Center staff members did not typically raise students' academic skills as a barrier to technology usage. However, leadership at several centers suggested that learning disabilities made it difficult for students to succeed in remedial classes that were overly reliant on technology. One instructor provided the examples of students who use a "word block" to read one word at a time, covering up the rest of the sentence, and the difficulty in implementing this approach if the student is reading a computer screen. Similarly, instructors suggested that students diagnosed with attention-deficit/hyperactivity disorder often do better with printed materials that are less distracting compared with computer screens.

One instructor emphasized that student learning styles often required a more hands-on approach than TBL tools allow. For example, it is easier to sit down and work through a pen-and-pencil math problem as opposed to explaining the mechanics of the problem as it appears on a screen. Leadership at one center suggested that the variation in students' academic skill level and low overall academic skills made use of TBL challenging. Speaking about self-paced options, the director noted that most students "are dependent learners, but the [Job Corps] system is designed for independent learners."

One academic manager felt that the higher-level students in remedial classes were most likely to benefit from TBL approaches. These students had the baseline math and literacy levels to benefit from the self-paced independent programs, especially those that give them positive reinforcement (e.g., badges and icons) for completion of modules and lessons.

6.2.4 Other Challenges

In addition to the challenges that student capacity and enthusiasm pose for using technology, the site visits revealed varying perspectives regarding the role that technology plays in centers more generally. Several instructors indicated that many of their students struggle with staying focused in class. They felt students were easily distracted, and greater use of technology increased this distraction. As noted in the previous section, students were regularly on their phones or browsing non-academic websites during classroom observations, and multiple instructors emphasized that students' propensity for distraction posed a challenge for use of TBL in remedial classes. Instructors noted that, even among those that were using the programs, there was often limited student engagement, with students clicking through screens and modules without taking the time to internalize or engage with the content.

More generally, instructors had mixed feelings regarding the ubiquity of smartphones on campus. Some pointed to student engagement with smartphones as an indication of openness to technology in the academic setting. They suggested that centers loosen restrictions on use of these devices in the academic setting. Conversely, some staff felt that, by virtue of their smartphone use, students have come to see technology as primarily for entertainment, making it more difficult for instructors to recast it as an educational tool.

6.3 Summary

In summary, several themes emerge when reviewing the quantitative and qualitative data related to the instructor- and student-level challenges to implementing TBL. Technological literacy of instructors and students is not typically a challenge, but it represents a barrier for a subset of both groups. While instructors and students might benefit from increased training related to the use of TBL products, there is generally a

baseline level of competency that enables use of TBL materials. However, in both groups there is a smaller subset that lacks the core computer and technological skills. Among instructors, this group is relatively small and more likely to be older. Among students, this is a group that, even if adept at using smartphones, has less experience with desktop computers.

Center capacity influences student and instructor willingness to use TBL. Both students and instructors indicated that they would be more enthusiastic about increased TBL use if they were more confident that there would not be persistent hardware, software, and connectivity issues. The lack of trust in the stability of these systems left them reluctant to become overly reliant on TBL.

Finally, the potential for technology to increase student distractibility reduces instructor willingness to use TBL. While some of these issues are traditional behavior concerns that any teacher might face, many were adamant that the presence of technology exacerbates the problem. They noted that students often struggle to remain on task when working independently at computers, either failing to engage fully with the course material or using the computers for non-academic pursuits.

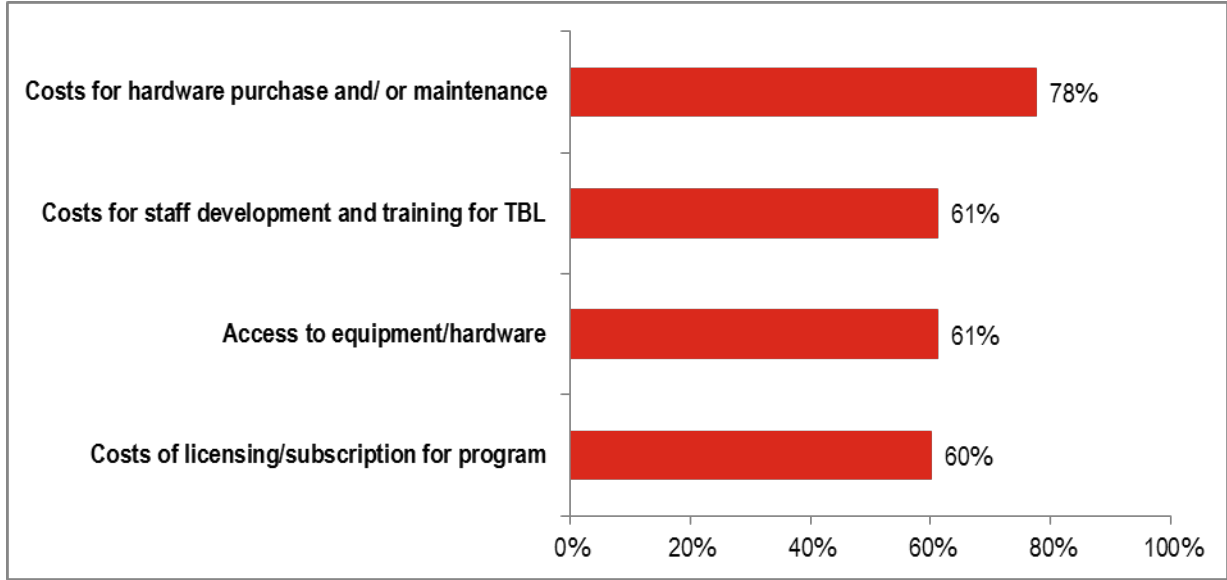
7. Challenges: Center Capacity

Effective TBL utilization requires access to digital learning tools and hardware that function properly, are up-to-date, and are well-maintained for student and instructor use. Centers with insufficient access to functional hardware, networks, and other capacity-related resources are limited in the types of TBL instruction they can implement and may ultimately be unable to support TBL as an instructional approach. This section presents information on the primary capacity-related barriers that centers experienced in the provision of TBL resources for academic remediation. We organized the following text by the barriers identified in various interviews. These barriers included the costs associated with implementing TBL, access to necessary hardware and software, functionality of existing technological equipment, reliability and bandwidth of Wi-Fi, security restrictions on internet usage, and IT support to troubleshoot challenges with hardware and software.

7.1 Cost

The cost associated with technology use is the most significant barrier that centers face in academic remediation. Exhibit 15 shows the top four factors that centers identified as significant barriers to more extensive use of technology for remediation.¹⁶ Almost 80% of centers reported that costs for purchasing and maintaining hardware were a significant barrier. Additionally, at least 60% of centers reported costs for staff development and training for TBL, and costs of licensing/subscription for programs were significant barriers to more extensive use of TBL for remediation.

Exhibit 15: Top Four Barriers to more extensive use of TBL for remediation



n = 98 (current users of TBL for remediation).
Source: Abt Associates/MEF Survey of Job Corps.

¹⁶ A total of 13 factors were cited as capacity-related barriers to more extensive use of technology for remediation. The complete list of response options is available in Appendix C.

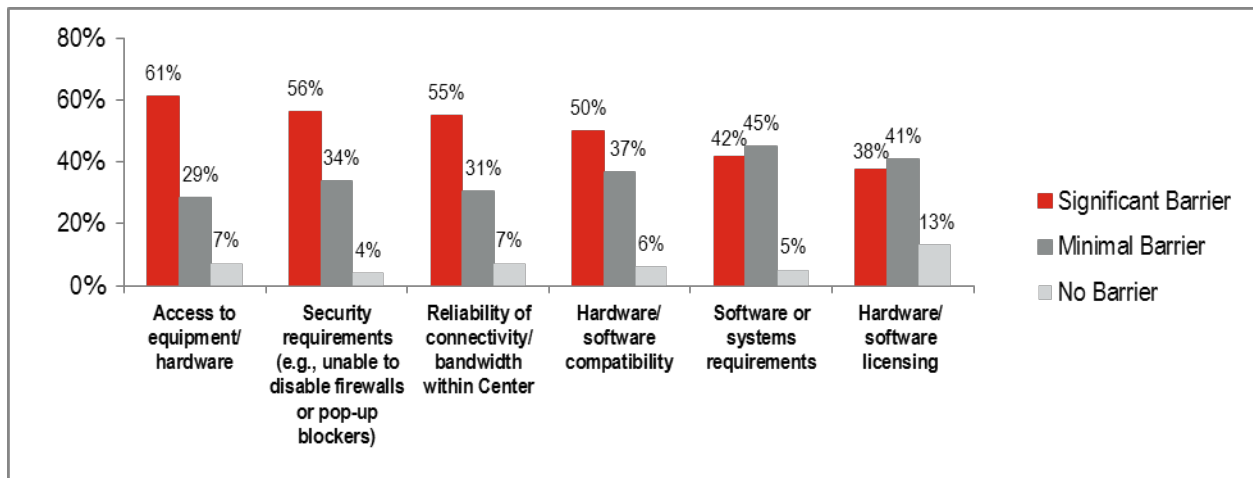
Site-visit findings corroborate this feedback, with respondents from all seven centers citing funding as a challenge for implementing TBL in reading and math remediation. Job Corps staff at all levels, from center directors to instructors, described how funding to purchase technological equipment and software had declined in the past few years. For example, two centers had to cut their subscriptions to TBL software because they no longer had the budget to support it. Another center considered purchasing software licenses for READ180, a software program for reading remediation, but decided against it due to a lack of funding. Moreover, directors at two centers explained how they operate in a fiscal survival mode. Reduced funding forces them to focus their attention on maintaining center operations. As a result, they are unable to devote adequate time and resources for integrating TBL in learning curricula or plan to expand TBL use for remediation.

Job Corps administrators and instructors were confused about funding allocations for TBL resources. Administrators at three centers reported that they did not understand why some TBL resources had priority over others. For example, portable hardware equipment such as laptops, iPads, or tablets are rarely allocated for student use. One center director explained that they received computers from the national office as opposed to the requested laptops the center actually needed. To circumvent these challenges, two out of seven centers used innovation funds: a funding source the Job Corps National Office offered to help centers with making technology improvements and meeting other requests. This funding stream enables centers to avoid the typical channels to get approval for acquiring technological equipment, and these two centers find that this is more responsive to their current needs.

7.2 Technological Infrastructure

Along with costs, centers reported that other significant barriers included hardware access, Wi-Fi bandwidth and connectivity, and compatibility of hardware and software. Exhibit 16 shows the percentage of centers reporting technological factors as barriers to more extensive use of TBL. More than half of all centers (61%) reported that access to hardware and equipment was a significant barrier to more extensive TBL use for remediation, followed by reliable connectivity or bandwidth at the center (56%) and hardware and software compatibility (50%). Software and systems requirements, and hardware and software licensing, respectively, were reported as less significant barriers to extensive technology use for remediation.

Exhibit 16: Technological Factors Reported as Barriers to Extended TBL Use for Remediation



n = 98 (current users of TBL for remediation).
 Source: Abt Associates/MEF Survey of Job Corps.

7.2.1 Access to functional equipment and hardware

Staff at all seven visited centers reported not having enough equipment to ensure the best use of TBL for remediation. Instructors at four out of seven centers complained that there were not enough smartboards and computers. For example, administrators at one center reported that smartboards constantly moved from classroom to classroom to maximize their availability. Similarly, administrators at another center assigned smartboards to teachers, leaving some constantly without smartboards in classrooms.

Administrators and instructors focused on the functionality of the equipment available at their centers as a significant barrier to more extensive TBL use for remediation. Staff in four centers complained that computers do not work or frequently broke down. Moreover, both students and instructors commented that the computers were very slow. In one interview, an administrator explained that it takes her 30 minutes every morning to log into her computer.

"The smartboards move everywhere. There are three smartboards in the school. Situations like who has a smartboard can be issues when they don't have to be ... It needs to be organized, and put in place, and we need the funds to do that ... We lack a lot of equipment.

–Job Corps staff person, 2018

7.2.2 Poor connectivity and bandwidth

Centers also defined internet connectivity and bandwidth as significant barriers to effective TBL implementation. More than half of all centers surveyed (55%) reported challenges of limited internet connectivity. Moreover, staff at all seven centers reported challenges related to bandwidth and connectivity.

Both staff and students complained of issues of limited bandwidth. For example, instructors and administrators at three centers described how the internet slows down if more people log into the system. One center reported having no Wi-Fi access at all. Students and instructors at three other centers reported that the Wi-Fi access was available only in certain parts of the building and at certain times of the day; only three staff members out of 36 total at all seven centers were satisfied with the internet connectivity at their centers.

7.2.3 Lack of access to software

Additionally, almost half of all centers (46%) reported that access to software was a significant barrier. This was reflected in the site visits and the findings discussed in Section 7.1, in which 60% of centers report that the cost of purchasing software was a barrier to using TBL for remediation. For example, one academic manager explained that budget cuts prevented her from permanently adding READ180, a new software program, to the center's reading curriculum.

"If you want licenses, there's a cost to it. There is a TABE practice test that we would like, Read180, that was a reading program that the national office piloted and it was wonderful, and then money got cut."

7.3 Security Restrictions

A little more than half of all centers surveyed (56%) identified security requirements as a challenge. The site visits corroborated these findings. Staff and students at six of the seven sites reported security restrictions as a primary challenge they face for effective use of TBL. Instructors at four out of seven

centers reported they were unable to access educational YouTube videos or lessons from Kahn Academy. One administrator explained,

“We are severely limited on the websites that we can use. YouTube Ed is not allowed, sometimes Kahn Academy isn’t allowed. Sometimes Penn Foster has videos in it, and when the students click on them they’re blocked. My instructors would love to show YouTube and Kahn Academy videos but they can’t.”

As a workaround, several instructors used their phones and personal data plans to show videos to the class. Like instructors, students in the student focus groups reported the restrictions were a significant impediment to their learning. One student said, “It’s like you can’t use a computer at all.”

To remove security restrictions, Job Corps instructors must submit all software requests to the national data center, which processes and decides on the requests. Instructors interviewed expressed frustration with the responsiveness of the data center, often claiming that it takes days to have a request processed. For instructors, the length of time to process a request makes it challenging to add a video spontaneously into a lesson plan.

Interviews with IT staff offer a different perspective. Familiar with the request process, IT staff reported that the data center was responsive to requests. According to one IT staff member, the data center had never turned down a request to allow access to certain websites. She went on to discuss how instructors at the center stopped making these requests over time. These findings point to a particular dynamic: the length of time that it takes the data center to process requests is incompatible with the short timeline in which instructors plan their lessons and the desire to pull up videos and other e-learning opportunities spontaneously in their classes. As a result, the process discourages instructors and they stop making requests.

7.4 IT Support

Generally, centers reported high levels of satisfaction with IT support. Less than 20% reported that the IT department or help desk was a significant barrier to more extensive TBL use for remediation. Staff expressed appreciation for the IT staff person at their center (there was one at most of the seven centers we visited). But interviews with administrators and instructors at the seven centers described a more nuanced picture of IT support. Administrators and instructors at four out of seven centers agreed that one IT person was not enough to keep everything running smoothly. Often, IT staff members were overworked. As a result, requests to fix equipment or software take days to process. In one center, administrators used students in the IT trade to help fix minor computer problems at the center. This strategy enabled the IT director to fix problems in a timely manner and gave students additional opportunities for more applied learning.

"We don't have the IT support we need. We have one person who is as overworked as a fry cook at McDonalds during lunch time and the drive thru person called in sick. She is doing everything, and is in charge of dorms, recreation and instruction."

–Job Corps administrator, 2018

IT support for SMART Boards is challenging. Unlike computers, which are generally fixed at the center, IT support for SMART Boards is done by Smart Technologies, the company that manufactures them. Staff reported frustration with this process since these requests take longer than usual to fix. Observations of reading and math classrooms in these centers demonstrate that SMART Boards often sit unused in the front of the classroom, or are used solely as a projector.

7.5 Summary

Job Corps centers face significant obstacles to using TBL for academic remediation. The most significant are cost-related. This includes the cost of acquiring hardware, training staff, and obtaining software licenses. These cost-related barriers prevent centers from using TBL resources extensively for reading and math remediation. Centers also consistently identify several concerns related to their ability to use the internet for instructional purposes. Some of these concerns are capacity-related. About half of centers report that the reliability of their internet connection and the bandwidth are significant barriers to TBL use. Likewise, about half report that internet access restrictions significantly limited instructors' abilities to use the internet for instructional purposes.

While centers must sometimes implement creative approaches to address these challenges – such as using students' IT skills or alternative access to instructional videos – centers consistently report high levels of satisfaction with designated IT support at their center. This was particularly true during site visit interviews with center staff. However, some centers report that a single IT support staff person is insufficient.

8. Key Findings and Recommendations

In this report, we have documented the current use of TBL in the context of remedial education in Job Corps. In the sections below, we summarize the results of our analysis of survey and site visit data and discuss the key findings as they relate to each of our research questions. We consider the extent to which those findings have implications for Job Corps, particularly with regard to challenges to expanded use of TBL. For each challenge, we reviewed the extant literature to identify best practices and evidence from the field in order to make recommendations for Job Corps National Office and local centers to consider when implementing TBL solutions.

8.1 Key Findings

Most Job Corps centers are currently using TBL resources in some capacity in the context of remedial education. Of our 115 respondents, 99 (86%) report that they currently use TBL. The majority of centers (64%) also report that they have some plan to expand their use of TBL for the purposes of academic remediation, but in many instances these are informally stated intentions, and it's unclear to what extent these plans have been fully developed or prepared for implementation.

When selecting TBL resources, the decision-making process is typically handled internally at the center, driven by either the preferences of the academic manager or a "bottom-up" process based on instructors' preferences. When considering different factors that inform the selection of a TBL resource, a majority of centers cite two in particular, cost and compatibility with existing technology infrastructure. Other factors include perceptions of the student's ability to use the resource, its demonstrated effectiveness, and its alignment with students' skill levels. These, however, are all secondary factors relative to cost and compatibility issues.

While the use of TBL for remediation is widespread across Job Corps centers (86 percent), the list of software resources currently in use is quite diverse, and centers' approaches to implementation vary. Particularly noteworthy is that fact that only one software program is currently in use at a majority of those centers: Khan Academy (53%). No other program is in use at more than 30 percent of centers, and ten other programs are used by at least five percent of current-use centers.

Centers that currently use TBL for remediation tend to find that it's either as effective as or more effective than traditional instructional methods. About forty percent found it more effective, while about half found it equally effective. Only ten percent of centers currently using TBL report that they find it less effective than other instructional methods. Staff and students shared mixed opinions of TBL resources when interviewed during the study team's site visits. Most opinions of TBL were positive. Instructors appreciate the extent to which some TBL resources can facilitate personalized instruction and allow for flexibility in the classroom to provide one-on-one attention to students in need of instructional assistance. Likewise, many students find that TBL can be more engaging, particularly when it involves more competitive learning games, and allows them to work at their own pace. For students who are motivated to pass their TABE requirements and focus their attention on their career and technical education, TBL instruction may enable them to finish quicker than they would otherwise in a traditional classroom environment. Still, at each center, at least one student reported that they preferred traditional classroom environments, often because they felt that TBL instruction was isolating and unfamiliar, given their background in traditional educational environments.

Implementation of TBL resources comes with many challenges for both staff and students, some of which are generally applicable to all, while others may be important for a smaller share of individuals for whom the challenge poses significant barriers. Of particular concern to the Job Corps National Office are those challenges associated with instructors' and students' technological literacy, meaning their capability to effectively utilize TBL resources. While the survey results suggest centers perceive that technological literacy is, at worst, a minimal barrier for students and instructors, there is a small but consequential subset of centers, instructors, and students for whom technological literacy poses a significant barrier to expansion of TBL resources. During our site visits, we observed several instances in which instructors struggled to properly use certain TBL tools, and likely could have benefitted from additional training on using TBL resources.

Despite any struggles with using technology for education, centers report that instructors and students are generally willing to make use of TBL resources. Still, instructors and students report that a lack of reliability and stability of IT systems on center affects their willingness to use those resources. Also, to the extent that students are more easily distracted in a TBL environment, some instructors are more resistant to expanded use of technology for learning, particularly for independent, asynchronous study.

Considerably more challenging than these student or instructor issues are the institutional and capacity challenges facing many centers. Most centers report significant barriers associated with the cost to purchase equipment, security requirements associated with using software, reliability of internet connectivity and bandwidth, and compatibility between existing hardware and software resources. In interviews, instructional staff often point to non-working computers and SMART Boards as examples of existing hardware that are not being used to their full advantage. Instructors often wish that they had easier access to certain websites in order to show instructional videos in class. In general, centers struggle to manage the IT infrastructure on center, and those centers with designated IT support staff or administrators report much appreciation for those individuals.

In summary, nearly all centers use some form of TBL hardware resources and software programs for remediation. Centers use a wide variety of technology-based programs, and they incorporate those tools into the classroom in different ways. Center-level decision makers, including leadership and instructors, drive the selection process for new TBL resources. While centers surveyed and staff interviewed report that they are generally satisfied with their use of TBL, they face some significant challenges, particularly related to cost of new resources, compatibility with existing center technologies, internet connectivity, network security restrictions, and (among a minority of instructors) capacity to effectively use TBL resources. Nonetheless, given the instructional setting for remediation in Job Corps, offering students an opportunity for independent learning makes a lot of sense. In the section below, we include lessons learned that could help Job Corps realize the full potential for TBL in remedial education.

8.2 Lessons Learned

We identified several challenges to the expanded use of TBL in Job Corps in the chapters above. To some extent, these challenges are not unique to the Job Corps experience of using TBL resources. Therefore, we can draw on related research and analyses to identify potential strategies to address these challenges. We summarize each of those challenges and the associated recommendations in the sections below, drawing on research literature where applicable.

8.2.1 Diverse skills and background of incoming students

Throughout the report, we have noted that a fundamental challenge to remedial instruction in general in Job Corps stems from the fact that students enter the program on a rolling basis and with a diverse set of skills and educational backgrounds. Job Corps is not the only educational setting in which students with mixed abilities and backgrounds are present in the same classroom. In response to these kinds of educational settings, researchers and practitioners often explore various options to differentiate and adapt instruction to students’ needs (Bill and Melinda Gates Foundation, 2006; Vaughn et al., 2016).

We observed several differentiation strategies while visiting Job Corps centers, many of which are consistent with recommendations from the research literature. For example, through flexible grouping, students may be grouped with a subset of their peers with similar interests or readiness. In several centers, students were placed into one of several different math or reading sections based on their TABE scores. Another approach, referred to as tiered assignments, allows students to engage with the same material but at different levels of complexity, based on their level of mastery.

TBL in and of itself is often discussed as a tool for differentiation. To the extent that a TBL program can adapt its content and perhaps its instructional approach, particularly an asynchronous and independent environment, allows students to work at their own pace and on different content, TBL programs may be able to differentiate instruction among students relatively easily. Additionally, these programs often build in initial assessments of students’ skills and prior knowledge so as to identify those instructional areas in which students need the most remediation and to tailor the coursework, and grouping if applied, to those needs. Those same tools typically offer instructors information on students’ real-time progress and challenge areas.

However, it’s important to understand exactly what kinds of knowledge those assessments are developed to identify. Previous research has shown that Job Corps students’ performance varies when subjected to different types of assessments of reading and math skills. In a comprehensive assessment of literacy and numeracy skills of a sample of Job Corps students, a team of researchers subjected students to a full battery of seven different assessments, each intended to measure a different aspect of literacy and numeracy (Mellard et al., 2012). Exhibit 17 lists those assessments and their associated skill or concept measured. The researchers found that Job Corps students struggled most with reading fluency, functional literacy, and functional numeracy. This suggests that if the Job Corps program considers implementation of a TBL resource intended to differentiate instruction, that resource ought to include some form of skills assessment and clearly identify the literacy and numeracy concepts measured.

Exhibit 17: Literacy and Numeracy Assessments and Associated Concepts

Assessment	Concept Assessed
Comprehensive Adult Student Assessment (CASAS)	Functional literacy and numeracy
Woodcock Reading Mastery Test-Revised	Word reading
Test of Word Reading Efficiency (TOWRE)	Word reading efficiency
Peabody Picture Vocabulary Test - III	Vocabulary
Group Reading and Diagnostic Evaluation (GRADE) Vocabulary subtest	Vocabulary
Qualitative Reading Inventory	Oral Reading Fluency
Group Reading and Diagnostic Evaluation (GRADE) Comprehension subtests	Reading comprehension

Source: Mellard et al., 2012

8.2.2 Capacity to acquire and implement TBL

As we discussed in Chapter 7, centers report significant challenges associated with their financial and logistical capacity to implement or expand the use of TBL for remediation. We don't expect the research literature to offer much insight on innovative or evidence-based strategies to address these challenges, since the approach seems almost self-evident. By allocating more funds to the purchase of equipment or maintenance of IT systems, Job Corps may alleviate some of these cost-related challenges. Additionally, some center-level management said that they might be able to find funds to support TBL expansion if they had more flexibility in their budgets and spending requirements.

Centers could also make better use of existing technology capacity by ensuring they have adequate information technology (IT) support on center. As discussed in Chapter 7, centers that maintain a dedicated IT support person on staff report that they value that position. In some centers, administrative and instructional staff spend a portion of their time in this role, but they report having insufficient time to entirely fulfill the IT support role.

8.2.3 Sharing best practices

In several site visit interviews, center leadership either expressed a desire to learn more about what other Job Centers use with regard to TBL resources. Additionally, centers that are run by an operator that manages several centers report an appreciation for the sharing of best practices among their sibling centers. Given the extent to which TBL implementation varies across the center network, centers may also benefit from sharing best practices, specifically with regard to utilizing TBL resources in cost-effective ways. As we noted in Chapter 4, there are over 20 different TBL programs in use for remediation across the country, and some centers have prior experience with programs no longer in use. While this report captures detailed center-specific experience with TBL, an ongoing community of practice may allow for continued sharing of ideas and experiences, such as approaches to IT support services or a list of trusted TBL resources that are freely available over the internet or not too costly. The community of practice could be centralized around a designated space on the Job Corps website that houses resources such as desk aids, recorded webinars, and podcasts.

Among those centers that are run by organizations that operate more than one center, leadership often notes that center operators will collect and disseminate best practices among their network. While this arrangement might not be feasible across center operators, the National Office is in a unique position to promote best practices by sharing the information gathered through data collection efforts such as this one or process studies of future TBL implementation efforts.

8.2.4 Avoiding distraction and maintaining student engagement (or learning) in TBL

On a number of our site visits, students and instructors noted that avoiding distraction and maintaining student motivation can be a challenge when implementing a TBL resource or program. Students may find certain TBL environments unengaging, leaving them more susceptible to distraction. These challenges aren't unique to TBL environments. Traditional instructional settings also struggle to maintain student engagement and motivation (Lee & Hammer, 2011).

In an effort to make TBL resources more appealing to students and facilitate more learning, instructional designers have often turned to "gamification" of instruction. Education experts have embraced the concept--which entails using game-like elements in non-game educational contexts--over the last decade (Deterding, 2011).

In a comprehensive thematic analysis of the application of gamification in education, Dicheva and colleagues developed a broad set of gamification design principles. They include challenges and quests, progress tracking, feedback to students, competition, cooperation/social engagement, freedom of choice, unlocking content, storytelling, etc. (Dicheva et al., 2015). By mapping this set of principles to existing TBL resources, the authors determined that the most prevalent game design principles are “visible status” (e.g., awarding badges/points or tracking a leaderboard) and “social engagement” (e.g., team competitions). Of course, these principles are not unique to TBL, as comparable strategies have long been used to increase student motivation in traditional educational settings.

While Dicheva and colleagues also report that the field lacks rigorous experimental evaluations of game-based TBL programs, existing evidence suggests that game-based approaches improve both student learning and motivation (Papastergiou, 2008). In particular, badges (or awards for progress or skill mastery) have been shown to correlate with improvement in learner motivation, particularly among low-performing students, but not all badges function in the same way (Abramovich et al, 2013). Badges for participation may have different effects on student motivation compared with badges awarded for skill mastery. The authors suggest that skill mastery badges would help students connect their performance to their internal motivation, while participation badges would not.

8.2.5 Tech literacy among instructors

In Chapter 6, we reported that technological literacy is not currently a widespread problem, as centers tend to report it as a minimal barrier to TBL expansion. However, it remains a significant challenge among a notable minority, roughly 15 percent of centers. Moreover, it can have cascading or multiplying consequences, depending on instructors’ ability to keep pace with advances in technologies, products, and teaching techniques.

Classroom observations on site confirmed that several instructors struggle to properly use certain TBL tools, especially complex interactions between software and hardware. The simple approach to tackling this challenge is to allow for more or better professional development in the area of technology skills. We summarize a few best practices in professional development below.

Jones and Dexter (2014) find that instructors often engage in independent and informal activities when learning a new TBL tool. Most professional development relies too heavily on formal instruction and instead should take a more holistic approach. They argue that administrators should not only create more opportunities for informal and independent learning, but they should also “incentivize instructors to engage in these activities, develop ways to aggregate teacher knowledge, and disseminate information arising from these activities...” While formal training is effective for an initial introduction to a TBL resource, instructors would benefit from more opportunities to practice independently and collaboratively with hands-on experience with a TBL tool if they are to understand it.

Beyond the initial learning stage, instructors report that it’s helpful to have a collaborating teacher with whom they can collectively plan and implement a TBL resource (Lee et al., 2010). Essentially, leaving a single instructor to implement a TBL tool in isolation is likely less effective than having at least two instructors responsible for use of the tool. The opportunity for collaboration also allows for the most technologically savvy instructors to serve as mentors to less-skilled peers. Lee and colleagues also found that the peer-to-peer support and collaboration is more helpful than administrative support for learning a new technology resource.

Finally, An and Reigeluth (2011) surveyed K-12 teachers on their experience with and perceptions of technology-enhanced, learner-centered instruction and came away with several recommendations for optimizing technology-oriented professional development courses. First, instructors complain when professional development training is too broad and doesn't cover enough subject-specific (e.g., math-specific) examples. At the same time, instructors complain when they feel that a course has too much information included in a single lesson. To comprehend each piece of information properly, instructors wanted time to practice and gain hands-on experience with a TBL resource.

8.3 Conclusions

In this report, we have established that a large majority of Job Corps centers currently use TBL resources for the academic remediation of reading and math skills. Centers' use of these resources vary considerably, and only one software resource is in use by a majority of centers for remediation. Given budget constraints, most centers report that the cost of TBL resources poses a significant challenge to acquisition and implementation. Other challenges include software security requirements and limited internet connectivity and bandwidth. A small share of centers report challenges associated with instructors' and students' technological literacy and general capacity to use TBL.

Yet, given the programmatic environment in Job Corps, with rolling admissions of students with different academic skills at entry, giving students a platform for personalized and independent learning seems to make a lot of sense. Most center directors report that they think TBL resources can be as effective or more effective than traditional education for remediation of reading and math skills; but Job Corps needs to address several capacity-related challenges as it seeks to expand the program's use of TBL. Having established an understanding of the program's current use of TBL for academic remediation, additional research may be warranted to understand the effectiveness of TBL in this setting.

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Appendix A: Data Collection Methods

The data collected for this study come from three sources: 1) a survey administered to every Job Corps center around the country¹⁷, 2) semi-structured interviews with Job Corps center staff at seven sites, and 3) focus groups conducted with students at those same seven centers.¹⁸ This appendix provides detailed background on the process by which we collected data from each source.

Survey Data Collection

The study team administered the *Survey of Technology-Based Learning in Job Corps* to collect information on TBL adoption to support math and reading remediation within Job Corps. The team administered the survey to 125 Job Corps center directors who are responsible for planning and administering the centers' policies and activities, including those related to remedial education. The survey attained a 92% response rate, with 115 directors providing responses.

Reflecting the study's research questions, the survey covered the following topics:

- Current use of TBL for remedial math and reading
- Hardware used with TBL
- Instructional settings and approaches for TBL
- Decision making about TBL adoption and use
- Effectiveness and satisfaction with TBL
- Perspectives on key supports and challenges for TBL

The full survey is available in Appendix C. We designed it for online administration and pretested it before administration. We asked the seven centers that hosted site visits (see below) to participate in pretesting. We asked pretest respondents to complete the online survey instrument and submit their feedback, which the research team used to refine the survey.

We emailed the survey to all center directors¹⁹ using contact information provided by the Job Corps National Office. The survey was fielded during a four-week period in winter 2017-2018. To maximize survey response, the study team, in partnership with the National Office, developed communications to notify and remind directors to complete the survey, as shown in Exhibit A.1. The materials included:

¹⁷ Information on the non-response analysis to the survey and a copy of the survey are provided in this report in Appendices B and C, respectively.

¹⁸ In addition, the Job Corps National Office provided the study team with supplementary administrative data on basic characteristics of Job Corps centers and the student population from the Outcome Measurement System (OMS) Report Cards. These data were used in the non-response analysis discussed in Appendix B.

¹⁹ Per a request from the Job Corps National Office, one center did not receive a survey invitation because of extenuating circumstances that prevented its participation. This center is excluded from the sampling frame.

- *Advance email.* The National Office emailed all center directors three days before survey administration, notifying them of the upcoming survey and the purpose of the survey as it related to the broader study
- *Invitation emails.* During the first week of data collection, we sent center directors invitation emails, which contained study and contact information, directions for completing the survey, and the center's designated hyperlink to the online instrument
- *Reminder email from National Office.* The National Office sent a reminder email to the regional directors during the second week of data collection. The email asked regional directors to follow up with center directors who had yet to complete the survey
- *Reminder email from survey team.* The study team sent out two reminder emails during the second week of data collection, reminding respondents who had not yet done so to complete the survey before the deadline. The email reiterated the importance of the survey for the broader study, directions for completing the survey, contact information if respondents required assistance, and the designated hyperlink to the online instrument
- *Extension notification email.* During the third week of data collection, the study team emailed non-respondents, notifying them of an extension of the fielding period. The email reiterated the importance of the survey for the broader study, directions for completing the survey, contact information if respondents required assistance, and the designated hyperlink to the online instrument

Exhibit A.1: Survey Communication Schedule

Type of Contact	Date
Advance letter (NOJC)	December 4 th , 2017
Invitation email	December 7 th , 2017
Reminder email (NOJC)	December 15 th , 2017
Reminder email	December 20 th , 2017
Reminder email	December 22 nd , 2017
Extension email	December 29 th , 2017

In all, we sent the survey to 125 center directors, and 115 completed the surveys (a 92% response rate). Respondents provided complete responses to the survey. There were no partially completed surveys. Therefore, the cooperation rate - the proportion of the sample that completed or partially completed the survey - is also 92%.

Site Visit Data Collection

The study team conducted seven two-day site visits at different Job Corps centers in five DOL regions between October 2017 and November 2017. Across all seven centers, the study team conducted 49 interviews and student focus groups and 17 classroom observations. Exhibit A.2 below provides a breakdown of the centers that site teams visited and the number of interviews, focus groups, and observations that the study team conducted at each center.

Exhibit A.2. Job Corps Centers Characteristics and Data Collection

Job Corps Center	State	Regional Office	Total number of interviews and focus groups conducted	Number of classroom observations conducted
Clearfield Job Corps Center	Utah	Dallas, TX	8	3
Denison Job Corps Center	Iowa	Chicago, IL	7	3
Frenchburg Job Corps Civilian Conservation Center	Kentucky	Philadelphia, PA	5	3
Dr. Benjamin L. Hooks Job Corps Center	Tennessee	Atlanta, GA	8	2
Carl D. Perkins Job Corps Center	Kentucky	Philadelphia, PA	7	2
Schenk Job Corps Civilian Conservation Center	North Carolina	Atlanta, GA	7	0
Treasure Island Job Corps Center	California	San Francisco, CA	7	4

The Job Corps National Office selected the seven centers to provide a geographically diverse sample and demonstrate promising TBL approaches. After the selection, the study team sent introductory emails to each center director that explained the goals of the study and the site visit. Site visitors worked with center directors to create a schedule of interviews, student focus groups and observations. We crafted schedules to ensure that the study team would interview a diverse group of staff members who were using TBL, including center directors, academic managers, remedial math and reading instructors, and IT support staff.

We conducted each site visit over the course of two days. The site visit teams consisted of one senior site visitor who led interviews and focus groups and one junior site visitor who took detailed notes. The site visitors varied depending on the site. Before interviews and focus groups, participants were read a short introduction of the study and a confidentiality notice. The notice explained that the information that they provided in the interview would not be linked to their name in the report and that the content of their responses would not impact their relationship with the center or DOL. To preserve the confidentiality of participants, none of the interviews or focus groups was recorded.

The interview guides focused on the following topics, which reflect the study's research questions:

- Interviewee role and target population for study
- Current use of TBL for remedial math and reading
- Prioritization of TBL and decision-making about TBL
- Center context for TBL use
- Effectiveness and satisfaction with TBL
- Perspectives on key supports and challenges for TBL

Site visitors used three different interview guides: one for center directors, one for academic managers, and another for academic instructors. Each guide varied slightly based on the role of the interviewee, but all asked similar questions about these topic areas. While the study team attempted to ask a standard set of questions across the interviewees, this was not always possible due to the time constraints and inapplicability of some

questions to certain interviewees. As a result, not all interviewees were asked every question on the interview guide.

Site visitors used the same focus group guide for all student focus groups. This guide asked questions about student experience with TBL at their center, including the TBL approaches that students used in their classrooms and in independent study and the pros and cons of TBL. When conducting classroom observations, site visitors sat in the back of remedial math and reading classrooms and took detailed notes about the use of TBL in the classroom, the role of the instructor and student, and the hardware and software in the room.

Appendix B: Survey Non-response Summary

The *Survey of Technology-Based Learning in Job Corps Centers* successfully gathered information from 115 Job Corps center directors to achieve a 92% response rate. Since some center directors did not complete the survey for their Center, this appendix assesses whether the report's findings based on survey data are likely valid for the entire Job Corps center population.

Survey response may be related to characteristics in such a way that centers completing the survey are not comparable to centers that did not. If our findings differed on the same characteristics that relate to response, then findings may not be applicable to the Job Corps center population despite the high response rate. To assess the extent to which findings are likely applicable to non-respondents, we examine whether respondents and non-respondents systematically differ across center characteristics.

Exhibit B.1 compares center characteristics of survey respondents and non-respondents from administrative data provided by DOL and publicly available from Job Corps' *Outcome Measurement System (OMS) Report Cards*. We selected center characteristics thought to be correlated with center use of TBL for math and reading remediation. Only one significant difference, measured by chi-squared tests, was found between respondents and non-respondents: whether the center was operated by a private contractor or the USDA Forest Service.

The response rate for centers operated by the USDA Forest Service was significantly lower than centers operated by a private contractor. Since survey data are not available for non-respondents, we do not know the extent to which TBL use differs systematically between centers operated by a private contractor and those operated by USDA. Without that information, we cannot determine how the variation in response rates affects the likelihood that findings are valid for the entire Job Corps center population. Therefore, this non-response analysis suggests that findings based on survey data should be interpreted with some caution.

Exhibit B.1: Center Characteristics of Survey Respondents and Non-respondents

Center Characteristic (%)	Respondents	Non-respondents	Total
Center Location			
Rural	47.8	80.0	50.4
Suburban	20.0	20.0	20.0
Urban	32.2	0.0	29.6
Center Region			
Atlanta	13.9	20.0	14.4
Boston	18.3	0.0	16.8
Chicago	16.5	20.0	16.8
Dallas	18.3	20.0	18.4
Philadelphia	14.8	30.0	16.0
San Francisco	18.3	10.0	17.6
Center Type**			
Private Contractor	83.5	30.0	79.2
USDA FS	16.5	70.0	20.8
Center Capacity			
Below 200 students	24.3	60.0	27.2
200 to 400 students	56.5	30.0	54.4
More than 400 students	19.1	10.0	18.4
Center HSE/HSD Goal			
Model adjustment is above national goal	28.7	30.0	28.8
Model adjustment is below national goal	41.7	50.0	42.4
No model adjustment	29.6	20.0	28.8
Total Number of Centers	115	10	125

***: Differences between Respondents and Non-respondents are significant at the 0.01 level.

Source: Job Corps administrative data and *Outcome Measurement System (OMS) Report Cards*.

Appendix C: Survey of TBL for Remediation in Job Corps**Survey Questionnaire
Technology-Based Learning (TBL) in Job Corps****Introduction:**

Your assistance is requested to complete a survey about your Job Corps Center's use of technology-based learning (TBL) -- with a special focus on math and reading remediation. TBL encompasses many different types of technology, including computer-based learning systems, whether interactive, online or specific to Centers, as well as use of videos and audio for teaching and skill practice.

All Job Corps Center Directors are being asked to complete this survey. Your responses, compiled with those from other Centers, will provide critical information to help in understanding the size and scope of current TBL use in Job Corps for remediation, promising practices, connectivity levels, and potential challenges. This will be of interest to the Job Corps system, due to the demand for higher skills in many jobs in the economy and the hope that basic skills acquisition can be substantially accelerated or improved using technology with those students who may need such help.

The survey is being conducted by the Employment and Training Administration (ETA) under OMB Control # 1205-0346. ETA's Evaluation unit, with input and support from the Job Corps National Office, is directing the survey. Two research firms, Abt Associates and its partner, MEF Associates, are administering it under contract with ETA. Please note that your responses to this survey will not be revealed and that the survey is **not** part of a Job Corps audit or a compliance review. However, we may identify to the National Office of Job Corps those centers that do not respond to this survey. If you have any questions or comments regarding any aspect of this survey, please contact Evaluation unit staffer, Sande Schifferes at Schifferes.charlotte@dol.gov or 202/693-3655

The survey should take about 45 minutes and the completed questionnaire should be submitted by December 22nd. Please consult your staff as needed. There are no right or wrong answers but please know that information about your Center's experience with, and candid opinions about, TBL will be very much appreciated.

Thank you for your responses to this important survey.

I. CENTER CHARACTERISTICS AND USE OF TECHNOLOGY**1. What is the name and ID for your center?**

Name _____

Center ID _____

2. Our understanding is that Job Corps centers administer the TABE test to determine a new student's grade level in math and reading. Do you use any other assessments of student's grade level, and if so, please list them below:

Please specify _____

In this survey, technology-based learning (TBL) is defined to include any teaching and learning approaches that use electronic technology, such as on-line or Center-specific educational software programs (including those with simulations, game-like elements, and embedded assessment or digital tutors), live or recorded video or audio, and electronic methods of communicating with instructors or peers.

3. a. Does your Job Corps center currently use TBL to teach remedial math and/or reading (i.e., to students below the 9th grade level)? Yes No**3. b. Please check the other areas for which your center uses TBL:** High school level academics/GED, HS diploma, or equivalent Services to students with IEPs English as a Second Language (ESL) Employment readiness/workplace basics (Dress, communication, behaviors) Occupational exploration Job search/resume preparation Career and technical training No areas other than reading/math remediation Other (please specify) _____

II. HARDWARE USED WITH TECHNOLOGY-BASED LEARNING

4. We'd like to find out what types of hardware are used in your Center. Please check the appropriate boxes below regarding the hardware used generally and that used specifically for math and/or reading remediation.

Type of Equipment	Used with <i>any</i> learning areas	Used for <i>remediation</i>
Laptop or desktop		
Smartphone		
Tablet or touchscreen laptop		
SMART Boards		
Telephone or videoconference equipment		
Audio player		
Television or video (e.g., DVD)		
Projector or other presentation equipment		
Other (please specify) _____		
None		

5. How do students typically access TBL hardware and other equipment used for math and/or reading remediation? *Select all that apply.*

- Housed in a Job Corps classroom
 Housed in a Job Corps computer lab
 Housed in a Job Corps dormitory common space
 Loaned to Job Corps students for individual use and accessed as needed
 Generally owned by individual students and accessed as needed
 None
 Other (please specify) _____

6. Which of the following types of TBL tools for communication and information sharing does your center have that supports the delivery of math and/or reading remediation? *Select all that apply.*

- Online collaboration tool (e.g., Google Drive; SharePoint)
 Learning Management System (LMS) for online classroom engagement and management (e.g., Blackboard)
 Online discussion boards or message boards
 Webinars (live/recorded)
 Videoconference technology
 Online messaging
 None
 Other (please specify) _____

7. Who provides technology support to student and staff using TBL for math and/or reading remediation? *Select all that apply.*

- Job Corps IT Help Desk staff
- Other Job Corps IT staff
- Individual instructors
- Other Job Corps staff
- External contractor
- None
- Other (please specify) _____

III. INSTRUCTIONAL SETTINGS AND APPROACHES

8. In using TBL for math and reading remediation, please indicate the *extent* to which your center uses the following approaches. *Please enter an answer for all rows.*

	Level of TBL use					Don't Know
	No use	Limited use	Moderate use	Significant use	Exclusive use	
Classroom-based group instruction	○	○	○	○	○	○
Independent self-study/self-paced learning	○	○	○	○	○	○
One-on-one tutoring	○	○	○	○	○	○
Small group tutoring or study sessions	○	○	○	○	○	○

9. Regarding software programs and online academic programs, please check the boxes for all programs in the list below that are currently in use or were previously used for math and/or reading remediation in your center.

	Currently used for math and/or reading remediation	Previously used for math and/or reading remediation
Lexia	○	○
IXL	○	○
KeyTrain	○	○
Instruction Targeted for TABE Success (ITTS)	○	○
Read 180	○	○
Math 180	○	○
Penn Foster	○	○
Acellus	○	○
Math Lab	○	○
Applied Educational Systems (AES)	○	○
LaunchPad	○	○
Voyager	○	○
MathXL	○	○

	Currently used for math and or/ reading remediation	Previously used for math and/or reading remediation
Odysseyware	<input type="radio"/>	<input type="radio"/>
Khan Academy	<input type="radio"/>	<input type="radio"/>
Dreambox	<input type="radio"/>	<input type="radio"/>
Istration	<input type="radio"/>	<input type="radio"/>
ST Math	<input type="radio"/>	<input type="radio"/>
Revolution K12	<input type="radio"/>	<input type="radio"/>
Compass Learning	<input type="radio"/>	<input type="radio"/>
Brightstorm	<input type="radio"/>	<input type="radio"/>
Achieve 3000	<input type="radio"/>	<input type="radio"/>
TenMarks	<input type="radio"/>	<input type="radio"/>
Successmaker	<input type="radio"/>	<input type="radio"/>
Accelerated Reader	<input type="radio"/>	<input type="radio"/>
Other _____	<input type="radio"/>	<input type="radio"/>
None	<input type="radio"/>	<input type="radio"/>

IV. DECISION MAKING ABOUT TBL

10. a. Are there currently any plans at your Center to expand use of TBL hardware and software generally?

- Yes
- No

10. b. Are there currently any plans at your enter to expand use of TBL hardware and software for math or reading remediation specifically?

- Yes
- No
- Don't know

11. Please indicate who are the primary decision-makers regarding the selection of TBL tools and strategies to support math and reading skill remediation at your center? *Select one.*

- Staff and Management within your Job Corps Center
- Job Corps National Office
- Corporate office staff (contractor)
- Other _____

12. From the list below, please select the three most important factors that your center considers when selecting the hardware used to support math and reading skill development for students requiring remediation at this Job Corps center.

- Cost of equipment/ Availability of funding for hardware
- Compatibility with existing center technology
- Installation, maintenance, technical support requirements
- Connectivity and reliability of connection (e.g., cable, Wi-Fi, cellular network)
- Compatibility with TABE Prep program standards and/or curricula
- Ease of instructor use
- Ease of student use
- Alignment with student skills and/or needs
- TBL tool features (e.g. demonstrated effectiveness in similar settings, monitoring tools)
- Job Corps National Office preferences
- Other partner preferences (please specify) _____

13. From the list below, please select the three most important “*structural features*” that your center considers when selecting the TBL software and online academic instruction programs used to support math or reading skill development for students requiring remediation at this Job Corps center.

[Only asked if responded to question 9 with an answer other than “none”.]

- Cost
- Compatibility with existing center technology
- Compatibility with TABE Prep program standards and/or curricula
- Ease of instructor use
- Ease of student use
- Features of the TBL program (e.g., monitoring tools, nature of the assessments)
- Research demonstrating the program’s effectiveness
- Job Corps National Office preferences
- Other partner preferences (please specify) _____

14. From the list below, please select the three most important “*content features*” that your center considers when selecting the TBL software and online academic instruction programs used to support math or reading skill development for students requiring remediation at this Job Corps center.

[Only asked if responded to question 9 with an answer other than “none”.]

- Ability to complete work at one’s own pace
- Ability to self-direct learning, allowing students to choose activities to complete
- Adaptive questions and exercises to personalize learning
- Assessments to determine skill acquisition or course completion
- Level of knowledge required for “mastery” of a skill
- Inclusion of a digital tutor or automated help function
- Rewards and digital certificates to recognize progress
- Other (please specify) _____

V. TBL IMPLEMENTATION

15. You indicated that your Job Corps center made use of technology to support math and reading skill development for students requiring remediation. Please indicate the extent to which technology is used for the areas below.

	No use of technology	Some use of technology	Exclusive use of technology
Initial assessment of reading and math skills.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In-class content delivery	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Independent practice (e.g., homework assignments)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Study aids	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Exams/quizzes/tests	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tracking student progress	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16. Is technology used for any other areas to support math and reading skill development for students requiring remediation?

Please specify _____

17. a. Do you formally assess whether students requiring remediation are able to use TBL tools and platforms?

- Yes
 No **[Skip to Q. 18]**

17. b. (If yes to Q. 17a) How do you assess whether such students are able to successfully use TBL tools and platforms? *Select all that apply.*

- Formal technological literacy assessment
 Instructor/staff recommendation
 Student preference/ self-selection
 Other (please specify) _____

18. a. Does your Center generally monitor students' use of TBL?

- Yes
 No **[Skip to Q. 19]**

18. b. (If yes to Q. 18a): How does your Job Corps Center monitor students' engagement with TBL software and/or other online academic instruction programs for math or reading remediation? *Select all that apply.*

- Monitor student time logged in
 Monitor student completion of units or sections
 Monitor student assignments completed in given time period
 Monitor instructor time logged in
 Student self-report
 Other (please specify) _____

VI. SUPPORTS FOR TECHNOLOGY-BASED LEARNING AND INSTRUCTION

19. What training and supports are available to instructors of students who require math and/or reading remediation to ensure that they can productively integrate technology into their instruction? *Select all that apply.*

- Assessment of instructor's technological literacy
- Training/professional development opportunities in technological readiness/literacy
- Ongoing mentoring or coaching
- Instructor/staff learning communities
- Technical support from Job Corps staff and/or assistance from an IT help desk
- Technical support from external organizations
- Access to newsletters, e-mails, or other communication that encourage use and provide user information
- Regular monitoring/updating of software and hardware
- None
- Other technical assistance (please specify) _____

VII. SATISFACTION AND PERCEIVED EFFECTIVENESS

20. Thinking about your overall use of technology-based resources for math and reading remediation, do you think it is more, less, or as effective as other methods used in your center for math and reading remediation?

- More effective
- Less effective
- The same

21. What sources of information do you use to determine the effectiveness of technology-based resources for math and reading remediation? *Select all that apply.*

- Formal assessments and testing
- Instructor feedback
- Student feedback
- Other (please specify) _____

22. Regarding different aspects of technology-based resources for math and reading remediation, please indicate how satisfied you are with each of the following? *Please enter an answer for all rows.*

	Unsatisfied	Somewhat satisfied	Satisfied	Highly satisfied
Student progress/learning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ease of use by students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ease of use by instructors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Integration with other aspects of Job Corps program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tech support from hardware and software providers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

VIII. IMPLEMENTATION BARRIERS

This section seeks to understand the extent to which your center has experienced barriers in using technology for remediation and the nature of these barriers.

23. To what extent do the following instructor/staff readiness factors pose barriers to more extensive use of technology for remediation? *Please enter an answer for all rows.*

	No barrier	Minimal barrier	Significant barrier	Don't know
Instructor's technological literacy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access to needed hardware	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access to needed software	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Availability of training to use the TBL tool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Availability of continuous supports needed to use the TBL tool (e.g. IT staff to troubleshoot)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Instructor's interest in using the TBL tool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

24. To what extent do the following student readiness factors pose barriers to more extensive use of technology for remediation? *Please enter an answer for all rows.*

	No barrier	Minimal barrier	Significant barrier	Don't know
Technological literacy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access to needed hardware	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access to needed software	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Availability of training to use the TBL tool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Availability of continuous supports needed to use the TBL tool (e.g. IT staff to troubleshoot)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interest in using the TBL tool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

25. To what extent do the following technological factors pose barriers to more extensive use of technology for remediation? Please enter an answer for all rows.

	No barrier	Minimal barrier	Significant barrier	Don't know
Software or system requirements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access to equipment/ hardware	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hardware/ software compatibility	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hardware/software licensing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Security requirements (e.g., unable to disable firewalls or pop-up blockers)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reliability of connectivity/ bandwidth within the center	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Responsiveness or capacity of the Job Corps IT Department or Help Desk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Responsiveness or capacity of Job Corps Regional and/or National Office to provide support	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

26. To what extent do the following cost factors pose barriers to more extensive use of technology for remediation? Please enter an answer for all rows.

	No barrier	Minimal barrier	Significant barrier	Don't know
Costs of licensing/ subscription for program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cost for hardware purchase and/or maintenance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Operating costs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Costs related to staff members devoted to TBL	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Costs for staff development/ training for TBL	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Program development/ integration of TBL	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

27. To what extent do the following curriculum factors pose barriers to more extensive use of technology for remediation?

	No barrier	Minimal barrier	Significant barrier	Don't know
Compatibility with TABE requirements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Alignment with existing curriculum	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Alignment with existing schedule/ student time for TABE prep	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Alignment with student learning goals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Appropriate for student skills and characteristics				

IX. OPEN-ENDED QUESTIONS

28. Reflecting on your experiences, what are the key factors to consider *when adopting and implementing TBL* for students in need of math and reading remediation – or for all students?

29. In your opinion, what are the most critical factors *related to the effectiveness of TBL* for students in need of math and reading remediation – or for all students?

Thank you for your participation.

[END OF SURVEY]