

Computer-based GED Testing: Implications for Students, Programs, and Practitioners

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Abstract

The purpose of this study was to understand the process of transitioning from the 2002 version of the GED test to the new 2014 computer-based version. Specifically, this research sought to identify: (1) stakeholder attitudes regarding the new computer-based test; (2) the relationship between students' computer access/comfort and their perceptions of the new test; and (3) program modifications that will be most beneficial to this student population in terms of adequately preparing them for earning their high school equivalency via the GED. Key findings indicate: negative perceptions of computerized testing among participants, differences in attitudes and ability among students when compared by age and access to a computer in the home, and a desire for additional training and support among both students and teachers.

Introduction

In January 2014, GED Testing Service transitioned to the fifth version of the test since its creation in 1942. Several major revisions were made, though one of the most notable changes was the move from a paper-based test to one that is entirely computer-based. Other changes included an increase in testing fees, as well as assessing students with more rigorous content in order to better measure and determine college and career readiness (Hoffman, Wine, & McKinney, 2013). Since the announcement of the new test was made, two challenges faced by high school equivalency (HSE) test preparation programs have been: (1) implementing a smooth transition to a new assessment, and (2) adapting programs to meet the evolving needs of students as a result of the requirements of the new test. These challenges, which occurred in the context of a changing adult basic education landscape, are important and timely topics; further, relatively little is known about how this process unfolded within individual programs.

Thus, the purpose of this study was to understand the ways in which two programs located in a southern state adapted to these changes, particularly regarding the move away from a paper-based test. This overarching purpose was guided by three research questions. First, what were the attitudes held by key

stakeholder groups about the new test leading up to its implementation? Second, what is the relationship between students' computer access/comfort and their perceptions of the new test? Third, how did these programs plan to address emerging student needs and adequately prepare these individuals for earning their high school equivalency via the GED? The following section of this paper includes a review of the relevant literature, which lays a foundation for this study.

Literature Review

In order to frame the present study, it is important to consider three key areas from the literature. First, it is useful to understand the history and overview of the most recent changes to the GED test, as well as how these changes fit into the larger Adult Basic Education (ABE) context. Second, this review briefly describes the scholarly work pertaining to adults and their computer use and comfort. Third, an overview of the skillset and outcomes needed for HSE graduates is addressed.

Over 70 years ago, the General Education Development (GED) test was made available by the American Council on Education and was designed to assist in job placement of returning war veterans. In the years that followed, however, the purpose of the test was extended to assist adult civilians in need of an alternative to a high school diploma (Quinn, 2002). While the first version of the GED test was used for 40 years, it has since been revised four times: in 1982, 1987, 2002, and most recently in 2014. However, the latest revisions to the test have been by far the most comprehensive. For example, the newest version test is not only more challenging in terms of content and assessing higher order thinking, but it was designed with students' college and/or career readiness in mind; in addition, it is available only on computer

(Hoffman, Wine, & McKinney, 2013; Martin, 2014).

Yet another important change worth noting is the addition of two alternative assessments that were released in 2014, which are also used to award a HSE. The first alternative, the High School Equivalency Test (HiSET), was developed by Educational Testing Service (ETS) and is currently available in 14 states. The second alternative, the Test Assessing Secondary Completion (TASC), was designed by McGraw-Hill and is available in five states. Both of the alternative assessments offer the test on both paper and computer, whereas the GED is available only on the computer. Since the move to the 2014 GED test, as well as the release of the alternatives noted above, states have continued to change the assessment(s) they offer. In addition to the option for two testing formats (paper or computer), the alternative assessments tend to be less expensive, although the exact cost can vary by state. Table 1, below, shows a breakdown of HSE tests and where they are offered, current as of June 2015.

A second important topic area for this review of the literature is to establish what is known about adults' computer use and comfort. Regarding both comfort with and use of technology, previous research has already demonstrated what Kontos, Bennett, and Viswanath (2007) described as the "digital divide," or the growing disparity among people of higher socioeconomic standing possessing greater access and usage of the internet compared to those of lower socioeconomic standing (Brown, 2011; Hargittai, 2002). While it may be true that the internet is available to all, previous research has found that low-income individuals tend to have less access to computers and lower computer skills overall (Araque et al, 2013; Guillen & Suarez, 2005). This may result in greater computer anxiety, which Sivakumaran and Lux (2011) described as "resistance, fear or anxieties

toward computers"; the authors also noted that, for many adults, learning both test content *and* new technology skills simultaneously can be a daunting task (p. 155). An earlier study by Bohlin and Hunt (1995) found that adult learners lacking in computer skills experienced more frustration and anxiety; however, one's willingness to use the computer, perceptions of how effective the process was, and having some level familiarity helped to reduce these negative feelings. One's aversion to computers may stem from a general lack of understanding regarding actual use; further, some adult students may have had no prior need to use a computer or simply may not have had access to one (Sivakumaran & Lux, 2011).

George-Ezzelle and Hsu (2006) carried out a study of computer familiarity among 539 GED test candidates ages 16-69. The researchers mailed surveys to a random, stratified sample of 5,000 U.S. test candidates drawn from the GED database. In this study, the results of the survey indicated that more than 62% of the respondents had experience with computer-based testing; further, while 63% reported having access to a computer in the home, 12% reported that they did not use one at all at the time of the study. Another interesting finding from George-Ezzelle and Hsu's study was that 67.5% of the survey respondents stated they would have preferred a computer-based test, and that 96% reported they would still take the test if it were available only on the computer. One of the most notable takeaways from this study, however, was the analysis by age, which showed that younger students (those under 30) reported higher levels of computer knowledge, comfort, and willingness to test on the computer.

A variety of other studies have addressed the computer literacy needs of adult learners. Sivakumaran and Lux (2011), for example, developed a three-step process for assisting adult learners with

successful technology integration and use. Although this process was designed for adults within a higher education context, it will be applicable to students of adult basic education programs as well. The first step is to recognize and demonstrate practical uses of computers to provide adult learners with positive experiences (Mayhorn, Stronge, McLaughlin, & Rogers, 2004). The second step is to create a positive learning environment, which can be achieved through workshops and training in a computer lab staffed by patient and knowledgeable instructors who encourage learners (Jones & Bayen, 1998). Step three entails providing an ongoing support system for students, whether that is a staff person, instructor, or tutor.

The third broad area useful for framing the purpose of this study is the skillset needed for (or expected of) those who hold an HSE credential. Beyond simply the content and technical aspects of preparing students, it is useful to recall the purpose of a credentialing test such as the GED, HiSET, or TASC: to provide a high school equivalency diploma. Yet, prior to the changes in 2014, some economists were critical of this type of credential as to whether it was actually equivalent (Cameron & Heckman, 1993; Murnane, Willett, & Tyler, 2000; Rumburger, 2011). De Carvalho and De Castro (2011) elaborated on one of the key challenges, noting that potential employers, postsecondary institutions, or the military, for example, can differentiate between those with a credential (such as the GED) and those without one, using this information as a signal about the expected productivity or ability of individuals holding that credential.

To be sure, standardized exams, such as the GED, may be valid and reliable measures of cognitive/knowledge skills (arguably, the most important skills). Yet, multiple studies have demonstrated that

these tests fail to emphasize *non-cognitive* skills and abilities important to one's performance, such as motivation, self-esteem, or self-control (De Carvalho Andrade & De Castro, 2011; Cawley, Conneely, Heckman, & Vytlacil, 1996; Heckman, LaFontaine, & Rodriguez, 2008). The problem, however, is having a standard which *only* signifies cognitive/knowledge skills, while neglecting to account for other abilities, skills, or characteristics (see Rumburger, 2011). Some research has suggested that establishing higher standards, such as those implemented in 2014, may actually result in a less-qualified labor force. This is due to the fact that individuals with skills lower than those emphasized in the cognitive test, though they may possess higher *non-cognitive* skills, may be no longer qualified to pass it or even make the effort to reach the new standard (De Carvalho & De Castro, 2011).

To address this issue, the test's developers now have *two* levels of passing: those who meet the traditional HSE level and a GED Score with Honors, which reflects performance in line with college/career readiness ("2014 GED"). However, as Rose (2013) points out, "the traditional level will be symbolically rendered even more of a second class certificate" (p. 47). As such, De Carvalho Andrade and De Castro (2011) recommended working toward greater alignment between the skills needed to pass exams and the skills that are actually needed in the job market, which one may argue is achieved with the content and format of the new GED test. However, in viewing the current assessments as equivalents, this does raise the question as to what additional training, support, or skill development adult basic education students may need.

The research reviewed in this section provides an important backdrop to the research objectives of the present study, which will consider: (1) stakeholder

attitudes toward the new computerized test; (2) the relationship between students' computer access, use, and comfort, and their attitudes toward the test; and (3) issues related to both high school equivalency diplomas and the demands of the new test. The following section reviews the research design, data collection, and analysis methods employed as these topics were considered, followed by an overview and discussion of the findings.

Methods

This study employed a mixed methods research design by incorporating both qualitative and quantitative methodologies in order to address the research questions. Specifically, a concurrent embedded strategy was used, for which Creswell (2009) noted its:

use of one data collection phase, during which both quantitative and qualitative data are collected simultaneously. [However], unlike the traditional triangulation model, a concurrent embedded approach has a primary method that guides the project and a secondary database that provides a supporting role in the procedures (p. 214).

Given the interest in studying the two programs and participants at an in-depth level, this study was designed with a qualitative approach in mind. It was determined to be the most useful for describing the experience of preparing for a new HSE test. This approach also fits into Morse's (2003) typologies of mixed methods research, specifically following the "QUAL + quan" design, which indicates a study that is qualitatively driven but carried out simultaneously or concurrently with the quantitative component (Morse, 2003, p. 198).

Program Descriptions

The two programs involved in this study are located in a southern state within the same county, serving an urban-suburban adult basic education population. These programs were selected because both (1) are free and open to the public, (2) serve adult students of all ages who are 18+, (3) have operated successfully for more than two decades, demonstrating an established record of previous success, and (4) offered multiple class times and locations throughout the local area, which was thought to be more representative of the larger student population. Further, these programs were selected because (5) one is a federally and state-funded program while the other is a 501(c)(3) nonprofit funded solely by grants and donations, providing two possibly differing perceptions from staff on the changes. Lastly, the two programs involved in this study were selected because they (6) report having a “good working relationship” with one another, in that each will refer students to the other’s program if it is believed the student would be better-served by the scheduling, location, or teaching approach taken by that program. The directors are in regular communication with one another, and knew that the other was participating in this study.

Program A is the largest program in the county, receives federal and state funds, and serves approximately 500-600 students seeking their HSE during the quarters reported. Program A offers several class schedules; all class scheduling options meet either one or two days a week, with the in-class time commitment ranging from four to eight hours per week. Additionally, this program employs one Program Supervisor, one full-time teacher, and five part-time teachers.

Program B, conversely, is a smaller program, serving approximately 20-25 students seeking their

HSE at any given time. Program B, a non-profit 501(c)(3) organization completely funded by grants, donations, and fundraising efforts, and offers its classes on a two-day, four hours-per-week schedule. This program employs an Executive Director, a Program Director, and between five and ten part-time and volunteer teachers at any given time, who work between two and ten hours each week. At the time of this study, both programs operated in a completely paper-based manner, in that neither utilized instructional technology in the classroom nor offered technology training to students.

Participants, Data Collection, and Analysis

Data were collected from both programs and included three groups of participants: administrators, teachers, and students. However, it should be noted that, although all individuals from both programs were invited to participate, only administrators and teachers from Program B, and students from Programs A and B, participated in this study.

First, it is useful to consider administrator input, as these individuals are responsible for overseeing program operations, communicating with funders about program success and future planning, and have the greatest knowledge about the program as a whole. Both administrators (the Executive Director and the Program Director) from Program B participated in one-on-one, semi-structured interviews; however, as noted above, the Program Supervisor and support staff from Program A did not participate in this study. Administrator interview protocols were developed in advance, with the intention of collecting information regarding (1) their opinions of the new test, (2) anticipated planning issues, (3) program needs and challenges as they pertain to the new test, and (4) student needs and characteristics. Two colleagues

with expertise in adult education reviewed these protocols for clarity and appropriateness of questions for meeting the research objectives.

Second, as the primary point of contact for students in the program, instructors play an important role in designing and teaching adult education courses and communicating information to students. To collect responses and information from instructors, two focus groups were held at two different class locations and, in all, six out of seven teachers from Program B participated in these meetings. Focus group questions were semi-structured and guided participants through a discussion of: (1) their opinions about the changes to the test (particularly with regard to the new computer-based format), (2) perceived program and teacher needs, (3) classroom operations, and (4) student characteristics, challenges, and abilities. Each focus group conversation lasted approximately one hour and, for nearly all of the questions, all focus group participants responded to and/or elaborated on one another's responses.

All interviews and focus group discussions were audio-recorded and fully transcribed. Transcripts were then reviewed twice by the researchers comparing the audio files to the accompanying text to check for accuracy prior to being moved into Nvivo10 for analysis. Nvivo is a program which supports both qualitative and mixed methods research, and can be used to analyze data via search, query, and mapping tools to identify connections among sources. In this assessment, Nvivo was used to code data based on nine key nodes as they emerged: "administrator involvement," "class descriptions," "concerns," "needs," "the new high school alternative," "next steps," "opinion of changes," "program changes," and "student descriptions." In order to ensure the codes were representative of the content discussed by participants, the query feature was used to conduct

a word analysis, and a word cloud was generated to visually represent the most common words in the data. Based on these analyses, some of the most commonly used words were "students," "changes," "test," "challenges," and "program." which appear to be in line with both the research questions and the established nodes. The use of qualitative data analysis such as Nvivo afford researchers and those reviewing their work greater transparency about the process and the findings, and support the ability to follow and verify steps taken in the research process. Data collected from administrators and teachers were used to address research questions one and three.

The third group of participants for this study was made up of students across both programs and data from these individuals were collected via a paper-based survey distributed to students during all classes taking place during a given week. Students received a copy of the survey in their classes, along with a letter explaining the purpose and scope of the study and that no identifying information would be collected; this letter also outlined how the findings would be used and stated that their participation was strictly voluntary. Students who opted to participate completed a 36-question survey containing a mix of quantitative and open-ended (write-in response) items designed to collect information about their (a) computer use and comfort, (b) opinions about the new test, and (c) interest in receiving and participating in future training and services.

Items pertaining to computer use, comfort, and attitudes toward computer-based testing were adapted from George-Ezzelle and Hsu's (2006) study on computer familiarity among GED test candidates. In their study, George-Ezzelle and Hsu included eight computer tasks, which were adapted and expanded for use in the present study; a comparison of these two instruments' items may be found in the appendix.

Prior to distributing the survey, three colleagues with extensive knowledge of adult basic education and three students completed the survey using a cognitive interview or “think-aloud” approach as described by Presser et al (2004), which is “used to produce reports of the thoughts respondents have either as they answer the survey questions or immediately after” (p. 112). This approach allowed the researchers the opportunity to ensure that all survey items were stated clearly for the information sought, as well as to determine approximately how long the survey would take to complete.

In all, 225 students were invited to participate; 124 students from Program A and 19 students from Program B completed surveys, totaling 143 respondents for a response rate of 63.55% across both programs. Of the 143 students who completed the survey, 33.6% were male, 55.9% were female, and 10.5% did not respond to this question. A majority of respondents (55.3%) reported that they were under the age of 29, while 22.7% fell between 30 and 39, 9.2% were between 40 and 49, and 12.9% were over the age of 50. Students also reported the highest grade reached before dropping out: 6% indicated that they had already earned a high school diploma; 9.7% had reached the 8th grade or below, 30.6% had reached the 11th grade (the largest group), while the remaining 53.8% were relatively evenly distributed between the 9th, 10th, and 12th grades. Complete demographic data from student respondents is exhibited in Table 2.

Quantitative survey responses were coded and entered into SPSS; prior to analysis, the data were cleaned, missing values reexamined, and all responses were re-checked against a codebook by both researchers for accuracy. Open-ended survey responses were entered into Microsoft Excel for coding and further analysis. Major themes were

identified by first tracking the frequencies of generalized statements. For example, item 22 on the survey asked students, “What is your opinion about the new test?” To analyze student responses to this question, written answers were tracked and organized by frequency to identify which generalized responses were mentioned most. Following this procedure, individual responses for major themes were reviewed to determine if there were any additional sub-themes that emerged. This process was repeated for all of the open-ended items in the survey.

As for additional quantitative analyses, a chi-square test was first employed to examine if having a computer at home would help more participants to take a computer-based test. Thirteen items on the survey asked respondents to indicate their levels of comfort in completing various computer tasks. The level of comfort was measured on a four-point Likert scale from 1 to 4 and included a not-applicable point of zero (“I have never done this.”). Scale points included: (1 = “Very Uncomfortable”); (2 = “Somewhat Uncomfortable”); (3 = “Somewhat Comfortable”) and (4 = “Very Comfortable”). Table 3 exhibits descriptions of each item as well as means and standard deviations.

There were a number of missing values in these 13 items measuring the students’ level of comfort. Therefore, instead of summing all the responses, intact scores were aggregated and averaged for individual students as the overall comfort scores ($M = 2.8$, $SD = 1.1$), indicating only a moderate level of comfort. The level of comfort was analyzed by using two different statistical techniques. A two-sample t-test was used to examine if there was any statistical mean difference between participants who had computers at home and those who did not have computer at home. A One-Way Analysis of Variance (ANOVA) was conducted to assess if there was any

difference in the level of comfort across different age groups. The following section outlines key findings from this study.

Findings

Again, the research questions for this study asked: (1) what were the attitudes held by key stakeholder groups about the new test leading up to its implementation?; (2) what is the relationship between students' computer access/comfort and their perceptions of the new test?; and (3) how did these programs plan to address emerging student needs and adequately prepare these individuals for earning their high school equivalency via the GED?

All Participant Groups Were Skeptical of the New Test

The major findings related to the first research question was a strong sense of skepticism among administrators, teachers, and students about the 2014 GED, particularly with regard to its new, computer-based format. Data used to answer this research question were drawn from interviews, focus groups, and the student survey. During interviews, administrators discussed at length the challenges associated with shifting from a paper-based to a computer-based test, as well as their concern over the increase in both cost and difficulty. When it came to sharing information with teachers, information appeared to be communicated fairly well. Four of the six instructors indicated that they were well-aware of the major changes to the test prior to the change. One teacher noted, "I learned about [the new test] in a training class I attended; "yet," she continued, "I was very dismayed to hear about these changes." Another teacher stated, "My guess is that most of [the students] don't even have access to the internet. From taking the test on the computer to the increased

cost, it just seems like it's one barrier after another that keeps students from being able to take [the new GED]." When asked how they reacted to learning about the move to a computer-based test, two teachers stated their first thought was, "Oh no!" Elaborating, one teacher explained, "[These students] may not know how to use computers and they may not know how to type. That may be something *else* that they have to learn before they can even do the test... and what they have to do to be able to pass." None of the administrators or teachers believed a computer-based test would be beneficial to the students currently served by these two programs.

In the survey, students were also asked directly what their opinion was about the new test, and many of the responses aligned closely with those shared by the administrators and teachers during interviews and focus groups, respectively. The top three response categories to the question, "What is your opinion of the new test?" generated a wide range of responses, as shown in Table 4, below. However, a majority of the responses to this item (which were the three most common general response categories), were related to student concerns about the cost of the test (23%), the difficulty of the test (19%), and testing on the computer (14%).

Students' Computer Use and Comfort May Present Additional Challenges

In the survey, students were asked several questions which related not only to their computer use and comfort, but also about computer-based testing. In order to answer the second research question for this study, student responses to these survey items were analyzed. Among respondents, 57.7% had some experience with computer-based testing, while 42.3% had none. Nearly half of students indicated a preference for paper-based testing (49%),

as compared to those with a preference for computer-based testing (26.6%); the remaining respondents indicated they did not have a preference either way (24.5%). Students also reported that, while many would be likely to take the test even if it were offered on a computer (78%), the rest would be unlikely to attempt the test at all (22%) if that was the only option. Moreover, the results of a chi square test show that students are more likely to take a computer-based test if they have a computer at home ($\chi^2 = 4.19, p < 0.05$).

Among survey respondents, 60.1% reported that they do have access to a computer within their home; an additional 32.2% indicated they could access a computer at the home of a friend or relative, the public library, work, or school, although 7% reported that were unable to access to a computer anywhere. Interestingly, even among those *with* access to a computer, 17.5% reported that they do not use it at all; 51% use a computer for 1-2 hours each week, 18.9% use it for 3-4 hours, 2.8% for 7-9 hours, and 9.8% use a computer for more than ten hours each week.

The analyses suggest that the overall comfort scores for various computer tasks varied by having a computer at home ($M = 3.0$); the difference between these two means was significant at the Alpha level ($p < 0.05$) in a t-test analysis. Older students were more likely to have lower overall comfort scores. The overall ANOVA main effect was found to be statistically significant ($F (3, 136) = 12.4, p < 0.01$). These disparities are particularly notable when comparing means for age groups separated as 39 and under and over 39. The mean differences were statistically significant ($p < 0.05$) across these two age groups in the Tukey Post-Hoc test. Table 5 includes the overall comfort score summary by age group along with the standard deviation for each.

The New Test Would Bring Inevitable Changes

In order to answer the third research question, which asked how these programs would need to change to meet new and emerging student needs, data from interviews, focus groups, and student surveys were used. Three important findings related to this question emerged. First, it is necessary that programs understand their students and the support they need. Second, both students and teachers desire additional training and support. Third, programs need to educate the community

The importance of understanding students and their needs. During interviews and focus groups, teachers and administrators were asked to describe the “typical” student in the program. Nearly all (both administrators and six of the teachers) stated it was “difficult to label them,” adding that “they come from all walks of life,” and “there is no typical student.” The teachers and administrators did describe some of the common challenges they face, however: “They all seem to come from some sort of struggle... and overcome something just to be [in the program].” Elaborating on that point, one administrator added, “Most of them have a full-time job and may have a family and they most likely have a low wage job so they have financial struggles.” A teacher attempted to explain the challenges they faced even in completing the program: “For some of them, this is their time for school, so when they come... this is their time... many of them do only what we accomplish here in our two hours twice a week.”

As administrators and teachers continued to describe the students, a sub-theme that emerged was one that described almost a different way of thinking for these students as they work toward earning their HSE diploma. As one focus group participant stated, “It’s like a guidance counselor in high school telling

[you] how to apply for college and all of that...[these students] have to have handholding." She continued by adding that she even goes with them to sign up for the GED because "sometimes they can't even walk into the GED office by themselves and sign up for the test. I have to meet them there and call them on the way to make sure they are coming to meet me." Other participants echoed these sentiments: "It's not like you're dealing with regular high school students that come in probably thinking they are going to go beyond high school. These folks don't think that way," while another added, "I just don't think they can see beyond tomorrow. They may think they're going to get their GED this year, but that's as far as it goes." Yet another participant made nearly the same point: "Our students... can't think about what they're going to do after they get their GED because... getting their GED is all they can focus on at the time." Two teachers described the sensitive nature of some of the students enrolled in the program, noting: "Anything that might discourage them from taking the test [results in] a definite possibility they would drop out of the program," and "[many students] are older and having to come back to school; it's hard, I think, to even motivate themselves to come to class."

During the teacher focus groups and administrator interviews, these participants were also asked to describe (1) how classes were currently structured and (2) what they believed students and teachers would need moving forward. Both of the administrators and three of the six teachers expressed a strong desire in helping students to develop their computer and technology skills. One of the teachers from the first focus group believed that students have a need for developing specific computer skills, such as keyboarding and "getting generally more accustomed to technology." Another teacher from the same group indicated that she was uncertain

if local programs were even set up yet for students to come in and take tests on the computer. A third teacher stated, "If [Program B] included some sort of training in using the computer, it would be a great thing for [the students]."

Desired training and support. Several survey items were included to: (1) gauge student interest in additional training and (2) determine the topics that were of the most interest. Among student respondents, 83.7% were "very interested" and 12.8% were "somewhat interested" in attending a class to help them prepare for their next steps after earning a high school diploma; only 3.5% expressed no interest in attending such a class. When asked about the topics they were most interested in, students indicated a strong preference for college and career-related services. The three highest-rated training or assistance programs were in the areas of: matching interests and skills with a job or career (65%), identifying an educational program to match interests and skills (61.5%), and simply learning how to search for a job (59.4%). Table 6 illustrates each area of interest and indicates the proportion of students indicating interest in the particular topic.

While students are the primary focus of a program and its services, teachers and administrators alike identified several resources and services that may benefit instructors, specifically. One focus group participant stated, "It would be beneficial to...get together the teachers around the county and maybe spend an hour or an hour and a half to talk about how we can go about teaching certain things. I would like to know... if there are other methods that people are using, and to have reinforcement about some of that." Three additional teachers agreed that this would be beneficial for them regarding their interactions with students. One of the administrators noted, "We don't have a lot of resources and pay a low wage [to

our instructors]. We'd like [the teachers] to have experience in education and an education degree, but we are flexible." Of the six teachers who participated in the focus group, none had a background and formal training in education.

Educating the community. When asked about how the new test may impact the program as a whole, the primary concern for the two administrators was how to most effectively use the limited resources available to best meet students' needs. Administrators were asked to share their opinions about having an alternative HSE test available in the state, such as the HiSET or TASC. The program's director stated that the biggest concern was simply "to help employers, schools, the general public, and even the students to understand that, in theory, [an alternative test] would be the equivalent to the GED... it won't hinder [students] if they have [the alternative diploma]. It's supposed to be the same thing, so a role that [programs] can play is to educate the community. What is this new test? What does it mean? Is it the same? What's different? ...Just getting people to accept that. All of the promotional materials say 'Get your GED and quote how many students don't have a GED, so I think it would be a mind shift [with] any new test." The following section discusses these findings and important implications for practice.

Discussion and Implications for Practice

The findings of this study raise five important topics of discussion. First, as the adult basic education landscape continues to change, it is important for scholars and practitioners to understand what drives these decisions. Second, given these ongoing changes, it is critical that programs do not lose sight of the needs of their students. While their end goal—to earn a high school equivalency diploma—remains

constant, these changes have resulted in new student needs which must be met in order to ensure their success both in and following their participation in a test preparation program. Third, just as students have had new training and support needs emerge, so have the teachers who work with these students every day. Fourth, it is critical that program administrators, staff, and teachers emphasize and value effective communication and regular sharing of information. Lastly, the importance of feedback and ongoing evaluation cannot be overstated.

Adult Basic Education Is Still Evolving

There is not yet sufficient information in the literature regarding the full scope of the decisions (and their resulting impacts) related to states which opted to proceed with the new GED, an alternative assessment such as the HiSET or TASC, or some combination of the three. However, one can reasonably assume that two of the major issues behind these decisions are (1) computerized testing and (2) increased stakeholder costs, which may be financial or perceived difficulties. As states continue to finalize their future plans for adult basic education programs, it is likely that issues related to computerized testing (e.g. infrastructure, cost of testing centers and maintenance, professional development for teachers, and costs of additional computer-related preparation for students) have and will continue to play a role in these decisions.

One of the objectives of this research was to better understand the attitudes held by ABE program administrators, teachers, and students in the face of the new GED test, which is available only on computer. This marks a critical issue that programs have had to address given that there is now no paper-based version available. By the time this study had concluded, fifteen states had opted to either switch to an alternative assessment entirely or offer multiple

options for students. By late 2014, there were still 35 states (plus Washington D.C.) still offering only the GED, leaving essentially no options for teachers and students in these states *except* to adapt to the change. Yet, as more time passes, these numbers continue to shift. This raises an important question for future consideration: what impact will the attitudes and satisfaction rates among administrators and teachers have in the remaining GED states? From fall of 2014 to summer of 2015, two more states ceased to offer the GED test. This is also of interest for instructors, as they are the primary point of contact for students and those who set the tone for the class and convey important information to students regarding test. As programs continue to fully adapt to the requirements and format of the new GED, it will be important to understand not only the ways in which administrators are thinking about the change, but also what additional services will be beneficial to students. It will also be of interest to know if, and to what extent, student attitudes, confidence and, of course, the computer literacy skills needed for testing will impact their performance on the new GED.

When examining perceptions toward the new test, it is also worthwhile to follow this information from the students' perspective. With regard to students' computer comfort and attitudes toward computer-based testing, the findings of this study were clearly consistent in some areas, but rather conflicting in others, to those reached by George-Ezzelle and Hsu (2006). The sampling and response rates of these two studies, indeed, were quite different; while George-Ezzelle and Hsu utilized a random, stratified sample and achieved a response rate of 11%, the researchers of the present study utilized a convenience sample and obtained a response rate of 64%. The proportions of students having some experience with computer-based testing was similar

(62% vs 58%) as were the proportions of respondents with computer access in their home (63% vs 60%) when comparing the results of George-Ezzelle and Hsu's findings with those of the present study, respectively.

However, in comparison to George-Ezzelle and Hsu's findings, the respondents in this study reported strikingly lower responses with regard to how many would prefer computerized testing (65.7% vs 26.6%). The only difference in the question was that this study included a "no preference" option to George-Ezzelle and Hsu's forced response. Nevertheless, even if all of the respondents in the present study who indicated they had no preference (24.5%) were moved to the computer-based preference response group, this number would be considerably lower. Further, while George-Ezzelle and Hsu's findings indicated that 96% of respondents would still be likely to take the test if it were available only on computer, this study's finding of 78% is notably less. The discrepancies in these findings suggest further investigation is needed into the attitudes of GED test candidates in terms of how many students may not even be entering a test preparation classroom as a result of their concerns about computer-based testing.

Students Have Emerging Interests and Needs

The data in this study also revealed that students do have clearly identified needs with regard to developing their skills and abilities. While findings indicated that the teachers and administrators in this particular context underestimated student technology skills and access to computers, there are still technology-related services from which students could clearly benefit. Students expressed a strong interest in developing their skill sets and acquiring information about continuing education and future

careers. These are important considerations for adult education programs as they continue to adjust to the new GED test (or alternative assessment), particularly as new student needs are continually realized. This desire for training supports the findings derived from Quigley, Patterson, and Zhang's (2011) study of 75 students who transitioned from their GED credential to postsecondary education. In their discussion, the authors noted, "[students] would have benefited from clearer, more timely information on the local postsecondary institutions—perhaps from the GED test preparation program or GED Testing Center—even before they knew they had passed the test" (p. 11).

Programs that opt to make technology training courses available in the future should consider a variety of topics and workshops designed to further students' skill development. For example, some students may have a basic understanding of computer use, but could benefit tremendously from an introductory typing class; those who are less experienced with computers would likely need a beginner's level covering basics such as cutting, pasting, and using a mouse.

Across the areas of postsecondary education, career and employment assistance, and life skills and personal development, the topics of interest reported in this study could serve as a starting point for these kinds of offerings for the programs not already providing such options. Yet another consideration programs may want to keep in mind is to incentivize students to participate in these types of training options. Many ABE programs have traditionally paid a portion or all of the testing costs for a student to obtain his or her GED. One option would be to offer a testing cost scholarship to students who complete the additional training. For example, some programs may only have enough funding to pay 50% of the

testing costs for students. In the event these programs receive a grant or additional state funding to offer new computer classes; perhaps a portion of that funding could be set aside to cover some or all of the remaining portion of the testing cost for students who participate in and complete the training. This possibility was being considered in Program B at the close of this study.

Teachers Also Need Support

It should also be noted that the instructors who participated in this study had not completed any professional development or received any instructional support training with the exception of a brief orientation workshop when they made the commitment to work with GED students. Research in the field of adult basic education suggests that this situation is not unique. That is, other studies have demonstrated that many ABE instructors do not hold education credentials, may lack a thorough understanding of the testing content, and oftentimes have not received any training or education in working specifically with adults (Belzer, 2005; Smith & Gillespie, 2007). Therefore, it is recommended that program administrators consider the type of information, training, or support that would be most useful to instructors and integrate this into their orientation. It would also be beneficial to create opportunities or support participation in professional development regarding subject matter and content, as well as effective teaching strategies. In certain cases, it could prove beneficial to develop a volunteer skills assessment to optimize placement and matching with students based on volunteer preferences and student needs.

Effective Communication and Sharing Information Benefits Everyone

The findings of this study also indicated that students may need additional information with regard to program changes. Prior to the transition to the new test, students received information from their teachers about updates in the class and the future of the GED. While much of the information students did receive was accurate, student *and* teacher responses indicated that incorrect information had been shared and repeated, suggesting a possible need for additional, formal information updates directly from the program itself. However, given that many students reported not having a computer in their home and thus greater difficulty in accessing web-based information, programs should consider alternative ways of conveying this and other updates to students. This could take the form of a program representative coming to the class to talk to students, informational handouts created by a program administrator or representative, or periodic mailings sent to students' home addresses. In any case, it is necessary that programs identify an effective strategy for conveying complete and accurate information to students, as well as the community, in a way that is easy to understand and supports program goals. As this study has demonstrated, not all students will be able or know how to access this information online.

As previously noted, the two programs that participated in this study already partner to some extent. However, there are other programs in close proximity, bringing additional opportunities for partnering in other areas as well. Some of these areas could include: the development and maintenance of lessons and classroom materials, volunteer/teacher exchanges, shared professional development opportunities, and seeking new joint program funding. Further, if one service provider is already offering additional student training or support, it

may be possible to consider cost sharing by moving the class location to other programs in order to avoid the duplication of efforts and service. Programs that already collaborate may be able to identify new ways to work together and reduce costs in times of constrained budgets. As the two programs that participated in this study and countless others across the country adjusted to the changes brought by the new GED test, seeking such opportunities may be not only beneficial, but necessary.

Feedback and Evaluation Are Critical

Finally, the use of ongoing program assessment and evaluation is one way of addressing the issue of effective communication, as well as other important areas of concern such as: understanding the student population, generating meaningful data for seeking program funding and support, identifying program areas that could be improved through redesign or eliminated, and addressing other specific areas of concern within an organization or program. Smaller-scale program evaluations can be an effective and methodical way of addressing applied research questions pertaining to program improvement (Bloom, 2010). Through regular assessment and evaluation, programs can enhance communication with staff, participants and other stakeholders, as well as check assumptions about the needs and preferences of students and teachers. As mentioned in the findings, the teachers did not accurately gauge the extent to which students had access to computers or how comfortable they were using computers. Collecting feedback from students, teachers, volunteers, or community partners can be an effective way of checking such assumptions. The methods employed in this study could serve as one model for other programs interested in collecting information from key stakeholders.

Conclusion

The primary limitation of this research was the low participation from Program A's supervisor and staff. Without having sufficient participation from the administration and teachers at program A, it cannot be known how this input would have changed the context of the study. While the high student participation from Program A certainly contributed much important information from the student perspective, it would have been valuable to have had the opportunity to include these other individuals. Although the participation in the focus groups involved six of seven teachers from Program B, teachers from Program A were absent from these groups, possibly limiting the discussion or omitting perspectives that were not considered among those who participated.

It will be useful for future research to investigate attempt and pass rates across states, particularly comparing those offering one or more alternative assessment. Other researchers may want to consider the ways in which states only offering the GED have and continue to address the challenges associated with technology integration in the classroom and enhancing student preparation to take a computer-based test. Lastly, given the discrepancies between this research and that of George-Ezzelle and Hsu's (2006) study, more research will be needed in student use, comfort, and access to computers, and the way that this impacts their participation in computer-based testing. ♦

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Table 1—High School Equivalency Tests by State

Test	States	Total
GED only	AL, AK, AZ, AR, CO, CT, DE, FL, GA, HI, ID, IL, KS, KY, MD, MI, MN, MS, NE, NC, OH, OK, OR, PA, RI, SC, SD, TX, UT, VT, VA, WA, WI, & Washington D.C.	33 states + D.C
HiSET only	IA, LA, ME, MA, MO, MT, NH	7 states
TASC only	IN, NY, WV	3 states
GED + HiSET	CA, NM, NC, TN, WY	5 state
All 3 tests	NJ, NV	2 states

Note: Participation in each testing program was confirmed directly via each provider in June 2015

Table 2—Demographic Characteristics of Survey Participants

Variable	Category	Proportion %
Gender	Male	33.6
	Female	55.9
	Missing	10.5
Age	Under 29	55.3
	30 - 39	22.7
	40 - 49	9.2
	50 or older	12.8
Highest grade	8th grade or below	9.7
	9th grade	17.2
	10th grade	20.8
	11th grade	30.6
	12th grade	15.7
	High school diploma	6.0
Native English speaker	Yes	85.1
	No	14.9
Number of dependents	No dependents	36.5
	1+ more dependents	63.5
Employment	Full-time employed	35.3
	Part-time employed	13.5
	Unemployed	51.2
GED enrollment	Less than 4 months	71.4
	5-8 months	15.0
	9-12 months	6.4
	More than a year	7.2

Table 3—Computer Task Items: Level of Comfort

Survey Item	Mean	SD
Surfing the internet	3.0	1.3
Sending and reading email	3.0	1.3
Typing a letter or story	2.5	1.4
Creating a resume	2.1	1.3
Chatting with instant messenger	2.6	1.4
Shopping online	2.2	1.6
Using social media (Facebook, etc.)	2.9	1.5
Playing computer games	2.8	1.5
Searching for information	3.2	1.2
Entering data or information	2.8	1.3
Using a handheld computer mouse	3.2	1.3
Cutting, copying, and pasting	2.6	1.4
Playing and watching videos	3.1	1.3

Table 4—Responses to “What is Your Opinion of the New Test?”

General Response Category	Respondents	Proportion (%)
Concerned about the cost	30	23.08
Concerned about the difficulty	25	19.23
Concerned about testing on a computer	18	13.85
Does not know anything about the new test	9	6.92
Concerned about the timeline/rollout of test	8	6.15
Overall negative feelings	7	5.38
Mixed feelings (both positive and negative)	6	4.61
Overall positive feelings	6	4.61
Believes the new test is more modern	4	3.08
Would like the test to stay the same	3	2.31
Glad the new test will be easier	2	1.54
Has no concerns about the test	2	1.54
Believes the change is unfair	2	1.54
Does not understand the change	2	1.54
Believes the new test is a bad idea	1	.77
Does not want the class location to change	1	.77
Believes people will be less motivated	1	.77
Just wants to earn a GED	1	.77
Likes that the test will be more difficult	1	.77
Concerned about class attendance policy	1	.77
<i>Total Responses to this item</i>	<i>N = 130</i>	<i>Total = 100%</i>

Table 5—Average Overall Comfort Scores by Age Group

Age group	Mean	SD
Under 29	3.1	0.9
30 - 39	2.7	0.9
40 - 49	2.2	1.2
50 or older	1.8	1.1

Table 6—Student Interest in Training Topics Beyond the GED

Question Category	Item Summary for Individual Topics	% Interested
College and Continuing Education Topics	Identifying a program that matches my interests/skills	61.5
	Help completing college applications	51.7
	Learning about financial aid and paying for college	50.3
	Learning about vocational or training programs	37.8
	Learning about college programs	35.7
Employment, Career, and Job-Related Topics	Matching my interests and skills with a job or career	65.0
	Searching for and finding a job I want	59.4
	Practicing my interviewing skills	41.3
	Help completing a job application or resume	35.0
	Learning more about professional dress & behavior	27.3
Life Skill and Personal Development Topics	Computer and Technology skills	53.8
	Goal-setting and making good decisions	51.7
	Improving communication and people skills	47.6
	Managing Money (budgeting, opening accounts, etc.)	36.4
	Time Management Skills	30.1

Appendix—Adaptation of George-Ezzelle & Hsu's (2006) Computer Comfort Survey

Questions 4-12.
At the time you took your last GED Test, how comfortable were you performing the following functions?

	Very Uncomfortable	Somewhat Uncomfortable	Somewhat Comfortable	Very Comfortable	I never performed this function.
4. Using email to communicate with others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Playing computer games	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Using a word processing program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Creating drawings on the computer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Creating tables, charts, or graphs on the computer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Finding information on the Internet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Talking in chat groups or instant messaging with other people	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Filling out forms, surveys, or applications on the computer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Ordering merchandise online	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The figure above comes directly from George-Ezzelle and Hsu's instrument.

The items below were adapted from those above and used in the present study's survey on computer comfort:

	Very Uncomfortable	Somewhat Uncomfortable	Somewhat Comfortable	Very Comfortable	I have never done this
8. Surfing the internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Sending and reading email	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Typing a letter or story	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Creating a resume	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Chatting with instant messenger (using chatrooms)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Shopping online	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Using social media (Facebook, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Playing computer games	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Searching for information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Entering data or information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Using a handheld computer mouse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Cutting, copying, and pasting text	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Playing and watching videos	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>