



CASE STUDY:

Using SkillsTutor for Adult Basic Education in Minnesota

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I. Introduction

This case study will look at the statewide implementation of Houghton Mifflin Harcourt's SkillsTutor learning solutions in Minnesota's Adult Basic Education (ABE) distance learning program. Since November 2009, more than 310 teachers and 4,700 students throughout Minnesota have taken advantage of SkillsTutor's offerings.¹ The ABE students who use SkillsTutor are primarily preparing for the General Educational Development (GED) exam or Accuplacer tests, or they are filling knowledge gaps before starting college. These users are not consistently in the classroom so their use of SkillsTutor relies on their own levels of motivation and their teachers.

Administrative reports available from SkillsTutor and statewide usage data available from the SkillsTutor database are used in this study to evaluate the impact SkillsTutor has had on Minnesota's ABE learners. In addition to these quantitative data, ABE instructors and administrators, as well as the Minnesota SkillsTutor implementation team, were interviewed to better assess how SkillsTutor solutions have worked in practice.

Based on product usage data, this paper finds that adult distance learners in Minnesota improved their scores on SkillsTutor activities making it easier for teachers to address the gaps in students' knowledge.² ABE participants who used SkillsTutor products made gains across the subject areas in key topics they need to master. This study also finds that a student's instructor can have a positive effect on his or her outcomes on SkillsTutor activities; however, the amount of time spent on activities was not a significant indicator of how well a student scored. In addition to these findings, this study profiles the most popular SkillsTutor content used by Minnesota's ABE instructors and the gains of students across the different regions of the state. Teacher reactions to the software, its implementation, and the content are also discussed.

II. Data and Methods

Two reports provided important usage data for this case study: one administrative report from the SkillsTutor system—the Teacher Usage report—and a gains report that was created for each region of the Minnesota implementation.

Teacher Usage Report

This report lists all teachers and displays the number of classes teachers create, the number of unique students enrolled, the number of assignments created, the number of assignments currently active, an approximation of the number of activities completed, and the time-on-task for completed activities.

Gains Report

For all the activities students have completed in a region, this report lists the subject, pretest scores, posttest scores, and the gains in the scores.

Student-blind data provided by SkillsTutor database analysts made it possible to run correlations

¹ These numbers are based on the Teacher Usage reports run in early May 2011 for each region of the ABE implementation. The five regions are East Metro, Northern, Southwest & Southeast, Twin Cities, and West Metro.

² There are five types of activities in SkillsTutor: Basic Skills lessons, High-Order Thinking Skills lessons (H.O.T.S.), posttests, pretests, and quizzes.

between variables to determine teacher and time-on-task impacts, as well as to evaluate usage variance across the entire state. The data included usage information of all students active in the system as of May 2011. By replacing student names with random numbers, students were not identifiable, but it was possible to determine their assignments, teacher(s), scores, time spent on particular activities, and when they completed assignments. The subjects, topics, types of assignments, and activity names were also indicated. Based on the data from the SkillsTutor database, there were 116 teachers and 2,761 students actively using the system in the spring of 2011.

The Minnesota Literacy Council provides a great deal of support to Minnesota's ABE program and their implementation of SkillsTutor solutions. Susan Wetenkamp-Brandt, the Educational Technology Trainer for the Minnesota Literacy Council, identified seven instructors she thought would be helpful for this case study. She sent them an email asking them to contact the CS4Ed researcher about their integration of SkillsTutor. Four responded and each participated in phone interviews of approximately 30 minutes in early May 2011. At every interview, instructors were asked if they could recommend another instructor to be interviewed. Only one additional instructor was identified in this way.

Based on SkillsTutor's Teacher Usage reports, 16 additional instructors were identified as high-end users, and an email was sent to this group requesting that they contact the researcher. From this pool of instructors, only an additional two agreed to be interviewed. Given time constraints, these teachers were sent the questions via email. The questions used during the phone interviews and those sent via email are listed in Appendix A.

The limited number of respondents to interview requests is most likely due to the time of year. April and May are very busy times for instructors as the spring term is coming to an end and instructors, as well as students, are preparing for summer vacations. In total, there were eight teachers from four of the five Minnesota regions informing the findings of this case study.

III. Adult Basic Education in Minnesota

The mission of the Minnesota Department of Education's Adult Basic Education program (MDE-ABE) is to "provide adults with educational opportunities to acquire and improve their literacy skills necessary to become self-sufficient and to participate effectively as productive workers, family members, and citizens."³ An important part of fulfilling the ABE mission is to provide adult learners with opportunities to learn in non-traditional settings so they can continue to juggle work, community, and family responsibilities. Web-based, distance learning programs such as SkillsTutor provide ABE students with the flexibility to work from home or wherever they can access the Internet.

Organized into over 50 consortia or service areas throughout the state, the ABE program has hundreds of delivery sites located in public schools, workforce centers, community/technical colleges, prisons/jails, libraries, learning centers, tribal centers, and non-profit organizations. The consortia are organized into five regions in Minnesota: East Metro, Northern, Southeast & Southwest, Twin Cities, and West Metro. Each region has a professional development coordinator who is supposed to "promote best practices to improve student and system performance."⁴ Instructors at the public schools are licensed teachers who are required to have a college degree in ESL. In 2010, about three-fourths of all ABE teachers were part-time and, to better serve students, thousands of volunteers are trained to

³ http://mnabe.themlc.org/Adult_Basic_Education2.html.

⁴ http://mnabe.themlc.org/Regional_Professional_Development.html.

serve as literacy tutors.⁵ When ABE instructors or volunteers want to use SkillsTutor, they contact the Minnesota Literacy Council to get their login and, based on their program's consortium, are assigned to one of the regions within the system. Within the SkillsTutor management system, each region is administered separately so administrative reports are run regionally.

Each ABE location can have its own curriculum, but it has to include classes and programming for at least one of the following core content areas: reading, writing, math, speaking, listening, ESL, or GED/diploma. Some use SkillsTutor solutions as a supplemental resource in the classroom, while others use it strictly as a distance-learning program. A third alternative is the blended learning approach, where students receive some guidance in a classroom but then work independently at a distance and at their own pace. For ABE students to be considered distance learners, at least 50% of their time has to be outside of the classroom setting.

Whether preparing for the General Educational Development (GED) exam or Accuplacer tests that determine college readiness, supplementing their class work, or generally honing their skills in particular subject areas, ABE students must meet the following criteria:

1. Be 16 or over
2. Be unenrolled in secondary school
3. Be functioning below the 12th grade level in any of the basic academic areas including reading, math, writing, and spoken English

ABE students using SkillsTutor solutions independently have to score 4.0 or higher on the Test of Adult Basic Education (TABE) or score 211+ on the Comprehensive Adult Student Assessment System (CASAS). The TABE is aligned to SkillsTutor content so instructors can quickly target where students were weak on the TABE and make assignments accordingly. CASAS, a test geared more to non-native English speakers, is not aligned to SkillsTutor solutions.

IV. Findings

When asked to rate SkillsTutor as a distance-learning product on a scale from 1 to 10, the instructors who were interviewed and surveyed gave scores between 7 and 10; the average of all responses was an 8. Instructors were most pleased that they could identify students' knowledge gaps and then use SkillsTutor solutions to target their assignments. One respondent from East Metro said that she was "very impressed with what SkillsTutor has to offer, the accessibility it offers to students, and the ease that I can access reports." She continued, "Most of my students have been very positive about SkillsTutor. The few students that have signed up and then not participated in SkillsTutor or only done it briefly have lacked all-around motivation."

Another instructor, also located in East Metro, said, "Most of my students have liked working on SkillsTutor." An instructor/trainer in the Twin Cities region saw results: in six months, one of her students who was only using SkillsTutor to prepare for her GED went from a grade 6 reading level to a nearly grade 10 reading level. In the Northern region, one instructor had a student who already had a high school diploma but probably got it before standards and mandates. The student wanted to go to college but did not think she was ready, so she used SkillsTutor and now "she knows more about percents and she has said that it has really helped her improve."

⁵ "Overview of Adult Basic Education (ABE) in Minnesota – FY2010." Published by the Minnesota Department of Education. http://www.commissions.leg.state.mn.us/ehwg/09282010_ABE.pdf.

Student Improvement

The average gains Minnesota’s ABE students made between their SkillsTutor pretest scores and their posttest scores from January 2010 to January 2011 are listed in Table 1.⁶ Based on the subjects assigned in SkillsTutor, students are making the greatest gains in Algebra, followed by Intermediate Mathematics and Writing. Clearly, students are improving within the SkillsTutor program. See Appendix B for a compiled, statewide gains report that profiles regional variance in gains as well as averages by subject.

Table 1. State Pretest to Posttest Gains by Subject⁷

Average Regional Gains*	Subject
85%	Algebra
38%	Intermediate Mathematics
37%	Writing
34%	Reading Comprehension C
33%	Math B
31%	Language Arts A
30%	Basic Mathematics
29%	Language
29%	Reading
28%	Math C
26%	Reading Comprehension B
22%	Workforce Readiness Skills
20%	Language Arts B
20%	Reading Vocabulary C
17%	Language Arts C
16%	Reading Vocabulary B
12%	Math A

N = 2,705 students; 119,771 activities

* Gains are calculated by the percent of improvement on the Posttest relative to the Pretest $[(\text{Posttest}-\text{Pretest})/\text{Pretest}]$

As discussed above, pretest-to-posttest gains show that students working on Algebra improved the most. However, based on ABE usage data, only 1% of the activities completed by ABE students were in Algebra (see Table 2). To see where SkillsTutor is having the greatest impact, looking at the gains in the most popular activities is more revealing. As indicated in Table 2, Language Arts A, B, and C and Math A are getting the most use—a combined 53% of all completed activities come from these subjects—and as shown in the highlighted rows from Table I gains in these areas are on average 23% in Language Arts and 12% in Math A. In Language Arts A, the most assigned subject in SkillsTutor by ABE instructors, students are making a remarkable 31% gain in their posttest scores relative to their pretest scores.

⁶ Of those students who took a pretest, 52% went on to complete a posttest.

⁷ These results are based on the data in the Gains reports run by Achievement Technologies from 1/18/2010 – 1/18/2011.

Table 2. Regional Comparison of Subject Usage

Note: The three subjects with the most activities completed in each region are emphasized.

Subject	Region ⁸					Total ⁹	% of Activities
	EM	N	S	TC	WM		
Language Arts A	8,416	5,533	1,801	6,104	7,498	29,352	19%
Language Arts B	5,557	2,242	957	8,106	4,767	21,629	14%
Language Arts C	5,103	1,015	461	3,539	3,715	13,833	9%
Math A	3,553	2,622	1,737	6,046	3,592	17,550	11%
Intermediate Mathematics	2,901	1,933	198	1,350	2,500	8,882	6%
Basic Mathematics	1,699	3,076	221	3,640	2,976	11,612	7%
Reading Comprehension A	1,656	1,565	108	2,331	1,611	7,271	5%
Math B	1,645	1,518	308	1,364	3,703	8,538	6%
Writing	1,559	1,741	159	3,502	1,252	8,213	5%
Language	1,374	2,916	535	342	1,798	6,965	4%
Reading	1,324	2,148	60	2,564	1,896	7,992	5%
Reading Comprehension B	946	291	9	628	626	2,500	2%
Reading Vocabulary B	743	688	47	247	764	2,489	2%
Algebra	609	136	1	267	267	1,280	1%
Math C	531	253	156	641	1,949	3,530	2%
Reading Vocabulary C	410	367	22	237	653	1,689	1%
Workforce Readiness Skills	192	944	147	371	166	1,820	1%
Math Fact Fluency: Addition	1	-	-	-	-	1	0%
Reading Comprehension	1	-	-	-	-	1	0%
Science I	1	-	-	-	-	1	0%
	38,221	28,988	6,927	41,279	39,733	155,148	100%

It is noteworthy that just four topics account for 45% of the activities assigned by ABE instructors:

- Capitalization (13%)
- Punctuation (13%)
- Spelling (10%)
- Usage (9%)

All of these topics are in Language or Language Arts A, B, or C. Another 19% of the completed activities come from six topics in Math A (Understanding Numbers, Using Addition and Subtraction, Using Decimals and Fractions, Using Geometry, Using Multiplication and Division, and Working with Data) and two topics in Basic Mathematics (Number Concepts and Computation). See Table 3 for a profile of the most popular topics.

⁸ The regional abbreviations are as follows: EM = East Metro, N= Northern, S= Southwest & Southeast, TC= Twin Cities, and W= West Metro.

⁹ These 155,148 activities were completed by 2,761 ABE students.

Table 3. Most Activities Completed by Topic

Topic	Frequency	Percent	Cumulative %	Subject
Capitalization	20,205	13.02%	13.02%	Language, Language Arts A, B, C
Punctuation	19,587	12.62%	25.65%	Language, Language Arts A, B, C
Spelling	15,458	9.96%	35.61%	Language, Language Arts A, B, C
Usage	14,202	9.15%	44.76%	Language Arts A, B, C
Understanding Numbers	7,140	4.60%	49.37%	Math A
Number Concepts	4,736	3.05%	52.42%	Basic Mathematics
Vocabulary Building	4,161	2.68%	55.10%	Reading
Using Addition and Subtraction	3,778	2.44%	57.54%	Math A
Using Geometry	3,645	2.35%	59.89%	Math A
Computation	3,517	2.27%	62.15%	Basic Mathematics
Using Multiplication and Division	3,505	2.26%	64.41%	Math A
Introduction to Algebra	3,463	2.23%	66.64%	Intermediate Mathematics
Language Mechanics	3,370	2.17%	68.82%	Writing
Using Decimals and Fractions	3,192	2.06%	70.87%	Math A
Using Fractions and Percents	2,851	1.84%	72.71%	Math B
Proportion and Percent	2,844	1.83%	74.54%	Intermediate Mathematics
Word Knowledge	2,338	1.51%	76.05%	Reading
Grammar and Usage	2,327	1.50%	77.55%	Language
Using Whole Numbers	2,242	1.45%	79.00%	Math B
Early Civilizations	1,951	1.26%	80.25%	Reading C
Word Problems	1,892	1.22%	81.47%	Basic Mathematics
Language Usage	1,835	1.18%	82.66%	Writing
Working with Data	1,720	1.11%	83.76%	Math A
Sentence Structure	1,707	1.10%	84.86%	Writing
Using Decimals	1,545	1.00%	85.86%	Math B, C
Reading Comprehension	1,493	0.96%	86.82%	Reading
Measurement and Geometry	1,467	0.95%	87.77%	Basic Mathematics

N=155,148 completed activities

All of the interviews and surveys with instructors revealed that SkillsTutor solutions have helped them better address gaps in students' knowledge. All were very happy that they could make assignments based on TABE correlations. By looking at students' TABE results, instructors can identify students' weak areas and then use SkillsTutor to assign practice on those skills. Once the assignments are made and completed, teachers greatly appreciated the SkillsTutor reports that indicated student scores on activities and their progress.

Importance of Instructors

This study also finds that a student's instructor can have a positive effect on a student's outcomes on SkillsTutor activities. The statewide data from the SkillsTutor system indicates that there is a significant and positive correlation between a student's scores and the student's teacher—about 4% of student results can be attributed to their instructor. Accordingly, training teachers to use SkillsTutor effectively with adult students should be part of the implementation strategy moving forward.

V. Teachers' Reactions

Teachers' Review of the Software

The comments below are exact transcripts of teacher feedback.

A. Making Assignments

- I LOVE the way it selects the TABE standards and assigns the activities.

B. Reports

- I like that I can see problem areas quickly and that I can pull up the lessons from the reporting.
- I think what I like most of all about SkillsTutor is that it is really easy to get into the program as an administrator to see what students are doing.
- I like that I can go in and see if the student is working.

C. Lessons

- I like the way the lessons work—I think they are engaging [and provide] a lot of opportunities for users to learn.
- The way the graphics are works for me—it is really good and simple. For some of our learners, computers aren't their thing and the [SkillsTutor] interface is really friendly. You don't have to navigate through a bunch of stuff.
- I like that I can assign the lessons to them specifically—I am in control.
- I like that the lessons take you to a small screen and you can easily navigate back to the original page.

D. Activity Assessments

- Not everyone is a computer learner so keep it short! Don't give them [students] a lot of questions and that is why I like SkillsTutor because the tests are not too long—8 or 10 questions. I used KeyTrain but it was too wordy and long.
- I like that it gives the students what frame they are on. If, for example, SkillsTutor says it is the 6th question out of 10—students don't have to wonder, "When will I ever be done with this?"

Teachers' Review of the Content

A. Language versus Reading

Most of the teachers interviewed stressed that they used SkillsTutor to focus on Language more than on Reading skills. According to one instructor, students who are using SkillsTutor based on their TABE scores tend to improve their Language scores more than their Reading. Language skills tend to benefit more because SkillsTutor has lessons on basic grammar, sentence and paragraph structure, commas, and capitalization. The Reading Comprehension activities, however, use a different approach than what the teachers tend to use in the ABE program. One instructor described the ABE approach as being less metacognitive up front and more directed toward the content students are going to read.

Another ABE instructor in the Southern region echoed this sentiment. Before students get to the reading content, SkillsTutor has them work through a pre-reading strategy where students are supposed to make predictions by clicking and dragging three sentences into a box. Once the sentences are in the box, the student is then supposed to type a sentence. For this feature, students

seem to need extra training. To compensate, some instructors do a pre-reading activity such as discuss the content of the reading passage before students begin reading.

Another issue instructors mentioned with the Reading Comprehension content is that the passages are long and students need to scroll down with a little button to continue reading and some students do not see all of the reading passages because they do not see the scroll bar. Though this is more of an issue with students' computer skills, the resulting perception is that Reading Comprehension can be difficult.

Nevertheless, several of the instructors mentioned liking the Reading Comprehension component of SkillsTutor. Further, overall Reading Comprehension gains within SkillsTutor are remarkable. The Reading along with the Reading Comprehension B and C subjects together make up 12% of completed activities (see Table 2) and have an average gain of 30% between the Pretests and Posttests (for details on student gains, go to Table 1 or Appendix B).

Overall, there appears to be a strong preference by teachers for Math and Language over Reading Comprehension activities.

B. Mathematics

In the Math content area, the word problems were liked, and one teacher said that the Geometry section was good for helping students learn the vocabulary they need for the GED Math test. Another teacher stressed that SkillsTutor math instruction works best if students are “not being introduced to the concepts for the first time.” In the area of fractions, for example, teachers felt the concept of a numerator and a denominator were not well explained, and it is assumed that students already know the difference. SkillsTutor is evidently better for providing a review of materials than for presenting new information.

C. Workforce Readiness Skills

The Workforce Readiness Skills content was also well received, but because it was not useful for passing the GED or helping students prepare for college, it was not used very much—only 1% of the assignments for ABE users were from the Workforce Readiness Skills subject.

D. TABE Correlations

The TABE correlations received very positive feedback, but lower reading levels (grades 2–3) were not considered to be as accurate as reading lessons for upper reading levels (grades 6–8). One instructor indicated that the lessons for grades 2–3 are somewhat difficult and thought that having more lower level lessons would be helpful.

E. Adult Usage of Content Geared for Children

Even though these were adult learners and SkillsTutor is designed for use in the middle and high school market, there were no concerns about the text being too childish or the graphics too young. As one teacher commented, “Some of the screens are obviously made for children and not for adults but my adults don't seem to mind too much.”

VI. The Challenge of Implementing SkillsTutor

In fall 2009, Minnesota added SkillsTutor to its list of approved Web-based platforms for its distance learning Adult Beginner Education program.¹⁰ Beyond answering SkillsTutor questions in the “Frequently Asked Questions” section of their Web site, the Minnesota Department of Education’s ABE program primarily promotes SkillsTutor via emails, word of mouth, or teacher-training. Trainings have taken place both in-person at a local setting or virtually, as web-based seminars or webinars. As part of the training, teachers are set up with logins and they learn to register students. According to Susan Wetenkamp-Brandt, the instructors who have not gone to a training session but who want to use SkillsTutor are generally self-selecting, distance learning instructors or coordinators who contact her themselves for logins and passwords or have an administrator do it for them.¹¹ Often, more experienced colleagues or supervisors lead instructors to the SkillsTutor program if they have found it useful in their work.

Having Wetenkamp-Brandt as a point person for SkillsTutor in Minnesota has been an important part of the implementation’s success. She took over the coordination of logins for ABE in the summer of 2010. By having a single point person on the client side of the implementation, it was clear to ABE instructors whom they should contact to get an account. If they struggled with integrating the system into their teaching, however, they would usually turn to colleagues. (See the Professional Development section below for more details.)

The use of SkillsTutor by Minnesota’s ABE instructors varies. Based on unique logins as of May 2011, it would appear that most instructors are based in the Northern region followed by Metro West, while the most students are located in the Twin Cities region. However, due to instructors sharing logins in the Twin Cities region, this data may be misleading.

Table 5. Regional Profile of Users

Region	Number of Instructors Interviewed or Surveyed	Total Number of Current and Active Instructors	Most Active Use Based on Completed Activities	Total Number of Current and Active Students
Metro East	2	17	38,221	455
Metro West	0	26	39,733	583
Northern	1	31	28,988	642
Southwest & Southeast	1	19	6,927	147
Twin Cities	4	23	41,279	934
Total	8	116	155,148	2,761

¹⁰ The other Web-based, distance learning products the ABE program approved are: A+dvancer, Apex Learning, Inc., Ellis Academics, English for All, GED-i, KeyTrain, Learner Web, Lifetime Library, Mindquest, National Work Readiness Credential, Plato Learning Environment, and USALearns. http://mnabe.themlc.org/Approved_Distance_Learning_Programs_in_Minnesota.html.

¹¹ Susan Wetenkamp-Brandt, interview by author, May 2, 2011.

Professional Development

Nearly all instructors who were interviewed indicated that the PDF User Guides provided by SkillsTutor were “OK” but not sufficient for helping implement the program. Screencasts developed by Adam Kieffer and another colleague at the Hubbs Center for Lifelong Learning in the Central Metro/Twin Cities region were mentioned repeatedly as the most helpful support for SkillsTutor use.¹² There are five screencasts that instructors at the Hubbs Center developed:

- 1) Login/Select TABE Standards for ABE
- 2) Create Classes
- 3) Create Assignment
- 4) Enroll & Edit students
- 5) Viewing Reports

These were made at the end of 2009 and have been useful to teachers when they are first learning how to use SkillsTutor. One teacher went so far as to write the following in an email: “THANK GOODNESS FOR ADAM KIEFFER [sic] at the Hubbs Center who answered a ton of my questions and who made those fabulous instructional videos.”¹³

Generating reports, because of the many options available, was one area of concern for Kieffer and his colleagues. The reports were especially important because proxy hours (the number of hours that are fundable for ABE) depend on the Student Detail report. For the instructors at the Hubb Center who are sharing logins and classes, pulling the proxy hours together is tedious because there are so many students and assignments to examine every month. Instructors with fewer students are able to manually tabulate the proxy hours without much trouble. The users at the Hubbs Center, however, would like to see the number of completed activities and passing scores in one report.

One instructor has been tempted to create a SkillsTutor FAQ sheet for her colleagues and students but has not yet had the time. Another instructor said that she had once tried to contact SkillsTutor’s phone support but found the wait long and the help desk attendant unhelpful. (The attendant did not recognize the ABE client and did not seem qualified to answer the instructor’s questions.) For this instructor, exploring SkillsTutor on her own proved most useful, and she plans to teach colleagues what she has learned.

VII. Conclusion

Recently, the Hubbs Center coordinators and instructors completed a study called “Hubbs Center for Lifelong Learning Report on Persistence in Distance Learning Study.” They found that follow-up by ABE instructors is an important factor for keeping adult students engaged in their program.¹⁴ Accordingly, ABE is going to start requiring distance learners to have an email address so instructors

¹² “The Ronald M. Hubbs Center for Lifelong Learning (Adult Basic Education) is a program of the Saint Paul Public Schools’ Community Education Department. Educational services are available to adults who want to improve their basic skills, earn a GED, prepare for employment or post-secondary education, or learn English.” http://hubbs.spps.org/General_Information.html.

¹³ Recognizing this need, SkillsTutor will roll out screencasts that help train on the teacher program in summer 2011. Go to <http://skillstutorvideos.com/> to view them.

¹⁴ This study was completed in May 2011 by Erica Lehner, Adam Kieffer, Julia Tabbut, and Jenifer Vanek of the Hubbs Center in Saint Paul, Minnesota.

can contact them more easily, and will ask students to sign a contract committing them to four hours a week of distance learning time. There are also plans by ABE to include SkillsTutor in a hybrid class curriculum that would have students do some work in a class or lab setting and some at a distance so that instructors can provide more consistent support. Following one class carefully would be an insightful way to verify and perhaps to isolate the impact SkillsTutor can have on adult student learners.

The data used from the SkillsTutor database was limited for this case study due to student and teacher login sharing throughout the ABE program. Consequently, it was not possible to determine which activities or teachers were having the greatest impact, or how much activity repetition helps struggling students. In a more controlled implementation, it would be possible to assure unique student and teacher logins and subsequently conduct a more comprehensive analysis of the data.

Even with these limitations, though, based on the improvement between their pretest and posttest scores, ABE students are making remarkable gains within SkillsTutor. The instructors they work with are having a positive impact on their scores, and the instructors interviewed for this case study are very satisfied with their SkillsTutor experience. One instructor commented, “SkillsTutor has been a valuable addition to my individualized ABE classroom. Students continue to learn on SkillsTutor while I am helping other students in the classroom. I can offer SkillsTutor to my students who learn best by doing hands-on activities. Some of my students have not used computers in the past and have learned computer basics while using SkillsTutor.” Thus, as a resource for instructors and a learning tool for students, SkillsTutor is fulfilling its intended purpose as a distance learning solution for Minnesota’s Department of Education’s ABE program.

Appendix A. Interview Questions

1. How did you first hear about SkillsTutor? When did you start using it? How do you primarily interact with the system?
2. How many and which SkillsTutor trainings have you been through? How were they helpful? What could have been better?
 - a. Have you used the screencast on the ABE literacy site?
3. How did you integrate SkillsTutor into your curriculum?
 - a. How did the CASAS and TABE requirements fit into your planning with the system?
4. Which subjects did you focus on with SkillsTutor?
 - a. Are there any lessons or activities that you were particularly impressed with?
 - b. Are there any that you were not happy with?
 - c. What are some of the strengths/weaknesses of the curriculum?
5. Which SkillsTutor features are your favorites? Which features are the weakest?
 - a. What are some of the strengths/weaknesses of the software (screens, functionality, layout, etc.)?
6. Have you used the Student Detail report for your proxy report? How long did it take for you to get the information you needed?
7. How have your students responded to SkillsTutor? Do you have any anecdotes you could share about how SkillsTutor has helped them? Are there any students you would recommend I speak with about their SkillsTutor experience?
8. How successful was the SkillsTutor implementation (based on student improvement, motivation, reports, your own use, etc.)?
9. On a scale of 1 to 10 (10 being best), considering all of the distance learning products you have used, where would SkillsTutor rank?

Appendix B. Compiled Gains Report for all of Minnesota

Subject	Pretest	Posttest	Gains ¹⁵	Region	Gains Rank	Average Subject Gains
Algebra	35%	68%	94%	N	1	85%
Algebra	25%	44%	76%	EM	2	
Basic Mathematics	55%	73%	33%	SW	25	30%
Basic Mathematics	56%	73%	30%	EM	29	
Basic Mathematics	66%	86%	30%	WM	30	
Basic Mathematics	63%	81%	29%	N	32	
Basic Mathematics	56%	72%	29%	TC	33	
Intermediate Mathematics	50%	82%	64%	TC	3	
Intermediate Mathematics	50%	74%	48%	WM	6	
Intermediate Mathematics	57%	79%	39%	N	18	
Intermediate Mathematics	53%	69%	30%	EM	31	
Intermediate Mathematics	40%	44%	10%	SW	69	
Language	50%	67%	34%	SW	22	29%
Language	51%	67%	31%	EM	27	
Language	55%	69%	25%	WM	37	
Language	58%	72%	24%	N	41	
Language Arts A	59%	82%	39%	SW	17	31%
Language Arts A	62%	83%	34%	WM	24	
Language Arts A	65%	85%	31%	TC	28	
Language Arts A	62%	79%	27%	N	35	
Language Arts A	64%	80%	25%	EM	38	
Language Arts B	60%	75%	25%	TC	39	20%
Language Arts B	66%	80%	21%	N	48	
Language Arts B	67%	81%	21%	WM	50	
Language Arts B	68%	80%	18%	SW	58	
Language Arts B	65%	76%	17%	EM	59	
Language Arts C	62%	75%	21%	SW	49	17%
Language Arts C	68%	82%	21%	TC	52	
Language Arts C	70%	84%	20%	WM	53	
Language Arts C	67%	76%	13%	EM	62	
Language Arts C	72%	80%	11%	N	67	
Math A	71%	82%	15%	TC	60	12%
Math A	73%	83%	14%	EM	61	
Math A	79%	89%	13%	SW	65	
Math A	75%	83%	11%	N	68	
Math A	77%	83%	8%	WM	70	
Math B	55%	78%	42%	SW	10	33%
Math B	59%	80%	36%	WM	20	
Math B	56%	75%	34%	EM	23	
Math B	56%	72%	29%	TC	34	

¹⁵ Gains are calculated by the percent of improvement on the Posttest relative to the Pretest $[(\text{Posttest}-\text{Pretest})/\text{Pretest}]$

Subject	Pretest	Posttest	Gains ¹⁵	Region	Gains Rank	Average Subject Gains
Math B	62%	77%	24%	N	40	
Math C	55%	77%	40%	SW	15	28%
Math C	47%	64%	36%	TC	19	
Math C	66%	83%	26%	WM	36	
Math C	53%	59%	11%	EM	66	
Math C	53%	59%	11%	EM	66	
Reading	58%	83%	43%	WM	8	29%
Reading	44%	62%	41%	EM	13	
Reading	52%	70%	35%	TC	21	
Reading	60%	73%	22%	N	46	
Reading	62%	66%	6%	SW	73	
Reading Comprehension B	48%	68%	42%	WM	11	26%
Reading Comprehension B	56%	74%	32%	N	26	
Reading Comprehension B	56%	69%	23%	EM	43	
Reading Comprehension B	55%	58%	5%	SW	74	
Reading Comprehension C	61%	91%	49%	N	5	34%
Reading Comprehension C	61%	87%	43%	WM	9	
Reading Comprehension C	56%	69%	23%	TC	44	
Reading Comprehension C	54%	66%	22%	EM	45	
Reading Vocabulary B	72%	85%	18%	EM	55	16%
Reading Vocabulary B	73%	86%	18%	WM	57	
Reading Vocabulary B	75%	85%	13%	TC	63	
Reading Vocabulary B	78%	88%	13%	N	64	
Reading Vocabulary C	56%	78%	39%	EM	16	20%
Reading Vocabulary C	67%	83%	24%	TC	42	
Reading Vocabulary C	75%	91%	21%	WM	47	
Reading Vocabulary C	81%	87%	7%	N	71	
Reading Vocabulary C	76%	81%	7%	SW	72	
Workforce Readiness Skills	56%	79%	41%	N	12	22%
Workforce Readiness Skills	58%	70%	21%	TC	51	
Workforce Readiness Skills	59%	61%	3%	EM	75	
Writing	51%	82%	61%	WM	4	37%
Writing	45%	66%	47%	N	7	
Writing	44%	62%	41%	TC	14	
Writing	42%	50%	19%	SW	54	
Writing	50%	59%	18%	EM	56	

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