



MY Access![®] Efficacy Report

Vantage Learning
110 Terry Drive Suite 100
Newtown, PA 18940
www.vantagelearning.com

August 2006

© 2006, Vantage Learning. All Rights Reserved.

MY Access!® Efficacy Report

Overview

This report details the efficacy of MY Access!®, a web-based instructional writing product developed by Vantage Learning. The report begins with an overview of the MY Access! program and a sampling of the research that was used as a basis for the development of the program. Next, the report describes how IntelliMetric™ works and provides data regarding its scoring reliability and validity. Lastly, case studies and feedback provided by school districts across the globe are provided as examples of the typical experience using MY Access!.

Description of MY Access!

MY Access! is a web-based instructional writing product that provides students enrolled in grade 4 through higher education with the opportunity to develop their writing skills within an electronic portfolio-based environment. Teachers can create a writing assignment from a large pool of prompts covering grades 4 through higher education including narrative, persuasive, informative, literature, and expository genres. In order to provide an integrated writing instruction tool, the prompts are aligned to major textbook series, are aligned to state standards, and provide cross-curricular writing opportunities in areas such as science, math, and social studies. In addition to the prompts available in MY Access!, teachers may create their own prompts for use in the system.

Teachers may guide the students through pre-writing activities and review exemplar papers for the prompts available within MY Access!. Students can receive feedback from the system during the writing process as well as upon submission for a score based on the MY Access! rubric. After submitting an essay, the student receives immediate feedback from IntelliMetric and can also receive feedback from his/her teacher.

MY Access! provides both a holistic (overall) score and analytical scores in the areas of Focus and Meaning; Content and Development; Organization; Language, Use and Style; and Mechanics and Conventions. For students who are native Spanish or Chinese speakers, the feedback can be provided in the native language at the teacher's discretion.

An online portfolio is maintained for every student using MY Access!. All original drafts, scores, revisions, comments from teachers, reflective journal entries, and IntelliMetric feedback are accessible at any time. Teachers and administrators are also able to view these portfolios at the individual, class, school, or higher aggregate level.

In addition to the online portfolio of student responses, scores, comments, journals, and teacher comments, MY Access! provides additional writing instruction materials and tools.

Students have access to a variety of tools:

- Writer’s checklist to help guide the student through the writing process
- Scoring rubrics so the students can self-assess their writing through the process
- MY Editor to provide grammatical comments, suggestions, and explanations of rules. This tool is available at multiple levels of difficulty and language in order to be most effective for the student.
- Word counter to keep track of essay length
- Word banks to assist in the selection of appropriate words for use in an essay of a particular genre
- Spell checker to assist in the proper spelling of words used in the essay
- Venn diagrams and other graphical pre-writing tools to assist in the formulation and organization of ideas to be included in the essay

Teachers have access to a variety of reports to view the students’ writing and feedback in almost any manner. In addition, the teacher has ultimate control over the tools available to the students while writing essays. For example, if it is important that the students do not receive any help with spelling, the spell checker can be turned off for any particular assignment. Also, the teacher has final control over the scores provided to the student. If the teacher wishes to adjust a score provided by MY Access, the teacher can enter in the final score in addition to specific feedback.

Administrators also have access to customized reporting to obtain frequency distributions, historical summaries, and roster reports.

Summary of Writing Instruction Research

“The research is crystal clear: schools that do well insist that their students write every day and [are] provided regular and timely feedback.” (National Commission on Writing 2003)

Students learn to write by writing. Studies have shown that the amount of writing that students complete is positively related to tests of writing ability (Chircop 2005, Coe et al. 1999, Boersma et al. 1997, Cotton 1988). Writing intensive programs, requiring multiple drafts and a high volume of written work, such as those using writing portfolios or software to leverage success in writing, have been particularly effective in increasing writing aptitude across a wide range of students of varying abilities (Chircop 2005, Boersma et al. 1997). *MY Access! provides the opportunity for students to write and receive feedback much more frequently than using traditional methods of writing instruction.*

Research has also shown that timely feedback is essential in increasing writing ability. Studies have indicated that when feedback is received often and in the early stages of writing, it is more likely to be judged by the student as valuable. This feedback will have a positive effect on the quality of the writing (Cowie 1995). *MY Access! provides this timely and appropriate feedback to help increase student writing proficiency.*

Dr. Robert Marzano (2001) has widely published a set of key research-based factors for successful instruction. In addition to timely feedback as noted above, another one of these

critical components is the use of clear learning objectives. *MY Access!* provides the detailed scoring rubrics as well as commentaries on exemplar papers so that students are aware of what is required to meet each learning objective. Teachers can set clear instructional goals for a student, such as: “Submit at least four drafts to the prompt and earn a score of at least 4 out of 6 on the final submission.”

Another key research-based strategy for instructional success defined by Marzano includes the use of “nonlinguistic representations” (Marzano, Pickering, & Pollock 2001). *MY Access!* provides students with graphical tools such as Venn Diagrams and concept maps to use in pre-writing activities to help organize and develop the content of the essay to be written.

In order to provide immediate feedback to students, MY Access! utilizes IntelliMetric, Vantage’s proprietary automated essay scoring system. Students are able to revise essays based on the feedback received and re-submit for a new evaluation of the essay. This process of writing, receiving feedback, continuing to revise, and receiving more feedback has been shown repeatedly to be a necessary process for writing proficiency improvement. The value of MY Access! would be limited without the implementation of the immediate and accurate IntelliMetric feedback.

Overview of IntelliMetric™

IntelliMetric is an intelligent scoring system that emulates the process carried out by human scorers and is theoretically grounded in the traditions of Cognitive Processing, Computational Linguistics and Classification. The system must be “trained” with a set of previously scored responses containing “known score” marker papers for each score point. These papers are used as a basis for the system to infer the rubric and the pooled judgments of the human scorers. Relying on Vantage Learning’s proprietary CogniSearch™ and Quantum Reasoning™ Technologies, the IntelliMetric system internalizes the characteristics of the responses associated with each score point and applies this intelligence in subsequent scoring.

IntelliMetric is based on a blend of artificial intelligence, natural language processing and statistical technologies. It is essentially a learning engine that internalizes the characteristics of the score scale through an iterative learning process. In essence, IntelliMetric internalizes the pooled wisdom of many expert scorers. It is important to note that artificial intelligence is widely believed to better handle “noisy” data and develop a more sophisticated internalization of complex relationships among features than human scorers.

IntelliMetric is trained to score essays much the same way as expert human raters are trained. Experts are provided anchor papers specific to the prompt, are given scores to those papers, and are taught why each paper should receive a certain score. The human raters are given additional scored papers for training and are ultimately asked to score some papers on their own. If the human scoring is acceptable with regards to the standard, the human rater is then allowed to score new essays for that particular prompt. Similarly, IntelliMetric is trained using a set of essays which have already been scored. This training allows the scoring engine to recognize what discourse elements of an essay written to a specific prompt are desirable. The IntelliMetric engine learns what it means to be an essay earning each score point on the rubric. As a result of

this training, a prompt-specific model is created. This model can be used to score essays submitted to that prompt.

Every IntelliMetric model in MY Access has gone through this rigorous process starting with expert human scoring, training, and validation. If the new model meets the criteria of acceptable performance data (measured in terms of agreement with experts), the model is available for use to provide immediate scoring in MY Access.

Summary of IntelliMetric Research

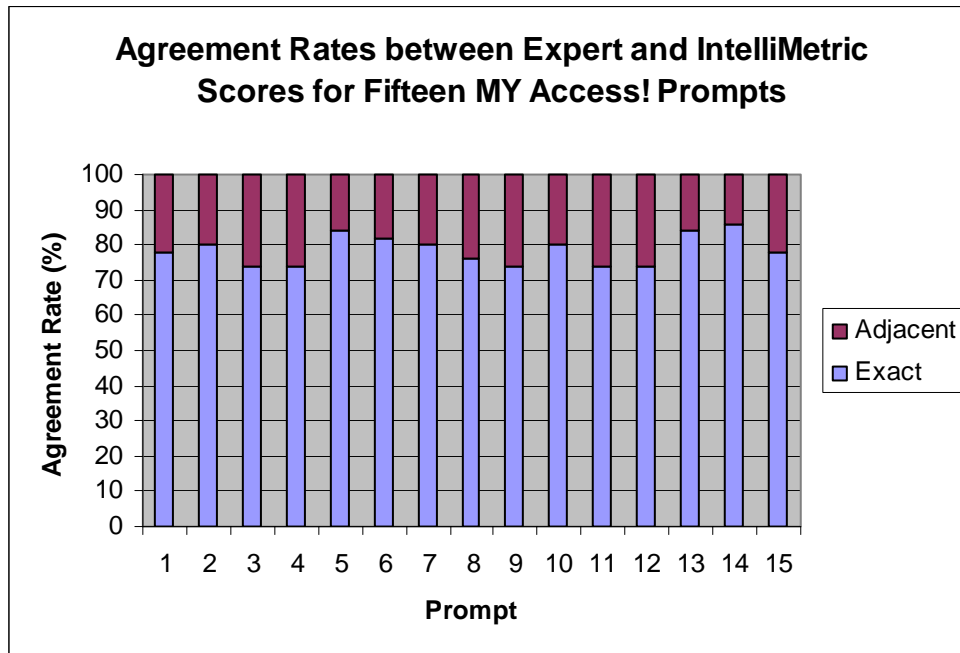
More than 300 studies evaluating IntelliMetric performance data have been conducted. Typically when evaluating the quality of an IntelliMetric model, the means of the humans compared to the IntelliMetric model are compared, the agreement rates are calculated, and the Pearson correlation between the scores is calculated. If the means are not significantly different, the agreement rates meet a benchmark of acceptance, and the Pearson correlations are strong, the model is considered acceptable for use. A description of the major types of studies conducted and a summary of results are provided below.

Comparison of IntelliMetric and Expert Scores on Validation Sets

The scores assigned by IntelliMetric and the scores assigned by human experts for the same set of essays have been compared. In these cases, the set of essays used for validation purposes were not used in the training set for IntelliMetric. This provides a true comparison of blind scoring by IntelliMetric compared to scores provided by an expert(s).

A sampling of IntelliMetric agreement data is shown in Figure 1. For fifteen prompts developed recently, the percentage of exact agreement and percentage of adjacent agreement (within 1 point) on a 6 point scale are shown. While this sampling of model data has all models showing 100% agreement within one point, the larger pool of data indicates that ***IntelliMetric agrees with a final expert score within 1 point typically between 97 to 100% of the time.*** For models used in MY Access!, the typical standard of agreement is at least 70% exact agreement and 100% agreement within one point. Models that show more than 2% discrepancies (more than one point difference from the expert) are not approved for use in MY Access!.

Figure 1



The Pearson correlations for these same fifteen prompts are shown in Table 1. The higher the positive correlation (which can range from 0 to 1), the more associated the data values are with each other. The Pearson Correlations are all extremely high, ranging from 0.91 to 0.96. This indicates that there is a very strong positive relationship between IntelliMetric scores and human scores for every prompt. For models used in MY Access!, the typical minimum Pearson correlation is 0.80. Any model not achieving this benchmark will not be approved for use in MY Access!.

Table 1

Prompt	Pearson Correlation
Essential Job Skills	0.94
Mandatory Recycling	0.95
Marlowe & Raleigh	0.91
Principal for a Week	0.92
A Visit to the Rainforest	0.96
After-School Job	0.95
Backpacks	0.95
A Dinner Menu	0.94
Emphasis on Sports	0.94
An Empty Room	0.95
Life Without Electricity	0.93
Soda Machines	0.92
A Special Day	0.96
Sports Teams	0.96
Student Leader	0.95

Comparisons between Expert Agreement and IntelliMetric/Expert Agreement

We have also investigated how often two experts agreed on what score to assign an essay and compared that to how often IntelliMetric agreed with the experts. We have compared IntelliMetric to the experts in studies looking at K-12 students, college admissions candidates, higher education students, and graduate school admissions candidates, to name a few. In most cases, IntelliMetric was more likely to agree with either expert than two experts were to agree with each other. For example, when we looked at student responses to an eighth grade writing test, IntelliMetric scores agreed with the experts about 98% of the time; the two experts agreed with each other 96% of the time. These findings vary somewhat from study to study, but all in all, we typically have found that IntelliMetric agrees with experts about 95% to 100% of the time—about as often or more often than experts agree with each other. ***IntelliMetric agrees with expert scores as often or more often than two experts agree with each other.***

“True Score” Study

Another way we verified that IntelliMetric works was to compare the scores assigned by IntelliMetric to the average score across many experts. We assumed that the average score of about 8-10 experts was a good estimate of the “real” score for an essay. We looked at how often IntelliMetric agreed with the average expert score and found that the scores assigned by IntelliMetric agreed with the average scores significantly more often than any individual expert’s score agreed with the average score. In fact, not one of the individual experts did as well as IntelliMetric in comparison to this average score. ***IntelliMetric was found to more closely match a “true score” than any single expert rater’s score.***

External Correlation Studies

The fourth major way we have looked at IntelliMetric is in comparison to other ways of measuring writing and language skills. In other words, we asked: Does IntelliMetric tend to agree with the evaluations of student skills offered by other measures such as multiple choice tests, independent teacher judgments, etc.? We found that IntelliMetric agreed with teachers’ judgments of student writing, student SAT scores, multiple choice writing tests and several other instruments as well if not better than the scores assigned by experts agreed with these measures. ***IntelliMetric scores correlate with other measures of the writing construct.***

The studies of IntelliMetric scoring accuracy have shown that IntelliMetric:

1. Agrees with expert scoring, often exceeding the performance of expert scorers
2. Accurately scores open-ended responses across a variety of grade levels, subject areas and contexts
3. Shows a strong relationship with other measures of the same writing construct
4. Shows stable results across samples

Independent Research Confirms the Accuracy of IntelliMetric

In addition to the research initiatives led by Vantage Learning to ensure that the IntelliMetric models are of highest quality for use in MY Access and for other programs, independent research has been conducted. Unfortunately, much of that research is considered confidential and cannot be disseminated.

A research study published in the Journal of Technology, Learning, and Assessment that was lead by Larry Rudner of the Graduate Management Admission Council recently confirmed the accuracy of the IntelliMetric engine (Rudner, Garcia & Welch 2005). Using essays drawn from over 100 different prompts, results indicated that IntelliMetric agreed within one point on a six-point scale with human raters on average over 97% of the time. This agreement rate was found to be slightly higher than the agreement rate between two human raters. As a result, the researchers concluded that IntelliMetric replicates the scores provided by human raters, providing superior agreement rates. IntelliMetric has been implemented for use in scoring GMAT® essays in conjunction with an expert rater.

MY Access! Case Study Highlights

Students in school districts that have implemented MY Access! have often attained substantial increases in writing ability. These increases are evident in higher scores achieved on state-mandated standardized tests as well as increased scores within MY Access throughout the school year. Students and teachers alike agree that the features and tools that MY Access! offers, such as instant holistic and domain scoring, and informative personalized feedback, allow students to continuously improve the quality of their writing.

There has been a multitude of success stories in school districts throughout the United States that have implemented MY Access! as part of an instructional writing program. Below is a sampling of data provided by school districts:

- At Birmingham High School, an economically disadvantaged school in the Los Angeles Unified School District, school-wide, 81% of students who used MY Access! passed the California High School Exit Examination, while only 46% of the students who did not use MY Access! passed the exam. The passing rate for the school as a whole was approximately 70%.
- At Edna Brewer Middle School, a school of primarily low-income students in the Oakland Unified School District, MY Access! was piloted in an attempt to increase scores on the California STAR Assessment. After only four months of use, the students' average holistic score on their essays rose one full point, increasing from a 3 to a 4. Initially, 55% of the students using MY Access! were deemed to be "At Risk" in terms of their writing proficiency. By the end of the program, this number had decreased by 16 percentage points to 37%. The percentage of students who were classified as attaining a "Mastery" level of writing increased from 3% to 9% by the end

of the program. The percent of students rated as “Proficient” writers also increased, from 42% to 54%.

- At Red Clay Consolidated School District in Delaware, selected students in elementary and middle schools piloted MY Access!. During the first year of use, those schools showed significantly higher levels of writing proficiency as measured by the DSTP Writing Performance Levels. Working with MY Access!, 86% of fifth-grade students who used MY Access! two or three times a week scored at Performance Level (PL) 3 or 4 on the DSTP; 67% of fifth-grade students who used MY Access! a total of five times or less scored at PL 3 or 4; whereas only 43% of fifth-grade students who had no exposure to MY Access! scored at PL 3 or 4. At PL levels 4 and 5, of eighth-grade students using MY Access!, 27% achieved PL 4 and 5% achieved PL 5; for students not using MY Access!, the differences are notable – these figures were 16% and 1%, respectively.
- At Bluff Ridge Elementary School in the Davis School District in Utah, three 5th grade classes incorporated MY Access! into their curriculum, while one class opted to solely use traditional instruction. Of the three classes using MY Access!, the average scores on the Stanford 9 standardized assessment ranged from 75.3% to 80.5%. The comparable class that did not use MY Access! achieved an average score of only 61.7%.
- School districts in Carbon and Lehigh Counties in Pennsylvania selected MY Access! in an attempt to improve the writing scores of students on the annual high stakes examination, the Pennsylvania System of School Assessment (PSSA). Students were given a pre- and post-test similar to the PSSA to gauge writing achievement. Of the 9th graders that were not proficient on the pre-test, 40% improved to proficient by the end of the study. Of those who did not have the benefit of using MY Access!, only 22% improved to proficient. One school in the study saw over 75% of below proficient students increase to proficient when using MY Access!. The study also showed that levels of proficiency increased the more students used MY Access! On average, low proficiency students with high MY Access! usage levels improved their post-test scores by 23%, with medium usage levels 18% and low usage levels 19%.
- At Corcoran High School in New York, students piloted MY Access!. The scores received on the writing assigned within MY Access! were compared to the scores given on the New York State English/Language Arts Exam. As the year progressed, performance growth was evident. On a four-point scale, 75% of students scoring a 1 on their 8th grade assessment improved their writing by at least 2 points. 92% of students scoring a 2 on their 8th grade assessment improved their writing by at least 1 point. 47% of students scoring a 3 on their 8th grade assessment improved their writing improved their scores to a level of 4, the highest possible score.

These are just a few examples of school districts with successful implementations of MY Access!. In every case, it is the teachers and administrators who make the program a success.

Teachers and Students Agree that MY Access! Improves the Quality of Student Writing

Numerous studies have shown that students and teachers agree that MY Access! is valuable for assisting students in writing. The combination of writing tools, such as MY Editor, along with instant scoring and personalized feedback, are cited as useful features for improving the quality of student writing.

- A study conducted by Vantage Learning shows that 91% of educators using MY Access! would advise others to purchase this program as an instructional classroom tool. Also, 85 percent of users view MY Access! as an effective tool for preparing for state-mandated assessments and 82 percent of users are satisfied with key features of MY Access!. In particular, the reporting tools were cited as an effective component of the program.
- A study conducted by Hoon (2006) indicated that students felt very positively about the use of MY Access!. Nearly 80 percent of the students felt that MY Access! had helped them improve their writing, and more than 90 percent indicated that they used the feedback provided to improve their writing. They found the online writing resources such as the user and writer guides, writer's model catalogue, quick reference guide, and instructional units useful. The feedback provided by My Tutor had helped them identify their weaknesses as it explained with examples. The teachers agreed that the most valuable features of MY Access! were the immediate feedback with scores and the potential to improve student writing through the use of various writing support tools.
- A study by Yang (2004) also finds that students enjoy using the features of MY Access!. Nearly 90 percent of students agreed that they liked the program because it allowed them to go back and revise their essay, with about 85 percent of students reporting that they liked receiving a score instantly after submitting an essay. About 80 percent of students liked having their own portfolio and the personalized feedback which told them what they needed to do to get a better score. The teachers in this study found MY Access! to be very easy to use. They were confident that practicing writing using MY Access! would be helpful to improving students' writing.

Summary

There is no question that writing proficiency is a skill that every student must possess. MY Access! has been developed based on years of research regarding best practices for writing instruction. MY Access! has been shown to significantly increase the quality of writing for students of varying ability. Case studies confirm that students that use MY Access!, even for a short period of time, have demonstrated substantial gains within MY Access! as well as on state-mandated standardized tests of writing. In addition, both students and teachers alike agree that MY Access! is user-friendly. They report being satisfied with the high-quality of individualized feedback, the ability to maintain student portfolios, and the ease of revision. The rich writing instructional features coupled with the immediate feedback provided by IntelliMetric make MY Access! a very effective tool for use by teachers and students to drive writing proficiency improvement.

References

- Boersma, K., Dye, T., Hartmann, E., Herbert, L., & Walsh, T. (1997). *Improving Student Writing Through Student Self Assessment*. Retrieved July 12, 2006, from ERIC database.
- Chircop, J. (2005). *Student Achievement Soars with Use of Quality Strategies*. Retrieved July 12, 2006 from <http://www.asq.org/economic-case/markets/pdf/kingsley.pdf>
- Coe, P., Keys, M., Meehan, M., Orletsky, S., Lewis, S., Rigney, S., et al. (1999). *Development and Validation of Successful Writing Program Indicators Based on Research in Continuously Improving and Continuously Declining Schools: Report of the Kentucky State Writing Project Study of Writing Instruction in Kentucky Schools*. Retrieved July 12, 2006, from ERIC database.
- Cotton, K. (1988). *Teaching Composition: Research on Effective Practices*. Retrieved July 12, 2006 from <http://www.nwrel.org/scpd/sirs/2/topsyn2.html>
- Cowie, N. (1995). *Students of Process Writing Need Appropriate and Timely Feedback on Their Work, and In Addition, Training in Dealing with that Feedback*. Retrieved July 12, 2006 from, ERIC database.
- Hoon, T. (2006). *Online Automated Essay Assessment: Potentials for Writing Development*. Retrieved August 9, 2006 from <http://ausweb.scu.edu.au/aw06/papers/refereed/tan3/paper.html>
- Marzano, R., Pickering, D., & Pollock, J. (2001). *Classroom Instruction that Works: Research-Based Strategies for Increasing Student Achievement*. Association for Supervision & Curriculum Development.
- National Commission on Writing. (2003). *The Neglected R: The Need for a Writing Revolution*. Retrieved July 12, 2006 from http://www.writingcommission.org/prod_downloads/writingcom/neglectedr.pdf
- Rudner, G., Garcia, V., & Welch, C. (2005). *An Evaluation of IntelliMetric(TM) Essay Scoring System Using Responses to GMAT® AWA Prompts*. Retrieved August 9, 2006 from <http://www.gmac.com>
- Yang, N. (2004). *Using MY Access! in EFL Writing*. Paper presented at the 2004 International Conference and Workshop on TEFL & Applied Linguistics. Compiled by the Department of Applied English, Ming Chuan University, 550-564.