



From Dropout to Stand-Out

How Highland Park Career Academy improved student achievement for graduation with e2020



Introduction

The Education2020 (e2020) online learning program provides computer assisted learning systems, virtual classrooms, virtual laboratories, electronic field trips, e-mail, virtual tutoring, an online help desk, group chat sessions and non-computer-based activities facilitated by certificated teachers.

Despite 100% of students being classified as both low SES and at-risk, over 79% graduated from Highland Park Career Academy within the 2008-2009 school year-- nearly a 34% increase over and above the Detroit Public Schools graduation rate.

Since 1998, e2020 has successfully deployed online classroom programs in various settings to a wide range of middle and high school students representing various academic levels. Over one thousand schools throughout the United States utilize e2020 for a variety of purposes including core curriculum for middle and high school education, credit recovery, academic learning centers, grade recovery programs, fast track middle school programs, district virtual schools, and various alternative school models.

For the significant number of schools that have utilized e2020 as the core curriculum, those schools have solidly outperformed other traditional schools.

At the time of this study, e2020 was servicing more than 150,000 students in 39 states. Participating students range in skill from special education to fast track students who, in some cases, have obtained perfect scores on the SAT and ACT tests. Education2020 students consistently show increased academic gains when the program is implemented with fidelity.

Research Goal

The primary goal of this research is to compare the graduation rates of the Highland Park Career Academy to that of the Detroit Public School (DPS) system. This study will provide empirical evidence of improved student academic performance for those who had previously dropped out of DPS, but have now completed course credit and graduated from high school using the e2020 Virtual Classroom product. Further, quantitative research will be conducted and explanations will be postulated as to why some students did not graduate on time.

Of the students that had previously dropped out of Detroit Public Schools, 76% graduated from Highland Park Career Academy using e2020.

Educational Setting and Participants

The Highland Park school system is located six miles north of Detroit and includes two K-8 and one K-5 elementary schools, one 9-12 high school, and one adult education/career academy. Highland Park is a regional leader under the School of Choice provision serving 2,704 K-12 students, 1,400 students at Highland Park Career Academy (for 16-19 year olds), and 516 students in adult education. Students enrolled in Highland Park schools represent residents throughout Wayne County, Michigan.

The e2020 program began in the summer of 2002 as a pilot study for the Warren Consolidated School District. Based on the program's success, the Highland Park school system implemented e2020 into their own pilot program for 107 students seeking to recover course credits through the Highland Park Career Academy (HPCA). The HPCA used the e2020 Virtual Classroom to aid students in recovering course credits. These students also attended traditional classrooms to complete additional coursework.

The more time a student spent in the Virtual Classroom, the better chance they had at passing the class and thus graduating on time.

Participants in this paper were from a sample of 107 high school seniors and adult learners who were enrolled in a total of 510 courses during the spring and summer of 2009 at the Highland Park Career Academy. Students were signed up simultaneously to one or more of these courses consisting of 50 mathematics classes, 61 science courses, 201 literature classes, 70 social studies courses, and 128 elective courses (see Table 2 pg. 7 for a full list).

Students who had higher relative grades across all subject areas were more likely to graduate on time than students who had lower relative grades.

This research is somewhat unique due to the homogeneity of this sample of students. One hundred six of the 107 participants are African American and all students are of lower socioeconomic status (SES) as indicated by the school lunch program. A breakdown of this sample is displayed in Figure 1.

A simple observation of the histogram proportions from Figure 1 suggests a difference between ratios of: students classified as high school seniors or adult learners (grade), male or female (gender), and whether or not participants had previously dropped out of Detroit Public Schools (dropout from DPS); but do these differences in proportions suggest consequent differences in e2020 grades? A series of independent sample *t*-tests were conducted to assess differences among the e2020 relative grades for all three of these comparisons. Relative percent grades are calculated by the percent grade of completed activities in e2020, factoring in zeroes for all work that has not completed. This is considered to be the most rigorous of the three measures embedded within the e2020 program.

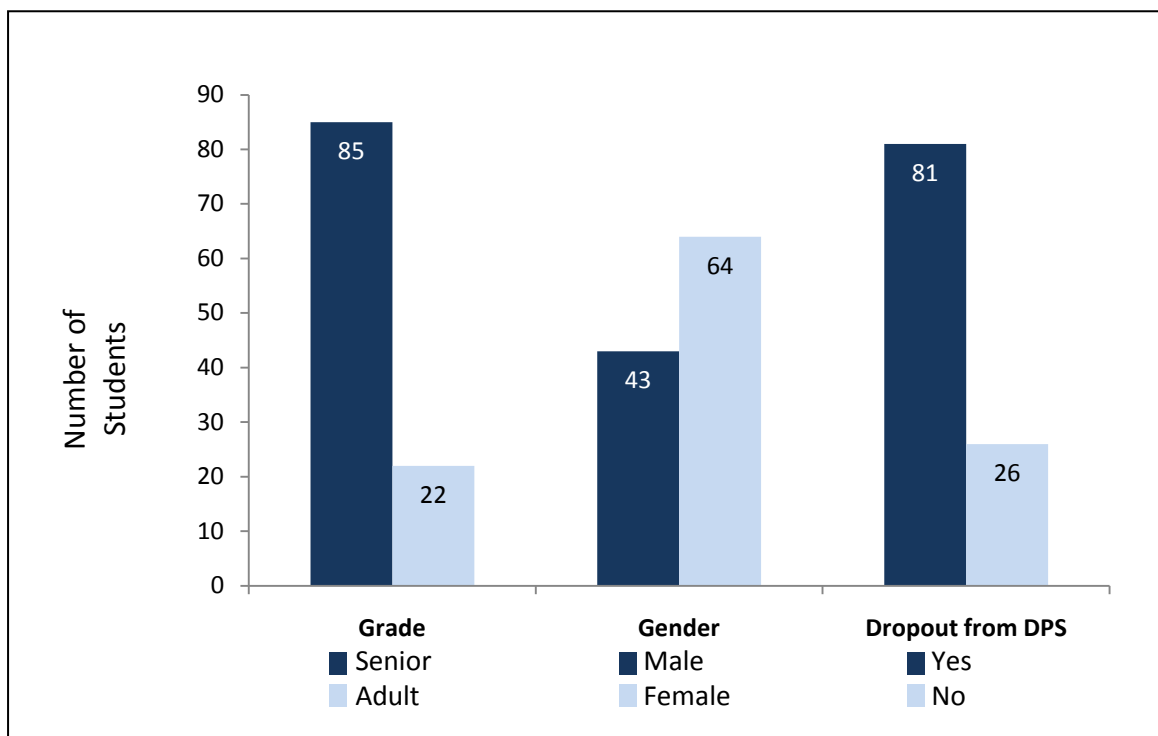


Figure 1. The number of students in the sample by grade, gender, dropout status from Detroit Public Schools.

The results of all three tests were not significant. On average, high school seniors ($M = 65.03$, $SD = 25.04$) had similar grades as compared to participants that were classified as adult learners ($M = 64.57$, $SD = 26.12$), $t(480) = .149$, $p > .05$. Similarly, male participants ($M = 67.25$, $SD = 23.62$) had comparable relative grades in relation to female participants ($M = 62.96$, $SD = 26.36$), $t(479.51) = 1.88$, $p > .05$ ¹. Finally, the students within the sample that were classified as former dropouts ($M = 56.11$, $SD = 32.17$) from the Detroit Public School (DPS) system had statistically similar grades to students that did not previously drop out of the DPS system ($M = 62.33$, $SD = 29.78$), $t(198.62) = 1.91$, $p > .05$ ¹. Although there was a high rate of former dropouts, low SES, and adult learners indicating a large percentage of at-risk students as classified by Michigan’s Department of Education, none of these variables seemed to make a difference in e2020 relative grades.

Results

According to the Detroit Public Schools district profile report², approximately 59% of African American students graduated from the district within the 2008-2009 school year. Further, nearly 54% of students within the district that were classified as low SES graduated on time. In order to test a comparison of our sample to that of the DPS, we counted the number of

¹ The Levene’s test for equal variances was violated, thus the correction was reported.

² Detroit Public Schools website: http://www.detroitk12.org.nyud.net/schools/reports/pdfs/district_profile.pdf

students that did and did not graduate and then converted them to percent values to normalize across groups.

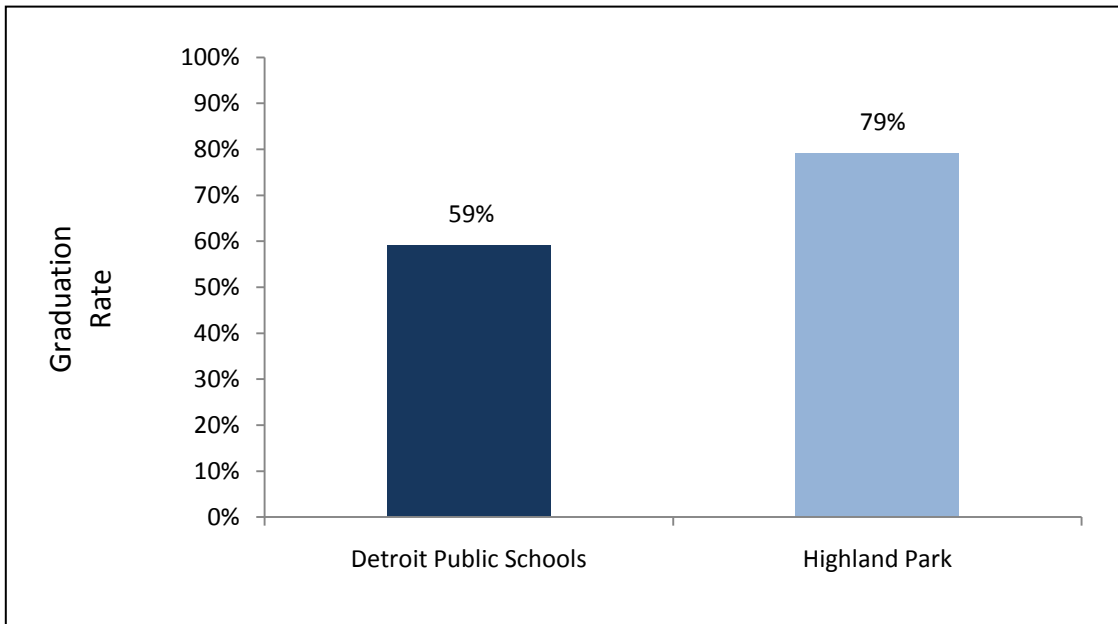


Figure 2. Rates of graduation of DPS students as compared to Highland Park students.

Despite 100% of students being classified as both low SES *and* at-risk, over 79% graduated from Highland Park using e2020. This is nearly a 34% increase over and above the district's graduation rate. Of the students that had previously dropped out from the DPS system, 76% (62 of 81 students) graduated from Highland Park using e2020 core courses.

A further analysis of these rates yields more compelling empirical data. An independent samples *t*-test was conducted to evaluate the hypothesis that courses taken by students who graduated on time tended to have higher relative percent grades in e2020 as opposed to courses taken by students who did not graduate on time. The test was significant, $t(508) = 10.788, p < .01, \eta^2 = .19$, courses taken by students who graduated on time ($M = 67.77, SD = 23.26$) had higher relative grades, on average, than courses taken by students who did not graduate on time ($M = 37.59, SD = 33.22$).

Despite these promising results, 23 of the original 107 students did not succeed in graduating on time³. Numerous possibilities exist that might have contributed to this event, but with the flexibility of the e2020 data system, we were able to confine these confounding variables to a minimal number of possibilities. In order to establish the relationship between e2020's calculation of relative percent grades and conditions students must meet in order to graduate, correlation coefficients were computed among the idle time and active time variables. Active time is the amount of time students spent progressing in their classes by watching videos,

³ Note: all 23 of these students are still enrolled in Highland Park Career Academy completing their e2020 courses for the 2009-2010 school year.

exploring interactive activities, journaling, working on homework within the Virtual Classroom, or taking quizzes and exams. Idle time represents the amount of time students are not actively progressing in their courses. Idle time includes the time students use to review and reflect on past work or reviewing reports, as well as the time they spent logged into the e2020 system and not progressing.

Correlation coefficients were computed among the four perceived relevant variables: graduation rate, relative percent grade, active time, and idle time. One of the most rigorous methods to control for Type I error is the Bonferroni approach⁴, thus a p -value of less than .008 (.05/6) was required for significance⁵. The results were statistically significant ($r = 0.43, p < .008$), relative grade ($M = 61.50, SD = 28.39$) was able to predict graduation rate ($M = 0.79, SD = 0.41$). Thus, 18.5% of the variance in graduation rate was accounted for by the variance in relative grades. In general, the results suggest that students who had higher relative grades across all subject areas were more likely to graduate on time than students who had lower relative grades.

| | Relative Grades | Active Time | Idle Time |
|-----------------|-----------------|-------------|-----------|
| Graduation Rate | .432* | .189* | .207* |
| Relative Grades | — | .228* | .270* |
| Active Time | | — | .455* |

Note: * The mean difference is significant at the .008 level.

Table 1. *Pearson's Product Moment (Zero Order) Correlations.*

A correlation coefficient was computed among the relative grade percent and active time in minutes. Using the Bonferroni approach to control Type I error, a p -value of less than .008 (.05/6) was required for significance. The results were statistically significant ($r = 0.23, p < .008$), active time ($M = 1757.28, SD = 1470.15$) was able to predict relative grade ($M = 61.50, SD = 28.39$). Further, a correlation coefficient was computed among the relative grade percent and idle time in minutes. Again, the results were significant ($r = 0.27, p < .008$), idle time ($M = 4436.82, SD = 28.6578$) was able to predict relative grade.

Because, the variance in active time accounted for 5.2% of the variance in relative grades, and the variance in idle time accounted for 7.3% of the variance in relative grades, it can be hypothesized that the overall time spent within the Virtual Classroom may be one of the

⁴ Olejnik, S., Li, J., Supattathum, S., and Huberty, C.J. (1997). Multiple testing and statistical power with modified Bonferroni procedures. *Journal of educational and behavioral statistics*, 22, 389-406.

⁵ We originally paired six-zero order correlations between graduation and relative grade, including active time and idle time.

primary contributors to students' relative grades in Virtual Schools. As a follow up, an independent samples *t*-test was conducted to evaluate whether total time (active time + idle time) was larger or smaller depending on whether students had graduated or not. The results indicated that the mean total time in minutes for students that graduated ($M = 6639.66$, $SD = 3858.94$) was significantly greater than the total time in minutes for students that did not graduate ($M = 4495.96$, $SD = 28.35$), $t(218.39) = 6.39$, $p < .01$ ⁶. The 95% confidence interval for the mean difference between the two ratings was 1481.99 to 2805.40. The variable that accounted for the most variance in student grades was the total time (in minutes) spent in the Virtual Classroom. Thus, the more time a student spent in the Virtual Classroom, the better chance they had of passing the class and graduating on time.

Conclusion

At first glance, this sample of students from Highland Park Career Academy seems to embody all of the predictors of students who are at-risk of graduating. The classification of 100% of students being economically disadvantaged, 76% of the students dropping out of the Detroit Public Schools system, and 21% of their students continuing education as adults all seem to be a detriment to this school's educational goal. Despite these classifications and hurdles, 79% of students were able to graduate on time, 76% of which had previously dropped out of the DPS system. Of the 23 students that failed to graduate on time, total time (time spent engaged in e2020 content) was targeted as the primary predictor of student achievement within e2020 courses. Finally, Highland Park Career Academy, with the help of e2020's Virtual Classroom, was able to increase their graduation nearly 34% higher than the Detroit Public Schools system for a similar sampling of students. As the Highland Park Career Academy students become more active in e2020's Virtual Classroom, their grades and overall graduation rates will rise substantially.

⁶ The Levene's test for equal variances was violated, thus the correction was reported.

| Row Labels | Count of Number | Row Labels | Count of Number |
|--------------------------------|-----------------|---|-----------------|
| Electives | 128 | Math | 50 |
| CA Day - Computer Applications | 9 | (SL) - CA Day - Algebra | 1 |
| CA Day - Consumer Skills | 2 | (SL) - CA Day - Geometry | 1 |
| CA Day - Consumer Skills | 42 | Algebra I - MA1101 | 1 |
| CA Day - Health | 30 | CA Day - Algebra | 16 |
| CA Day - Psychology | 11 | CA Day - Geometry | 23 |
| CA Day - Sociology | 11 | Geometry - MA1102 | 2 |
| Computer Applications - EL1083 | 1 | HPCA Algebra II (1st Quarter) | 1 |
| HPCA Career Skills | 3 | HPCA Geometry 1 | 2 |
| HPCA Computer Applications | 2 | HPCA Geometry 2 | 3 |
| HPCA Consumer Skills | 5 | Science | 61 |
| HPCA Consumer Skills 2 | 1 | CA Day - Biology | 9 |
| HPCA Health 1 | 1 | CA Day - Chemistry | 16 |
| HPCA Health 2 | 2 | CA Day - Earth Science | 13 |
| HPCA Psychology 1 | 2 | CA Day - Earth Science | 20 |
| HPCA Psychology 2 | 1 | HPCA Chemistry 2 | 1 |
| HPCA Sociology | 2 | HPCA Earth Science 1 | 2 |
| Sample Psych | 2 | Language Arts | 201 |
| Psychology - EL1119 | 1 | (SL) - CA Day Language Arts 11 (Amer Lit) | 1 |
| Social Studies | 70 | CA Day - English 10 | 17 |
| CA Day - Economics | 5 | CA Day - English 9 | 4 |
| CA Day - Government | 5 | CA Day - Language Arts 11 (Amer Lit) | 19 |
| CA Day - World History | 28 | CA Day - Language Arts 12 (British Lit) | 37 |
| CAD US History - SS1109 | 10 | CLN - A Midsummer Night's Dream LA805 | 26 |
| Economics - SS1111 | 1 | CLN - Call of the Wild - LA789 | 28 |
| HPCA Economics | 1 | CLN - Nineteen Eighty-four - LA791 | 24 |
| HPCA Geography 1 | 2 | CLN - The Three Musketeers - LA815 | 27 |
| HPCA US History 1 | 5 | HPCA English 1 | 2 |
| HPCA US History 2 | 4 | HPCA English 3 | 3 |
| HPCA World History 1 | 5 | HPCA English 4 | 2 |
| MS World History - SS1105 | 1 | HPCA English 6 | 3 |
| World History - SS1108 | 2 | HPCA English 7 | 4 |
| World History 1 - HP Summer | 1 | HPCA English 8 | 2 |
| | | Language Arts 12 - LA1094 | 1 |
| | | Sample English Course | 1 |

Table 2. *The Number of Subjects Parceled out by Specific Course.*

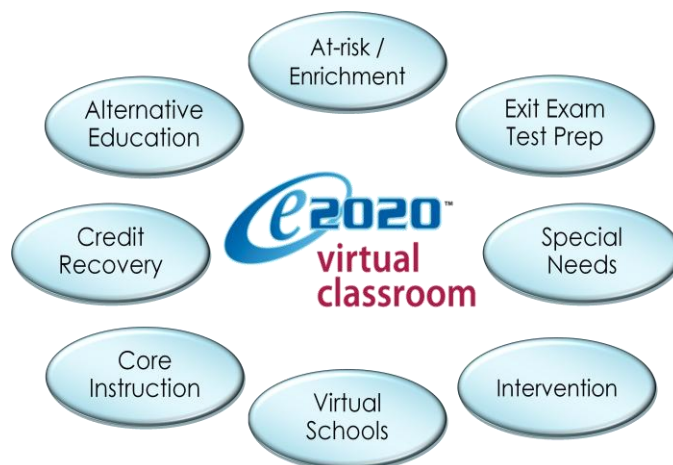
About e2020's Virtual Classroom Suite

The e2020 Virtual Classroom provides over 50 core and elective courses. Each course offers customized instruction for an individualized approach in which educators can set mastery levels, customize settings and offer a prescriptive study plan.

The e2020 course structure

The e2020 Educational Model for Learning embeds the principles of Universal Design for Learning (UDL)⁷ in its foundational framework. e2020's team of instructional designers, content area experts, and highly qualified teachers prepares for and constructs unique course scopes and sequences. By layering UDL principles and Quality Standards for Online Courses with the Southern Regional Education Board (SREB)⁸, e2020 has aligned all course content to each state's curriculum standards. e2020 designs each lesson with student-centered objectives that maximize the use of Bloom's Taxonomy of Learning Domains. Lessons are designed to provide students with an optimal learning experience unique to each course. Students progress through the lesson with a series of activities including: direct instruction videos taught by certified teachers; vocabulary instruction; interactive lab simulations; journals and essay writing; 21st century skill activities that include projects, design proposals, case studies, online content reading; and homework/practice preceding formative assessments. Topic tests and cumulative exam reviews are administered to reinforce content mastery prior to students' taking summative assessments.

For related evidence-based research surrounding the e2020 Educational Model, visit www.education2020.com/Evidence.



e2020's Targeted Solutions

⁷ <http://www.education.ky.gov/KDE/Instructional%20Resources/Curriculum%20Documents%20and%20Resources/Universal%20Design%20for%20Learning/>

⁸ <http://www.sreb.org/>