

**The New GED Option – A Way to Family Wage Jobs?**

BY

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Abstract:

This study argues that the increased rigor of the GED exam introduced in 2014 will improve post-secondary educational and employment outcomes for those test passers. Using ELS 2002 data the study shows that pre-GED 2014 recipients had post-secondary outcomes between high school graduates and dropouts. The study notes that GEDs who failed to complete a post-secondary training had incomes more like dropouts while GEDs who completed training had incomes more like high-school graduates. The study concludes that because the new exam requires increased academic preparation, instruction and association with competent adults, GED 2014 recipients will have acquired more of the behavioral traits associated with the conventional high school process that ends in graduation.

## Introduction

### GED 2014

The 2014 GED exam represents a massive shift from GED 2002 that was administered from 2002 through 2013, especially for teenagers in the GED Option Program that allows high school students to remain in school while pursuing the GED. Keeping in mind that the ultimate goal of high school and post-secondary is to get a job that provides a family wage, the new exam, GED 2014, addresses this issue by means of a radical alignment to the Common Core Standards that similarly attempt to improve the work and college readiness of typical high school students. This highlights the paradox of the sheepskin effect versus that of intellectual capital – is it the degree or the acquired skills that count?

Because the new exam is much more rigorous than any previous exam (GED Testing Service, 2014), demanding analysis of written text and practical application of algebra, geometry, statistics and probability, behavioral changes are anticipated within the younger GED group. The increased rigor demands more preparation and the expectation is that these GED recipients, by increasing math and language skills, will also have acquired the persistence trait leading to greater employment or improved post-secondary educational success. Importantly, post-secondary career readiness success is best measured by employment, defined in our study as annual income earned seven years after high school cohort graduation. The redesign is an explicit effort to improve the career and college readiness of students whose life circumstances have denied them the high school diploma and its associated academic and behavioral skills – which countless studies have shown to be essential for navigating American daily life (Cameron & Heckman, 1993; Heckman & Rubinstein, 2001; Murnane & Tyler, 2001; Murnane et al., 2000; Patterson et al., 2010; Rachal & Bingham, 2004; Roderick et al., 2009; Trebino, 2008;

Tyler, 2003; Tyler and Lofstrom, 2010; Upchurch, 1976; Zhang et al., 2011). To grasp the magnitude of the shift, consider the following: in 2013, there were 120,419 sixteen-to-eighteen year-olds who passed the exam. In 2014, only 23,870 passed – an 80% drop. The contrast is highlighted in Figure 1. And further, the new exam is calibrated on the performance of a national sample of around 6,500 high school seniors about to graduate in 2013. For even more alignment to the GED population, the sample was limited to students graduating with less than a 3.0 average. In that 2013 sample, a full 70% of these students passed the exam (GED Testing Service, 2014). The disparity between the 2013 high school seniors pass rate and the drop in number of GED 2014 test passers illustrates the divide in work and college readiness when we consider the level of preparation for passing GED prior to 2014 and the current level of cognitive, academic and behavioral skills of high school graduates. In a preliminary planning document, the GED Testing service asserted that the new exam “...will dramatically increase the number of test-takers who are prepared to pursue post-secondary education opportunities....” (American Council on Education, ND, p. 1).

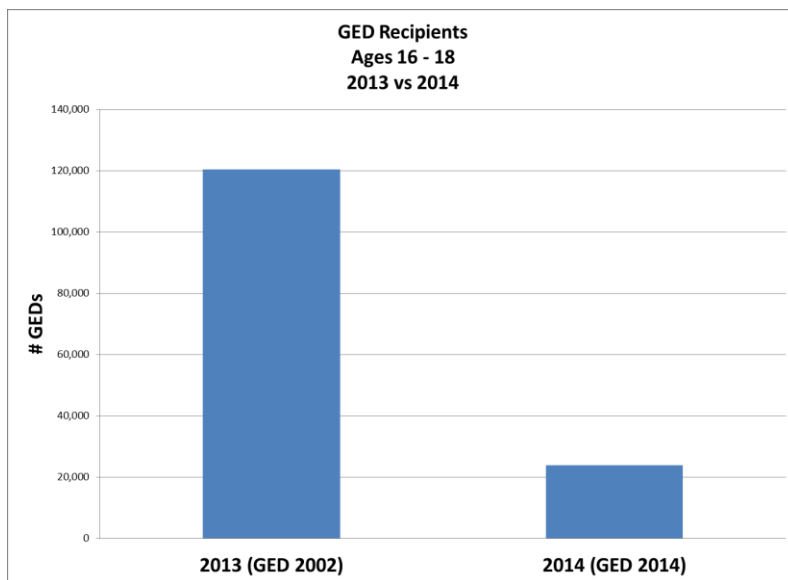


Figure1. GED attainment 2013 vs 2014.

Note: This information came from personal communication with GED Testing Service.

## Academic Perseverance, Performance and GED 2014

Critics of the GED as a high school equivalency have asserted that the GED is a certificate of not having the high school skills like persistence in spite of demonstrating high school level academic skills (Heckman & Rubinstein, 2001). This argument, although recognizing the importance of non-academic skills, ignores the link between increased academic performance and behavioral change. Farrington (2013) described academic perseverance and performance as closely linked and developed across elementary and secondary schooling, which allows students to not only successfully complete academic schooling but “to productively engage in work and civic life” (p. 2). Duckworth et al. (2007) emphasized the importance of developing a student’s long term persistence for achieving academic goals and introduced the term *grit* as a “trait-level perseverance and passion for long term goals” (p. 1087).

According to Farrington (2013), “students with positive academic mindsets work harder, engage in more productive academic behaviors, and persevere to overcome obstacles to success. Conversely, students with negative mindsets about school or about themselves as learners are likely to withdraw from the behaviors essential for academic success and to give up easily when they encounter setbacks or difficulty” (p. 4). Thiessen (2008), used the term educational resilience to describe the behavior students who succeed in spite of poor academic performance. He cautioned that while intuitively appealing, educational resilience is an ill-defined, but multifaceted construct. While vague, it is a necessary individual *trait* because its level defines an individual’s effort to overcome barriers. Thiessen stated that students with low academic resilience viewed most academic tasks as more difficult and therefore “*gave up* more easily (made less effort) and this reduced their subsequent achievement” (p. 32). Farrington et al. assert that the behavior associated with educational success can be acquired in high school, and

propose a descriptive feedback-loop model with obvious applicability to current GED programs: instructors and classroom control context which affects the students' academic mindset; the mindset affects perseverance which affects behavior which affects performance which loops to further improve students' academic mindset (2012). This model will be referenced in the discussion section.

Theoretically, the increased rigor of the new GED should translate into greater employment success (i.e., economic benefits) for those students who successfully completed it because GED 2014 completers' greater academic performance implies greater academic perseverance than dropouts. Therefore, the next section reviews the economic benefits of the GED 2014.

### **Economic Benefits of GED 2014**

Studying the economic benefits of the GED is important because Stuit and Springer (2010) stated that the economic and social consequences of being a high school dropout are profound. Researchers (Belfield & Levin, 2007; Hout, 2012; Levin, Belfield, Muennig, & Rouse, 2007; Rouse, 2007) established that high school dropouts experience poorer employment rates, earn less, and tend more to criminality, public dependency, and poor health than high school graduates. Agreeing, D'Andrea (2010) indicated that "educational attainment is a key predictor of a person's level of success in life. Evidence shows that individuals with greater levels of education have higher-paying jobs, better general health, and a lower likelihood of being incarcerated" (p. 7). Levin et al.'s (2007) research found "male high school graduates earn \$117,000–\$322,000 more than dropouts; those with some college earn significantly more; and the difference in lifetime earnings between a high school dropout and a college graduate is \$950,000–\$1,387,000. Similarly, female high school graduates earn \$120,000–\$244,000 more

than dropouts. Female college graduates also do well, earning roughly \$800,000 more than high school dropouts” (p. 7).

Furthermore, dropouts have a higher societal cost (i.e., cash aid, food benefits, housing aid, Medicaid, and/or incarceration costs) for the federal government and for states. Levin et al. (2007) found “significant differences in coverage across education levels: [high school] graduates enroll at half the rate of dropouts; and those with college degrees enroll at very low rates” (p. 11). Belfield and Levin (2007) conservatively reckoned that transforming a dropout into a high school graduate would provide, over the graduate’s lifetime, a net average savings to the federal government of \$115,000 and \$54,000 to local and state governments. Levin et al. (2007) wrote that almost half of all Temporary Assistance for Needy Families (TANF; e.g., food stamps; and housing assistance) recipients are high school dropouts. Correspondingly, Levin et al. noted that “of the 1.6 million persons annually receiving housing assistance, a disproportionate number are high school dropouts. Finally, the most extensive program is food stamps, in which 9.6 million non-elderly adults participated in 2004. Again, education is important, with receipt rates for dropouts almost double those for high school graduates” (p. 11).

While there is an accumulation of research surrounding the economics of dropping out, less research abounds regarding the economic success of students completing the GED. Heckman and colleagues are one of the few researchers to look at the academic success of GED completers. Heckman and LaFontaine (2010) found that while “GED recipients have the same measured academic ability as high school graduates who do not attend college, on average, they have the economic and social outcomes of otherwise similar dropouts who do not exam certify [dropped out]” (p. 3). Finally, Heckman, Humphries, LaFontaine, and Nader (2009) painted a slightly better picture. They found a difference in wages (both total and hourly) and hours

worked for GED completers and high school graduates versus high school dropouts. Specifically, GED average wages were slightly higher than dropouts, but lower than high school graduates.

## **Purpose**

Based upon the literature review, the purpose of this paper is to anticipate the economic outcomes of students who must now pass the GED 2014. By examining and comparing the outcomes before 2014 of high school dropouts (Dropouts), GEDs and high-school graduates (Graduates), we will show concrete differences in post-secondary readiness and identify where GED 2014 needs to mitigate the influence of not completing the traditional high school program. Our current paper is based on the data released 14 months after a previous GED study (Bouchard, 2013) and compares incomes of GEDs, Dropouts and Graduates eight years after graduation based on their post-secondary educational training. A follow-up paper will describe differences between and within the groups based on socio economic-status (SES), 10<sup>th</sup> grade math and reading test scores, math classes taken in high school, and post-secondary educational achievement and more explicitly describe how GED 2014 will mitigate the effects of not completing high school. Central to both papers is the argument that those who pass GED 2014 will have more of the skills necessary to earn a family wage than those who passed the exam prior to 2014.

The Bouchard (2013) study used the Educational Longitudinal Survey of 2002 (ELS 2002), a National Center for Educational Statistics (NCES) longitudinal survey of more than 16,000 tenth graders in 2002, to examine the 2006 post-secondary educational attendance of high school graduates and GEDs, two years after graduation. ELS 2002 data provide increased precision over previous data regarding the post-secondary outcomes for younger GEDs because they include GEDs earned with the GED Option program which allows 16 and 17 year olds to



take the test and allows older GED candidates under the age of 21 to remain in high school while preparing for the exam. And, because the GED Exam was revised in 1978, 1988 and 2002 to reflect increasing performance expectations (American Council on Education, 2010), the ELS 2002 data present the most recent cohort data that is available. The landmark studies (Cameron and Heckman, 1993; Murnane et al, 2000) used data from the 1979 – 1987 National Longitudinal Study of Youth (NLSY) and from the 1980 – 1992 High School and Beyond (HSB), National center for Educational Statistics (NCES) surveys that were in place before the GED Option program was begun in 1988 and are restricted to 18 year olds and older who were out of school. The 2013 Bouchard study looked at attendance because the actual post-secondary outcomes were not available. The observations were largely unsurprising: GEDs' attendance was inferior to that of high school graduates; SES played a role; and those with higher 10<sup>th</sup> grade math and reading test scores on a NAEP and PISA composite exam showed better attendance. This is the background to the current study.

However, in early 2014, eight years after graduation when the respondents were 26 years old, the third follow-up data to ELS 2002 were released that included post-secondary educational outcomes and annual income (and employment) for 2011. In other words, even without resorting to complex analyses, data from ELS 2002 not only provide a view of GED income relative to Graduates and Dropouts, but refined the analysis by means of four understandable groupings: (a) no post-secondary training, (b) unsuccessfully attempted post-secondary training, (c) succeeded with an Associate's degree or certificate, and (d) achieved a Bachelor's degree or better. Clearly a simple comparison of incomes based on Dropout, GED, and Graduate status is insufficient because it fails to account for the influence of post-secondary training on income – a GED with a BA should have greater income than a GED with no training. Work readiness is based on

income, which is how the market place values secondary and post-secondary education. Differences and similarities are readily apparent and consistent across all groupings starkly reminding the casual observer of the value of secondary and post-secondary education—especially for low the low SES students who are most frequently dropouts or GEDs, a phenomenon that will be described in the follow-up paper. And, because GED recipients also lie between Graduates and Dropouts in terms of math and reading test scores and high school math classes (Bouchard, 2013), it is no leap of faith to believe increasing GED test rigor will improve post-secondary outcomes for GED recipients.

## **Method**

### **Data and Sample**

This study sample, ELS 2002, is part of a series conducted by the National Center for Educational Statistics (NCES) and contains a sample of 16,197 students surveyed as 10<sup>th</sup> graders in the spring of 2002. It was gathered from 1,200 public, Catholic, and other private schools of which around 750 participated. Of the 17,600 eligible 10<sup>th</sup> graders, more than 15,000 completed the questionnaire. There were seven elements to the survey: (a) math and reading assessments specific to ELS 2002; (b) student survey; (c) parent, teacher, administrator and librarian surveys; (d) first follow-up, a 2004 survey of students in their graduation year determining their graduation status (graduate, dropout or GED); (e) 2004-2005 transcript study in which the related high school transcripts were compiled—these data are restricted to license holders, (f) second follow-up in 2006; and (g) third follow-up in 2012 which attempted to contact all original students. Variables measured included race/ethnicity, parent education, income, occupation, classes taken in high school, post-secondary educational outcomes, and 2011 income. Nearly all the 10<sup>th</sup> graders completed cognitive assessments in math and reading tied to NAEP and PISA

prior to the survey. The first follow-up was in spring 2004 when the participants were seniors, and the second follow-up was conducted in 2006, two years after the expected graduation date. ELS 2002 included transcripts as a restricted data-file, gathered in spring of 2005 detailing the courses taken during the high school careers of GEDs, graduates, and dropouts; some of these data were recoded for inclusion in the ELS 2002 public data files. The third follow-up includes post-secondary educational outcomes as well as annual income for the calendar year 2011 – seven years after high school graduation. The ELS 2002, thus, represents a continuing series of data representing the most current educational trends in high school.

### **Current Study**

This study follows three groups within ELS 2002—2004: (a) high school graduates, (b) the GEDs who dropped out and received the certificate by 2006, and (c) drop-outs who had received no certificate by 2006. More simply, our study examines the economic outcomes as defined by income of 25 year-olds based on their high school graduation status and post-secondary training. Table 1 shows the overall distribution of income percentiles for dropouts, GEDs and high school graduates and begs the question of how the incomes break down based on post-secondary training. The expectation is that increased training leads to higher income and that at some point in the training the distinction between Dropout, GED and Graduate blurs. This expectation is validated in the subsequent tables that show between-group and within-group income distribution for those with no post-secondary training, failed post-secondary, AA or certificate, and bachelor's degree or better.

## Results

### Income by Secondary Education Status

High school (HS) graduates made more money than GEDs who made more than Dropouts. Within the lowest income quartile there were 26% of HS Graduates, 40% of GEDs and 47% of Dropouts. Within the highest income quartile there were 26% of HS Graduates, 13% of GEDs and 10% of Dropouts. Both GEDs and Dropouts income trended down from the first to fourth income quartiles. HS Graduates' income remained nearly constant. Missing cases could be an issue for Dropouts: 32% of Dropouts were missing income information compared to 16% of Graduates and 17% of GEDS. However, it is unlikely that the missing cases relate to higher income. Current GED students in our program plausibly assert that the non-response is the result of embarrassment or shame over low post-secondary achievement and income. The relative income and employment, therefore, for Dropouts is actually lower than the responses indicate!

Within each cluster of income, there is an obvious trend. There is a higher percentage of dropouts and GEDs in the unemployed and less than \$20,000 per year while high school graduates are the increasingly dominant group in the income groups above \$20,000. Of particular note is the distribution in the \$0 category, those who had no income for the year. This included 22% of the dropouts, 17% of the GEDs and only 11% of high school graduates. These students were not work ready. Of students earning more than \$30,000 / year, the living wage, the group included 36% of HS graduates, 19% of GEDs and 16% of dropouts. The market place appears to have determined work readiness.

All the income distributions in our study show skewness that prevents the use parametric statistics for group comparisons. Consequently, all the comparisons to determine differences used the non-parametric Kruskal-Wallis Test. Post-hoc analyses were done with the non-

parametric Mann-Whitney Test in which comparisons are between mean ranks. Therefore, median will be used as a summary statistic.

In Table 1, the percentage of the sample in each income categories for dropouts, GED, and graduates is listed. This table shows that the median income for dropouts was \$12,000, for GED was \$15,000, and for graduates was \$24,000. Moreover, the Kruskal-Wallis statistics, listed in Table 2, show it was unlikely that this income distribution was random because the Chi Square was significant,  $p < .00$ .

Table 1

*Summary Descriptive Income Statistics for Graduates, GEDs and Dropouts*

Income Interval	Dropouts	GED	Graduates	All
0 Income (unemployed)	22%	17%	11%	12%
10k\$	25%	24%	15%	16%
20k\$	22%	22%	19%	19%
30k\$	16%	18%	20%	19%
40k\$	8%	11%	15%	15%
50k\$	3%	4%	9%	9%
60k\$	2%	2%	5%	5%
70k\$	1%	1%	3%	3%
80k\$	1%	0%	2%	2%
80k\$+	1%	1%	2%	2%
Valid Response	958	492	11,800	13,250
Legit skip	92	20	347	459
Nonresponse	451	100	1937	2,488
Total	1,501	612	14,084	16,197
Mean	\$15,979	\$19,020	\$27,115	\$26,009
Median	\$12,000	\$15,000	\$24,000	\$23,000
Std. Deviation	\$18,181	\$20,709	\$24,296	\$23,993
Skewness	3.30	3.87	2.77	2.80
St. Error of Skewness	.08	.11	.02	.02

*Kruskal-Wallis Test of income between HS Graduates, GEDs, and Dropouts*

		N	Mean Rank
2011 Income	HS Graduate	11,800	6,838
	GED	492	5,296
	Dropout	958	4,692
	Total	13,250	
Chi Square	341.26		
df	2		
Sig	.00		

The post-hoc Mann-Whitney tests, in Table 2, compared the incomes and showed significant income rank differences between all categories. The difference between HS Graduates and Dropouts was significant,  $p < .00$ , with a small to medium effect size,  $r = .15$ . The difference between GEDs and HS Graduates was significant,  $p < .00$ , with a small effect size,  $r = .08$ . Finally, the differences between GEDs and Dropouts was also significant,  $p < .00$ , with a small effect size,  $r = .09$ .

Table 2

*Mann-Whitney Test of income between HS Graduates, GEDs, and Dropouts*

		N	Mean Rank	U	z	p	r
2011 Income	HS Graduate	11,800	6,204				
	GED	492	4,767				
	Total	12,292		2,224,088	8.80	.00	.08
	HS Graduate	11,800	6,534				
	Dropout	958	4,472				
	Total	12,758		3,824,577	16.69	.00	.15
	GED	492	775				
	Dropout	958	699				
	Total	1,450		211,123	3.26	.00	.09

## Income by Post-Secondary Educational Status – Between Groups

The groupings, Dropouts, GEDs, and Graduates include varying amounts of post-secondary training. The next section compares their incomes based on their post-secondary training.

**No post-secondary education.** The clearest income comparison between GEDs, Dropouts and Graduates examines those with no further training beyond high school. As shown in Table 3, median income for GEDs lies between that of Dropouts and Graduates. Median income is closer to Dropouts than Graduates. These statistics in Table 3 show it was unlikely that this income distribution was random because the Chi Square ( $p < .00$ ) was significant.

Table 3

*Summary Descriptive Income Statistics for Graduates, GEDs and Dropouts with no post-secondary education*

	Dropouts	GED	Graduates
0 Income	24%	19%	18%
20k\$	46%	45%	36%
40k\$	25%	30%	34%
60k\$	4%	5%	8%
60k\$+	2%	1 %	5%
Valid Response	553	130	1061
Mean	\$15,451	\$16,614	\$21,967
Median	\$11,000	\$15,000	\$19,500
Std. Deviation	\$18,945	\$16,106	\$23,120
Skewness	4.33	1.29	3.43
St. Error of Skewness	.10	.21	.08

*Kruskal-Wallis Test of income between HS Graduates, GEDs, and Dropouts*

		N	Mean Rank
2011 Income	HS Graduate	1,061	933
	GED	130	825
	Dropout	553	767
	Total	1,744	
Chi Square	41.01		
df	2		
Sig	.00		

Post-hoc Mann-Whitney Tests, shown in Table 4, compared the incomes of the three groups. The income differences between HS Graduates and Dropouts was significant,  $p < .00$ , and with a small to medium effect size,  $r = .16$ . The differences between GEDs and HS Graduates was also significant,  $p < .02$ , with a small effect size,  $r = .08$ . However, the difference between the income between GED and Dropout was non-significant,  $p = .19$ .

Table 4

*Mann-Whitney Test of income between HS Graduates, GEDs, and Dropouts with no post-secondary training*

		N	Mean Rank	U	z	p	r
2011 Income	HS Graduate	1,061	604				
	GED	130	529				
	Total	1,191		60,215	2.37	.02	.07
	HS Graduate	1,061	860				
	Dropout	553	707				
	Total	1,614		237,792	6.28	.00	.16
	GED	130	362				
	Dropout	553	337				
	Total	683		33,303	1.31	.19	.05



**Income for unsuccessful post-secondary education.** This grouping is the most interesting in terms of the central argument that GEDs, Dropouts, and graduates possess differing amounts of secondary training and income and that GED 2014 will increase post-secondary income. These GEDs sought post-secondary training believing the assertion that GED 2002 was the equivalent of the high school diploma and, thus, was sufficient preparation for post-secondary training. The income difference between them and Dropouts and Graduates reflects the difference in skills. The failure to complete post-secondary training is a function of whatever was lacking in their secondary training. And, although both failed post-secondary education, the graduates, by definition, have more skills. This issue will be further addressed by the within groups income comparison of those with no post-secondary skills and those who failed at post-secondary.

As shown in Table 5, for students who attempted post-secondary education the median income for GEDs lies between that of Dropouts and Graduates. Statistics in Table 5 also showed it was unlikely that this income distribution was random because the Chi Square was significant,  $p < .00$

Table 5

*Summary Descriptive Income Statistics for Graduates, GEDs and Dropouts who attempted post-secondary education*

Income Interval	Dropouts	GED	Graduates
0 Income	22%	18%	14%
20k\$	50%	49%	40%
40k\$	23%	25%	34%
60k\$	5%	5%	9%
60k\$+	1%	3%	4%
Valid Response	254	239	3,599
Mean	\$14,216	\$18,084	\$21,999

Median	\$12,000	\$15,000	\$20,000
Std. Deviation	\$14,215	\$18,580	\$21,129
Skewness	1.23	2.06	3.20
St. Error of Skewness	.15	.16	.04

*Kruskal-Wallis Test of income between HS Graduates, GEDs, and Dropouts*

		N	Mean Rank
2011 Income	HS Graduate	3,599	2,094
	GED	239	1,818
	Dropout	254	1,587
	Total	4,092	
Chi Square	53.23		
df	2		
Sig	.00		

Post-hoc Mann-Whitney Tests shown in Table 6 compared the incomes of the three groups who attempted post-secondary education. The income differences between HS Graduates and Dropouts was significant,  $p < .00$ , with a small effect size,  $r = .11$ . The differences between GEDs and HS Graduates was significant,  $p = .00$ , with a small effect size,  $r = .06$ . Lastly, the test was showed a statistically significant difference in income between GED and Dropout,  $p < .03$ , with a small effect size,  $r = .06$ .

Table 6

*Mann-Whitney Test of income between HS Graduates, GEDs, and Dropouts who attempted post-secondary training*

		N	Mean Rank	U	z	p	r
2011 Income	HS Graduate	3,599	1,935				
	GED	239	1,677				
	Total	3,838		372,194	3.50	.00	.06
	HS Graduate	3,599	1958				
	Dropout	254	1481				
	Total	3853		343,950	6.61	.00	.11
	GED	239	262				
	Dropout	254	233				
	Total	493		26,868	2.21	.03	.06

**Income for AA or certificate.** As shown in Table 7, median income for GEDs lies between that of Dropouts and Graduates and is closer Graduates than to Dropouts who earned a certificate or an associate of arts (AA) degree. It was unlikely that this income distribution was random because the Chi Square was significant,  $p = .00$ .

Table 7

*Summary Descriptive Income Statistics for Graduates, GEDs and Dropouts who earned a certificate or AA*

Income Interval	Dropouts	GED	Graduates
0 Income	19%	12%	9%
20k\$	49%	43%	39%
40k\$	26%	33%	36%
60k\$	4%	8%	11%
60k\$+	3%	2%	2%
Valid Response	108	96	2,110
Mean	\$17,071	\$21,857	\$24,478
Median	\$14,500	\$20,000	\$22,000
Std. Deviation	\$17,369	\$18,936	\$21,413
Skewness	1.72	1.30	2.91
St. Error of Skewness	.23	.25	.05

*Kruskal-Wallis Test of income between HS Graduates, GEDs, and Dropouts*

		N	Mean Rank
2011 Income	HS Graduate	2,110	1,175
	GED	96	1,083
	Dropout	108	887
	Total	2,314	
Chi Square	20.28		
Df	2		
Sig	.00		

Post-hoc Mann-Whitney tests, in Table 8, indicated non-significant difference between GED and Graduate,  $p = .19$ . There were significant differences between graduate and dropout,  $p < .00$ , with a small effect size,  $r = .09$ . The difference between GED and Dropout were also significant,  $p = .03$ , with a small effect size,  $r = .06$ .

Table 8

*Mann-Whitney Test of income between HS Graduates, GEDs, and Dropouts who earned an AA or certificate*

		N	Mean Rank	U	z	p	r
2011 Income	HS Graduate	2,110	1,107				
	GED	96	1,019				
	Total	2,206		92,205	1.32	.19	.03
	HS Graduate	2,110	1123				
	Dropout	108	848				
	Total	2,218		85,666	4.36	.00	.09
	GED	96	112				
	Dropout	108	94				
	Total	493		4,292	2.12	.03	.06

**Income for bachelor's or above.** As noted in Table 9, average incomes for Dropouts, GEDs and Graduates hovered around \$30,000. However, although the median incomes for Dropouts and Graduates were both \$30,000, median income for GEDs was \$22,000. It was not unlikely that this income distribution was random because the Chi Square was not significant,  $p = .062$ .

Table 9

*Summary Descriptive Income Statistics for Graduates, GEDs and Dropouts who earned a BA, BS or above*

Income Interval	Dropouts	GED	Graduates
0 Income	12%	11%	7%
20k\$	30%	36%	27%
40k\$	25%	45%	35%
60k\$	24%	4%	20%
60k\$+	9%	4%	11%
Valid Response	43	27	5,030
Mean	\$30,442	\$28,796	\$32,967
Median	\$30,000	\$22,000	\$30,000
Std. Deviation	\$22,804	\$46,641	\$26,441
Skewness	.463	4.37	2.52
St. Error of Skewness	.36	.45	.04

*Kruskal-Wallis Test of income between HS Graduates, GEDs, and Dropouts*

		N	Mean Rank
2011 Income	HS Graduate	5,030	2,555
	GED	27	1,896
	Dropout	43	2,455
	Total	5,100	
Chi Square	5.56		
df	2		
Sig	.06		

### **Income by Post-Secondary Educational Status – Within Groups**

The within group income comparison for educational levels of Dropouts, GEDs and Graduates examines the relation between the levels of post-secondary training and income for each group. A common assumption, particularly within the educational community, is that any

post-secondary training increases employability and income. The following comparisons imply that this is not the case for Dropouts and GEDs.

**Dropout incomes by post-secondary status.** This shows an unambiguous relationship. Dropouts have low skills; some, but not all, post-secondary training adds skills that are rewarded in the marketplace. Table 15 shows the income distributions, average and median incomes between the five post-secondary training levels. They present an upward trend from no training to BA, BS+. Table 10 displays the statistically significant Chi Square differences,  $p < .00$ .

Table 10

*Summary Descriptive Income Statistics for Dropouts Based on post-secondary Education*

Income Interval	NO PS	Attempted PS	AA or cert	BA, BS +
0 Income	24%	18%	19%	12%
20k\$	21%	50%	49%	30%
40k\$	9%	23%	26%	25%
60k\$	1%	5%	4%	24%
60k\$+	1%	1%	3 %	9%
Valid Response	553	254	108	43
Mean	\$15,451	\$14,216	\$17,071	\$30,432
Median	\$11,000	\$12,000	\$14,500	\$30,000
Std. Deviation	\$18,945	\$14,215	\$17,369	\$22,804
Skewness	4.33	1.23	1.72	0.46
St. Error of Skewness	.104	0.15	0.23	0.36

*Kruskal-Wallis Test of Income for Dropouts Based on post-secondary Education*

		N	Mean Rank
2011 Income	No Post-secondary	553	468
	Failed PS	254	462
	AA or Certificate	108	504
	BA, BS+	43	666
	Total	958	
Chi Square	22.45		
df	3		
Sig	.00		

Post hoc Mann-Whitney Tests shown in Table 11 compared the incomes of the five post-secondary training levels of Dropouts. The income differences between No Post-secondary and BA, BS+ was significant,  $p < .00$ , and had a small to medium effect size,  $r = .18$ . The differences between No Post-secondary and Failed PS was not significant,  $p = .80$ . The differences between No Post-secondary and AA or Certificate was not significant,  $p = .22$ . The income differences between Failed PS and AA or Certificate was also not significant,  $p = .17$ . The income differences between Failed PS and BA, BS+ was significant,  $p < .00$ , and had a medium effect size,  $r = .26$ . Finally, the income differences between AA or Certificate and BA, BS+ was significant,  $p = .00$ , with a medium effect size,  $r = .28$ . For Dropouts, only completing training at the Bachelors level significantly affects income in a positive manner.



Table 11

*Mann-Whitney Test of Dropout's Income Based on Post-secondary Training*

		N	Mean Rank	U	z	p	r
2011 Income	No Post-secondary	553	289				
	BA, BS+	43	411				
	Total	596		7,055	4.47	.00	.18
	No Post-secondary	553	405				
	Failed PS	254	401				
	Total	807		69,461	.25	.80	.01
	No Post-secondary	553	327				
	AA or Certificate	108	351				
	Total	661		27,657	1.22	.22	.05
	Failed PS	254	177				
	AA or Certificate	108	193				
	Total	362		12,473	1.37	.17	.07
	Failed PS	254	112				
	BA, BS+	43	94				
	Total	297		3,126	4.50	.00	.26
	AA or Certificate	108	68				
	BA, BS+	43	95				
	Total	151		1,487	3.45	.00	.28

**GED incomes by post-secondary status.** The within group income comparison for educational levels of GEDs presents a more ambiguous picture. Although, as noted in Table 12, the average and median incomes appear to increase with training, especially for those earning the BA, BS or above, the Kruskal Wallis Test unable to disprove the null hypothesis that there was no statistical difference between the post-secondary educational groups.

Table 12

*Summary Descriptive Income Statistics for GEDs Based on post-secondary Education*

Income Interval	NO PS	Attempted PS	AA or cert	BA, BS +
0 Income	19%	18%	12%	11%
20k\$	45%	49%	43%	36%
40k\$	30%	25%	33%	45%
60k\$	5%	5%	8%	4%
60k\$+	0.8%	3%	4 %	4%
Valid Response	130	239	96	27
Mean	\$16,614	\$18,084	\$21,857	\$28,796
Median	\$15,000	\$15,000	\$20,000	\$22,000
Std. Deviation	\$16,106	\$18,580	\$18,936	\$46,641
Skewness	1.29	2.06	1.30	4.37
St. Error of Skewness	0.10	0.16	0.23	0.45

*Kruskal-Wallis Test of Income for GEDs Based on post-secondary Education*

		N	Mean Rank
2011 Income	No Post-secondary	130	232
	Failed PS	239	239
	AA or Certificate	93	273
	BA, BS+	27	281
	Total	492	
Chi Square	7.05		
df	3		
Sig	.07		

**HS graduate incomes by post-secondary status.** Table 13 presents the within group comparisons of incomes for Graduates. It clearly shows income benefits of post-secondary educational training. Median incomes rise from \$19,500 for those with no training to \$30,000 to

those with a BA, BS or above. The Kruskal-Wallis Test shows that the Chi Square differences are statistically significant,  $p = .00$ .

Table 13

*Summary Descriptive Income Statistics for Graduates Based on post-secondary Education*

Income Interval	No PS	Attempted PS	AA or cert	BA, BS +
0 Income	18%	14%	9%	7%
20k\$	36%	40%	39%	27%
40k\$	34%	34%	36%	35%
60k\$	8%	9%	11%	20%
60k\$+	5%	4%	4 %	11%
Valid Response	1061	3,599	2,110	5,030
Mean	\$21,967	\$21,199	\$24,478	\$32,967
Median	\$19,500	\$20,000	\$22,000	\$30,000
Std. Deviation	\$23,120	\$21,129	\$21,413	\$26,441
Skewness	3.43	3.20	2.91	2.51
St. Error of Skewness	0.08	0.04	0.05	0.04

*Kruskal-Wallis Test of Income for Graduates Based on post-secondary Education*

		N	Mean Rank
2011 Income	No Post-secondary	1,061	4,987
	Failed PS	3,599	5,091
	AA or Certificate	2,110	5,564
	BA, BS+	5,030	6,813
	Total	11,800	
Chi Square	662.40		
df	3		
Sig	.00		

Post hoc Mann-Whitney Tests shown in Table 14 compared the incomes of the five levels of Graduates. The income differences between No Post-secondary and BA, BS+ was significant,  $p < .00$ , with a small to medium effect size,  $r = .20$ . The differences between No Post-secondary and Failed PS was not significant,  $p = .22$ . The income differences between Failed PS and AA or Certificate was significant,  $p < .00$ , with a small effect size,  $r = .07$ . The income differences between AA or Certificate and BA, BS+ was significant,  $p < .00$ , with a small to medium effect size,  $r = .18$ .

Table 14

*Mann-Whitney Test of Graduates' Income Based on Post-secondary Training*

		N	Mean Rank	U	z	p	r
2011 Income	No Post-secondary	1,061	2,289				
	BA, BS+	5,030	3,206				
	Total	6,091		1,865,582	15.4	.00	.20
	No Post-secondary	1,061	2,286				
	Failed PS	3,599	2,344				
	Total	4,660		1,862,250	1.22	.22	.02
	No Post-secondary	1,061	1,474				
	AA or Certificate	2,110	1,642				
	Total	3,171		1,000,313	4.90	.00	.09
	Failed PS	3,599	2,765				
	AA or Certificate	2,110	3,009				
	Total	5,709		3,472,558	5.40	.00	.07
	Failed PS	3,599	3,582				
	BA, BS+	5,030	4,839				
	Total	8,629		6,415,724	23.12	.00	.25
	AA or Certificate	2,110	3,024				
	BA, BS+	5,030	3,779				
	Total	7,140		415,080	14.52	.00	.18

**Discussion**

Because most analyses of GEDs end by comparing them to Dropouts and Graduates, I attempt to identify similarities and differences that will lead GED instructors to implement practices that would improve GED outcomes. In other words, our goal is to identify factors that made GEDs less like Dropouts and more like High School Graduates and describe how the new

exam develops them. Similar to Heckman et al. (2007), our study showed that GED incomes seven years after high school graduation were between those of Dropouts and Graduates, although the differences decreased as the groups achieved similar post-secondary educational outcomes. Dropouts and GEDs had similar incomes that were lower than those of Graduates until the level of BA, BS, or above where the null hypothesis, that there was no income difference, was not disproven.

Table 15, an amalgamation of Tables 3,5,7,and 9 summarizes the similar income levels of Dropouts and GEDs. Visual inspection shows that the median yearly income of \$15,000 for GEDs with *no additional post-secondary* training was slightly higher than the median yearly income of \$11,000 for Dropouts with no additional post-secondary training. Both of those median salaries were much lower than the median yearly income of \$19,500 for high school HS Graduates with no additional post-secondary training. Furthermore, Table 15 shows that GED completers never attained the median income levels of HS Graduates no matter whether they attempted or obtained an AA degree, certification or a bachelor’s degree. However, both the between group  $p$  at the BA or BS level and the within group  $p$  for GEDs show values greater than 0.05. The post-hoc results are explained in the Results Interpretation.

Table 15

*Comparison of Median Incomes for GEDs, Dropouts and Graduates based on Levels of Post-Secondary Training*

	Dropout	GED	HS Graduate	Between Group $p$
No Post-secondary	\$11,000	\$15,000	\$19,500	0.00
Post-secondary Attempted	\$12,000	\$15,000	\$20,000	0.00
AA or Certification	\$14,500	\$20,000	\$22,000	0.00
BA or BS	\$30,000	\$22,000	\$30,000	0.06
Within Group $p$	0.00	0.07	0.00	

## **Limitations**

Before discussing the interpretations of the results, we want to cover some limitations of our research. First, the reader must exercise care in the interpretation of income differences and related effect sizes, recognizing that differences are for only one year that is only seven years after high school graduation. The studies mentioned earlier (Belfield & Levin, 2007; Hout, 2012; Levin, Belfield, Muennig, & Rouse, 2007; Rouse, 2007) describe lifetime earnings differences that are staggeringly greater. And, negative societal costs like TANF and Food Stamps did not figure in this analysis of the ELS 2002 data.

The other caveat of this research concerns the self-reported survey data used in this research. First, because our survey data was extant, we could not control the sampling, measurement, and overall survey design. The worth of interpretation of the survey data hinges on whether or not the survey respondents provided true and accurate answers – of which we cannot validate (Starr, 2012). It is commonly known that survey respondents show a tendency to want to be seen positively and, thus, provide desirable responses instead of truthful answers. Also, we cannot testify that all GED participants were surveyed, which would be considered an *error of nonobservation* (Groves, 1989).

## **Results Interpretation**

There are five main points we can draw from our current research tempered by the experience of personally coaching more than 500 high school students to GED attainment – including more than 50 to GED 2014. Importantly, the main theme that runs throughout our findings connects academic perseverance and performance to post-secondary success. Together, they may provide an explanation as to why students in the GED group did better or worse than students in the other groups (dropouts and high school graduates) as evidenced in Table 15.

First, the overall income comparison between the GED, Dropout and Graduate breathtakingly supports increasing the rigor of the exam. Of the 359 GEDs in the study who passed the GED 2002 exam and attempted post-secondary, 239 (66%) failed. While school officials implicitly alleged the 359 to be the equivalent of Graduates, the 66% failure rate showed those GED 2002 students were ill-prepared for the post-secondary training that would have increased their income. In comparison, only 34% of the Graduates failed. The increased rigor of GED 2014 can only reduce the number of failures to the rate of Graduates because it demands improved academic performance that theoretically will increase academic perseverance; thus, potentially increasing the future incomes of GEDs.

Second, for those with no post-secondary training GED income was not significantly different from that of Dropout. Graduate incomes, as expected, differed from both. A possible explanation is that these GEDs used the exam to leave high school early without the stigma of dropping out. These are the youth described by Rachel (2004) as having taken the option of “High School Lite” (p 38). Heckman and Rubinstein (2003) referred to this group as the “*wise-guys* who lack the abilities to think ahead, to persist in tasks, or to adapt to their environments” (p 117). In reference to the elevated standards set by *No Child Left Behind*, Heckman and Lafontaine further noted that “as educational standards are raised, students appear to use the more easily acquired GED credential” (2009) and argued that GED recipients should be counted as dropouts. Clearly, this is consistent with our income comparisons for those with no post-secondary training.

However, Duckworth (2007) observed that in terms of the Big Five model of personality, conscientiousness is closely related to job performance. Soto (2010) noted that adolescence is a time in human development when conscientiousness shows its steepest acquisition, although



Borgans et al. note that the greatest personality trait changes occur in early adulthood (2008). And, 8<sup>th</sup> grade dropouts who earned the GED after a struggle showed greater income gains from the GED than 11<sup>th</sup> and 12<sup>th</sup> grade dropouts who earned the credential (Trebino, 2008). Therefore, it follows that because the more difficult GED 2014 requires substantially more commitment from the wise-guy group, we can expect post-secondary improvements related to increase in grit – if the particular GED program relies on the interaction between academic mindset, context and performance described by Farrington et al (2012).

Third, among those who failed at post-secondary training, between group comparisons showed that GED income was between that of Dropout and a Graduate. This indicates that the GEDs possessed an intermediate skill set of academic perseverance and performance, even though all three groups considered themselves prepared for post-secondary training. However, while the exact reason for post-secondary failure was not known (e.g., economic versus effort), one could hypothesize that all lacked appropriate levels of academic perseverance that could have been improved by the academic mindset.

Fourth, income comparisons at the AA or certificate level failed to show income differences between Graduates and GEDs although both differed significantly from Dropouts who may have opted for lower value producing certificates rather than the AA. And, because there were no significant differences in income at the BA, BS+ level between *any* of the groups, one may conclude that if some members of the GED 2002 group possessed the skills to complete a bachelor's program, then greater numbers of those passing GED 2014 will follow suit.

Finally, the within-group ambiguity of GED post-secondary training incomes highlights the promise of the new exam. Unlike Graduates, where there were significant income differences between the post-secondary levels, GED income differences, although visible, were

not statistically significant – the range of incomes in each category is wider than those of Dropouts and Graduates suggesting influences other than the range of academic preparation. Although some GEDs possessed some of the academic skills required to complete post-secondary training, not all had the awareness of *what* post-secondary training would be rewarded by employers. In comparison, Graduates showed significant differences at every level while Dropouts only showed a difference at the bachelor's level, where because of their very low initial academic skills, they required extensive training at the hands of competent instructors. GEDs, however, like Dropouts below the bachelor's level, did not acquire the post-secondary navigation skills common to Graduates and bachelor's level Dropouts who learned them because of greater contact with adults who had successfully navigated the educational system in its entirety. The expectation is that those who pass GED 2014, compared to GED 2002 recipients, will have had more contact time with competent adults and therefore have developed more non-cognitive skills related to increased academic skills.

Not all GEDs are alike – there is a wide range of both academic skills deficiency and behavioral reasons for failing to graduate from high school; at least half of the group earning the GED 2002 did not have academic and behavioral skills comparable to those of Graduates. GEDs are generally missing some academic component coupled with a behavioral adaptation that provoked their giving up. Academic and behavioral skills are nested within each other and both can be improved by means of the student-teacher relationship characterized by expert instruction. GEDs must engage and succeed in a difficult task involving mastery at a basic level. This entails a behavioral change. GED 2014, because of the increased exam rigor, provides a mechanism for improving wages of at-risk youth and reducing the societal costs of inadequate academic training.

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