The Effect of the New Tech Network Design on Students' Academic Achievement and Workforce Skills

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The effect of the New Tech Network (NTN) design on students' academic achievement and workforce skills was tested in several schools in the southeastern United States. Results are provided for a sample of four treatment and four matched and equivalent control schools. Results suggest that the NTN treatment in schools implementing with fidelity significantly improved NTN students' academic achievement, as measured by composite ACT scores (English, Mathematics, Reading, and Science) and significantly improved students' critical thinking skills, mathematical reasoning skills, and workforce problem solving techniques, as measured by ACT WorkKeys Applied Mathematics scores. Results also suggest that the NTN treatment did not significantly improve students' abilities to read, understand, and use written text on the job, as measured by scores on the ACT WorkKeys Reading for Information assessment, and did not significantly improve students' abilities to locate, synthesize, and use information from workplace graphics, as measured by scores on the ACT WorkKeys Locating Information assessment.

Keywords: new tech design, project-based learning, problem-based learning, deeper learning skills, workforce skills

Workforce Skills

The New Tech Network focuses on systemic change and has implements deeper learning practices in many school settings that are geographically, politically, and socioeconomically diverse (Adams & Duncan Grand, 2019). The NTN design strives to enable students to gain the knowledge and skills they need to succeed in life, college, and the careers of tomorrow. In 2020, there are 85,000 students in 116 school districts learning in NTN schools across the United States. This represents 124 high schools, 43 middle schools, and 39 elementary schools. NTN schools integrate content across curriculum and focus on the development of student analytical and critical thinking skills, problem solving skills, and communication and collaboration skills. These schools utilize project-based learning as the primary pedagogical approach and teachers are supported by an online learning management system and program coaching. A one-to-one computer ratio seeks to create a learning network to connect students, teachers, and parents to each other and to the NTN national network. A standards-driven, STEM-infused curriculum provides students with rigorous and engaging STEM coursework.

A small number of past studies have investigated the efficacy of the NTN design, and numerous have analyzed outcomes of key components of the NTN design including project-based learning and school culture. A mixed-methods study conducted by the American Institutes for Research in 2014 analyzed the aggregate outcomes of ten schools implementing deeper learning practices, one of which was a NTN school. The study concluded that, compared to similar students in non-deeper learning schools, treatment students scored higher on all three reading, mathematics, and science PISA assessments; scored higher on the state English Language Arts (ELA) and mathematics tests; reported higher levels of interpersonal and intrapersonal competencies, such as collaboration, academic engagement, motivation to learn, and self-efficacy; and were more likely to graduate from high school on time, enroll in four-year postsecondary institutions, and enroll in selective institutions (Zeiser, Taylor, Rickles, Garet, & Segeritz, 2014). Additionally, and specific to NTN students, academic achievement and college and career ready outcomes were analyzed as a part of a federal Investment in Innovation project evaluation between 2015 and 2017. The study concluded, in its last year with the largest number of students included, that NTN 9th graders outperformed control students on end of course Math and ELA assessments and that, while there were null findings on some outcomes, NTN 11th graders outperformed control students on ACT composite scores and workforce skills outcomes measured by ACT WorkKeys (Culclasure, Odell, & Stocks, 2017). Furthermore, a study conducted by the Center of

Excellence in Leadership of Learning (2011) found that NTN students in Indiana had higher attendance rates and fewer disciplinary incidences than similar non-NTN students. Lastly, Rockman et al (2006) found that 89% of responding NTN alumni attended a two-year or four-year college/university, professional or technical instate and 40% of those alumni were majoring in STEM fields or working in STEM professions.

Several other studies conducted internally at NTN have yielded positive findings on these outcomes for students in NTN schools. A recent study found that students NTN students in Title I schools had higher graduation and enrollment rates than the national average (Bergeron, 2017). Another internal study done in rural North Carolina found high schools that utilized the NTN model had 100% graduation rates, compared to significantly lower district averages and comparison high school averages (Dobyns, Walsh, Lee, & Cuilla, 2012). In addition, NTN students had both higher attendance rates and composite SAT scores than similar students in district and comparison high schools. Several of the impact reports compiled by NTN also document the positive impact of attendance at a NTN school for students, particularly on retention and graduation rates.

Findings of a 2013 study suggested that project-based learning created an instructional environment that positively impacted student learning, relationships, and technology use and appeared to improve student self-efficacy. (Lynch, Spillane, Peters Burton, Behrend, Ross, House, & Han, 2013). Other studies point to the benefits of project-based learning on students with disabilities (National Center for Learning Disabilities, 2017). Several studies analyzing school culture also pointed to its benefit and impact on students (Ravitz, 2010; Reed & Lee, 2014).

Method

Treatment

The treatment described in this paper was the conversion of four schools with large populations of disadvantaged students, in four different districts, into NTN high schools. Teachers at the four treatment school were trained in, and were responsible for delivering, the core elements of the intervention. The selection of teachers occurred at the district and school level by district and/or school administration. Three treatment schools operated under a school-within-a-school model, whereas the fourth treatment school operated under a whole-school transformation model. Because the intervention and comparison groups are formed at the school level, contamination between conditions is not likely. Teachers in treatment schools do not have any contact with teachers or students in comparison schools and were, in fact, not aware of the existence of control schools.

Designs

This project used a quasi-experimental study design to examine the impact of the NTN design on academic and workforce skills of high school students, as measured by standardized achievement tests and workforce skills assessments. A total of eight high schools in eight different school districts in the southeastern United States were included in the study, comprising four project schools and four demographically similar non-NTN schools.

Data Source and Sample

Outcome data for this project was supplied directly to investigators by the Department of Education in the state in which the project was conducted. The data were downloaded from the state's PowerSchool data management system, which contained all outcome variables and covariates. The sample included four treatment and four matched control schools. The four treatment schools were chosen to be part of the project because of a nexus of two important factors: need and willingness to participate. Most importantly, the treatment schools showed academic and economic need, as defined by the state Department of Education, and that the administration at both the district and the school level were willing partners on the project. The following criteria were used to match treatment and comparison schools: grade structure (grades served on the school campus); enrollment; number of students eligible for free and reduced meals; racial/ethnic composition of student body; and a rating index used by the state Department of Education to compare similar schools. The rating index used by the state Department of Education involved 8th grade achievement scores, end-of-course test scores, on-time graduation rates, HSAP first attempt passing rates, and five-year total graduation rates. A dummy code for treatment schools versus control schools was created by the investigators (0 = control schools; 1 = treatment schools). Note that NTN staff were not involved in the collection, analysis, or reporting of this project.

Missing data were handled by casewise deletion. All cases missing outcome data, pre-test data, or any other covariate data were automatically excluded by SPSS from the analysis. There was no imputation of pre-test scores or outcome scores. Baseline equivalence was assessed for the analytic sample reported below.

Covariates

Investigators used three covariates in the project. The first was a *baseline achievement score* (AS) from when the participants were in 8th grade. This 8th grade AS was used because (a) all students in the state complete this assessment and (b) it provides a comprehensive assessment of student achievement across multiple domains. A composite AS was computed by averaging each student’s score on the Math and

English test subscores. The remaining two subscores (Science and Social Studies) were not employed in this project due to a large amount of missing data on those particular subtests (not all student take these assessments every year). The second covariate is *Poverty*. Eligibility for free/reduced meals (coded as 0 = No; 1 = Yes) was used as a proxy for poverty. The third covariate is *Race*. Students who were Asian or Caucasian were considered non-minorities (coded as 0). Students who were any other race, including mixed race, were considered minorities (coded as 1). We conducted parallel analyses to those reported below with gender as a covariate and found that it had no effect or interactions on the outcomes of the study. As such, we did not include this covariate in the analyses below. For the sake of completeness, investigators reported simple, unadjusted means and standard deviations of treatment and comparison group baseline measures of academic achievement (8th grade standardized AS), poverty status, minority status, and gender in Table 1.

Outcome Variables

The confirmatory contrasts were conducted on the ACT composite scores, ACT WorkKeys Applied Math scores, ACT WorkKeys Reading for Information scores, and ACT WorkKeys Locating Information scores. ACT is a college entrance exam based on what students are supposed to learn in high school. The benefits of using the ACT Test in this project is that (a) all students were required to complete it in 11th grade and (b) it is a standardized assessment that tests multiple domains of achievement. Specifically, the ACT Test has four subscales (math, English, writing, and science). Investigators chose to use the composite score for our primary contrast to assess academic achievement because this score reflects achievement across multiple domains. The ACT WorkKeys assessment evaluates foundational skills required for success in the workplace. ACT WorkKeys has three major subscales: Applied Mathematics, Reading for Information, and Locating Information. Given that these subscales measure different skills, investigators chose to treat each as a confirmatory, rather than exploratory, contrast.

Data Analysis Strategy

To model the overall impact of New Tech intervention on all outcomes noted above, we estimated a two-level hierarchical linear model, with students nested within schools. This model provided an estimate of the average impact of the intervention on students across all schools at a given time, as well as an estimate of the standard error of this impact. This multilevel modeling produces more accurate standard errors than a model ignoring the nested data structure (Raudenbush & Bryk, 2002).

The level 1, or student-level, equation is:

$$Y_{ij} = \beta_{0j} + \beta_{1j}(PASS\_gr8_{ij}) + \beta_{2j}(Poverty_{ij}) + \beta_{3j}(Minority_{ij}) + \varepsilon_{ij} \qquad (1)$$

where:

- Y_{ij} is an outcome measure (for example, ACT) of the *i*th student in the *j*th school.
- $PASS\_gr8_{ij}$ is a pre-program achievement measure – score on the 8th grade state test – for the *i*th student in the *j*th school.
- $Poverty_{ij}$ is a dummy variable taking the value 1 if the *i*th student in the *j*th school is eligible for free or reduced-price meals and 0 otherwise.
- $Minority_{ij}$ is a dummy variable taking the value 1 if the *i*th student in the *j*th school is a minority and 0 otherwise.
- β_{0j} is the intercept.

- $\beta_{1j} - \beta_{3j}$ are regression coefficients indicating the effect of each student-level covariate on the outcome measure Y_{ij}
- ε_{ij} is the student-level residual or error term of the *i*th student in the *j*th school (the assumed distribution of these residuals is normal, with mean 0 and variance ϕ^2.

The level 2, or school-level, equations are:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}*(TREATMENT_j) + u_{0j}$$

$$\beta_{1j} = \gamma_{10} \quad (2)$$

$$\beta_{2j} = \gamma_{20} \quad (3)$$

$$\beta_{3j} = \gamma_{30} \quad (4)$$

where:

- γ_{00} is the covariate-adjusted mean value of the outcome measure across control schools when the treatment indicator variable=0.
- γ_{01} is the mean difference in the covariate-adjusted outcome between treatment and control schools (main effect of treatment).
- *Treatment* is the treatment status dummy variable that takes the value 1 for an NTN treatment school and 0 for a comparison school.
- u_{0j} is the error term for the *j*th school (the distribution is assumed to be normal, with mean 0 and variance $\tau_0^{\ 2}$).
- $\gamma_{10} - \gamma_{30}$ are regression coefficients indicating the average effect of each student-level covariate on the outcome measure, Y_{ij}.

The parameter γ_{01} indicates the impact of the New Tech treatment on the specified student outcome. A t-test was conducted to test the null hypothesis that the average treatment effect is 0, using a .05-level criterion. A positive and statistically significant estimate of γ_{01} is interpreted as evidence that the NTN intervention has a positive impact on the student outcome.

Because we did not conduct multiple comparisons within a single domain, Benjamini-Hochberg correction is not necessary.

Note, however, that the cluster size in the present study is quite small (N = 4 per condition). Maas and Hox (2005) demonstrated, quite convincingly, that conducting HLM analyses with cluster size of less than 50 at the second level in a two-level model yields inaccurate results. Given our cluster size of four per condition, HLM will likely yield biased impact estimates. In such cases, it is generally advisable to focus on the single-level model rather than the multi-level model (Gelman & Hill, 2007; Maas & Hox, 2005; Raudenbush & Byrk, 2002). It is also important to note that when ICCs for the null model in HLM are zero or near zero, a single-level model is appropriate than a multi-level model. As will be discussed below, the ICCs for all outcome variables in this study are less than .07, which is further evidence that a single-level model is more appropriate for this data set (Raudenbush & Byrk, 2002). However, for the sake of completeness, we shall present both levels of analysis here. We suggest focusing on the single-level model rather than the multi-level model, but the reader can decide which analysis is more informative.

Results

Baseline Equivalence of the Sample

As depicted in Table 1, the control and treatment schools were quite similar. There was no significant difference on the 8th grade SA score (p = .11) between the two groups. Likewise, there was no significant difference in the proportion of students in poverty (p = .23), minority students (p = .11), or proportion of females (p = .65) in the control versus treatment samples. Thus, the control and treatment groups appear to be sufficiently equivalent to proceed with the analyses.

HLM Results

HLM analyses were conducted using Mixed Model Linear in SPSS Version 24. The models were analyzed using the Restricted Maximum Likelihood (REML) estimation method. Table 2 reports unadjusted sample sizes, means, and standard deviations for all outcomes in the study. Tables 3-6 report the results from confirmatory contrasts on key outcomes in the study.

ACT Composite Score Outcome

Statistical results for this variable are reported in Table 3. To assess the effect of the New Tech model on academic achievement, investigators analyzed participants' scores from the ACT Test (Composite score). An analysis of the unconditioned (null) model indicates that the interclass correlation coefficient (ICC) for the ACT Test Composite Score is .04, which suggests that the school in which a student is learning accounts for 4% of the variance in ACT Test score. As noted above, when ICCs are zero or near zero, it is more appropriate to focus on a single-level model rather than a multi-level model.

To calculate the single-level model, we conducted a mixed-model linear analysis with 8th grade AS, poverty, and race as covariates, NTN school (vs. non-NTN) as the predictor, and ACT Test Composite Score as the outcome variable. The results suggest that participants in the New Tech schools had significantly higher scores on the ACT Test than did participants in the control condition, $t(819) = 3.63$, $p < .001$.[1]

For the sake of completeness, we also report the results of a two-level HLM in Table 3 for this outcome variable. Consistent with the single-level model described previously, the results of the multi-level model also suggests that participants in the New Tech schools had significantly higher scores on this variable than did participants in the control condition, t (7.78) = 2.30, p = .05.

ACT WorkKeys Applied Mathematics Outcome

Statistical results for this variable are reported in Table 4. To assess the effect of the NTN model on math skills relevant to entering the workforce, investigators analyzed participants' scores from the ACT WorkKeys Applied Mathematics Outcome (scale score). An analysis of the unconditioned (null) model indicates that the interclass correlation coefficient (ICC) for the ACT WorkKeys Applied Mathematics Outcome is .07, which suggests that the school in which a student is learning accounts for 7% of the variance on this outcome. As noted above, when ICCs are zero or near zero, it is more appropriate to focus on a single-level model rather than a multi-level model.

To calculate the single-level model, we conducted a mixed-model linear analysis with 8th grade AS, poverty, and race as covariates, NTN school (vs. non-NTN) as the predictor, and ACT WorkKeys Applied Mathematics Outcome (scale score) as the outcome variable. The results suggest that participants in the New Tech schools had significantly higher scores on this outcome than did participants in the control condition, t (808) = 3.40, p = .001.[1]

For the sake of completeness, we also report the results of a two-level HLM in Table 4 for this outcome variable. Consistent with the single-level model described previously, the results of the multi-level model also suggests that participants in the New Tech schools had significantly higher scores on this variable than did participants in the control condition, t (6.24) = 2.86, p = .03.

ACT WorkKeys Reading for Information Outcome

Statistical results for this variable are reported in Table 5. To assess the effect of the NTN model on reading skills relevant to entering the workforce, investigators analyzed participants' scores from the ACT WorkKeys Reading for Information Outcome (scale score). An analysis of the unconditioned (null) model indicates that the interclass correlation coefficient (ICC) for ACT WorkKeys Reading for Information Outcome is .06, which suggests that the school in which a student is learning accounts for 6% of the variance on this outcome. As noted above, when ICCs are zero or near zero, it is more appropriate to focus on a single-level model rather than a multi-level model.

To calculate the single-level model, we conducted a mixed-model linear analysis with 8th grade AS, poverty, and race as covariates, NTN school (vs. non-NTN) as the predictor, and ACT WorkKeys Reading for Information Outcome (scale score) as the outcome variable. The results suggest that participants in the New Tech schools had significantly higher scores on this outcome than did participants in the control condition, t (808) = 3.68, $p < .001$.[1]

For the sake of completeness, we also report the results of a two-level HLM in Table 5 for this outcome variable. In contrast with the single-level model described previously, the results of the multi-level model indicated no difference between participants in the New Tech schools and control schools on this variable, t (5.87) = 1.29, p = .25. As noted above, the discrepancy between the lack of significant outcome here compared to the single-level model is likely due to a biased outcome in the HLM analysis due to small cluster size (Maas & Hox, 2005).

ACT WorkKeys Locating Information Outcome

Statistical results for this variable are reported in Table 6. To assess the effect of the New Tech model on information skills relevant to entering the workforce, investigators used the ACT WorkKeys Locating Information Outcome (scale score). An analysis of the unconditioned (null) model indicates that the interclass correlation coefficient (ICC) for ACT WorkKeys Locating Information Outcome is .07, which suggests that the school in which a student is learning accounts for 7% of the variance on this outcome. As noted above, when ICCs are zero or near zero, it is more appropriate to focus on a single-level model rather than a multi-level model.

To calculate the single-level model, we conducted a mixed-model linear analysis with 8th grade AS, poverty, and race as covariates, NTN school (vs. non-NTN) as the predictor, and ACT WorkKeys Locating Information Outcome (scale score) as the outcome variable. The results suggest that participants in the New Tech schools had significantly higher scores on this outcome than did participants in the control condition, t (808) = 4.27, $p < .001$.[1]

For the sake of completeness, we also report the results of a two-level HLM in Table 6 for this outcome variable. In contrast with the single-level model described previously, the results of the multi-level model indicated no difference between participants in the New Tech schools and control schools on this variable, t (6.18) = 1.46, p = .19. As noted above, the discrepancy between the lack of significant outcome here compared to the single-level model is likely due to a biased outcome in the HLM analysis due to small cluster size (Maas & Hox, 2005).

Discussion

This study utilized a quasi-experimental design to measure the efficacy of the NTN model on students' academic and workforce skills. The results of a single-level model analysis suggests that the New Tech schools outperformed control schools on the ACT Test, WorkKeys Mathematics Outcome, WorkKeys Reading for Information Outcome, and WorkKeys Locating Information Outcome measures. The results for a multi-level analysis were mixed. Specifically, the HLM analyses suggest that New Tech schools outperformed control schools on the ACT Test and WorkKeys Mathematics Outcome, but not on the WorkKeys Reading for Information and WorkKeys Locating Information Outcome. This discrepancy is likely due to the small cluster size and small ICCs, which render the outcomes from HLM in this data set suspect (Gellman & Hill, 2007; Maas & Hox, 2005).

Limitations of the Study

Like any evaluation of this kind, this study is not without its limitations. The biggest limitation is that this study is not a randomized controlled trial (RCT), the gold standard for research studies of model efficacy, as it was impossible to randomly assign students to NTN treatment. Thus, the research team used what it thought was the second-best method, a quasi-experimental design that matches treatment and comparison samples in order to ensure baseline equivalence. Even though the design did not utilize a RCT design, the research team calculated baseline equivalence before the study commenced to help ensure apples-to-apples comparisons. In terms of fidelity to the model, while fidelity was established at the four schools in an earlier study, this measurement occurred several years prior to data collection. The situation at the schools could have changed in the intervening years. Additionally, while there is general agreement that outcomes of workforce skills are critically important to measure and include in education studies, there is still debate regarding the best way to measure them. ACT WorkKeys is a validated and reputable measure; however, it is not a perfect measure. Finally, the measurement of outcomes was hampered by the frequent changing of the testing regime for the state included in the study and the testing of only certain grades for certain subjects. Because of this inconsistency, and the resulting small sample sizes, other grades were excluded from the study and only 11th graders were included since all students in the state were required to take ACT and ACT WorkKeys in 11th grade.

Suggestions for Future Research

There are very few studies of NTN design efficacy when considering the number of students involved in NTN schools and the popularity of project-based learning, independent of NTN, in the classroom. Because of this, there is a need for more measurement of NTN design model efficacy in order to establish a solid research base. In addition, because the model is so focused on career and college ready outcomes (non academic outcomes), researchers need to find more ways to undertake this type of measurement. It is hard and many times expensive to do right, but it is critical given the skills and dispositions required of a 21st century high school graduate. Future studies need to test ways to measure these types of outcomes and integrate findings into schools in useful ways.

Conclusions

The results of this study showing advantages in academic outcomes and some workforce skills outcomes for NTN students suggests the potential of the NTN design, if implemented with fidelity, to serve students of all income levels and backgrounds by positively impacting their academic achievement and workforce skills development. While limitations to this study exist, as described above, and more research is needed around the components of the NTN design and the NTN design as a whole, this study demonstrates that the NTN design is a promising model to consider when looking at models to moderate the effects of poverty and to prepare all subgroups of students for college and the 21st century workforce.

Notes

1. Results of the independent effects of the covariates on the outcome measures are reported in Tables 3-6. The focus of the present research is the effects of the New Tech intervention on

the key outcome variables, so the independent effects of covariates are not discussed in detail here.

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Table 1. Baseline Equivalence of Covariates

Baseline Measure	Control Condition			Treatment Condition			Statistic (t-value or χ^2)	P value
	N	M	SD	N	M	SD		
PASS	588	629.06	46.29	236	634.49	39.93	t (822) = 1.58	.114
Proportion in Poverty	588	.63		236	.59		1.47	.225
Proportion Minority	588	.48		236	.54		2.51	.113
Proportion Female	588	.47		236	.45		.212	.645

Note: There were no statistical differences between treatment and control conditions on these baseline measures at p = .05 or less, two-tailed.

Table 2: Sample Characteristics, Unadjusted Means, and Standard Deviations

Baseline Measures	Control Condition				Treatment Condition			
	Sample Sizes		Sample Characteristics		Sample Sizes		Sample Characteristics	
	Unit of Assignment = School	Unit of Analysis = Individual	Mean	SD	Unit of Assignment = School	Unit of Analysis = Individual	Mean	SD
ACT Composite Percentage	4	588	28.43	24.57	4	236	34.08	22.28
Workkeys Math Scale Score	4	581	76.62	5.19	4	232	77.73	4.94
Workkeys Reading Scale Score	4	581	78.50	3.28	4	232	79.35	2.58
Workkeys Info Scale Score	4	581	75.82	3.04	4	232	76.74	2.79

Table 3. HLM Analyses of ACT Test Composite Score

Outcome	Unconditioned Model		Level 1 Model		Full Level 2 Model	
	Parameter Estimate	SE	Parameter Estimate	SE	Parameter Estimate	SE
Fixed Effects						
Intercept	30.587*	2.02	-229.56*	7.19	-229.12*	7.25
New Tech Treatment			3.63*	1.03	3.56*	1.55
8th Grade Achievement			.42*	.01	.41*	.01
Poverty			-2.42*	1.04	-2.47*	1.04
Race			-5.66*	1.01	-5.99	1.07
Variance Estimates						
Residual Variance	558.10	27.63	177.07	8.75	174.93	8.67
Intercept Variance	25.83	17.38			2.58	2.37
ICC	.04				.003	

Note: Parameter estimates with an * are statistically significant at p = .05 or less, two-tailed.

Table 4. HLM Analyses of WorkKeys Applied Mathematics Outcome Scale Score

Outcome	Unconditioned Model		Level 1 Model		Full Level 2 Model	
	Parameter Estimate	SE	Parameter Estimate	SE	Parameter Estimate	SE
Fixed Effects						
Intercept	76.95*	.53	30.25*	1.85	30.25*	1.85
New Tech Treatment			.90*	.31	.89*	.31
8th Grade Achievement			.08*	.003	.08*	.002
Poverty			-.67*	.27	-.67*	.27
Race			-1.82*	.26	-1.83*	.27
Variance Estimates						
Residual Variance	25.30	1.26	11.51	.57	11.48	.57
Intercept Variance	1.91	1.23			.05	.10
ICC	.07				.004	

Note: Parameter estimates with an * are statistically significant at p = .05 or less, two-tailed.

Table 5. HLM Analyses of WorkKeys Reading for Information Scale Score

Outcome	Unconditioned Model		Level 1 Model		Full Level 2 Model	
	Parameter Estimate	SE	Parameter Estimate	SE	Parameter Estimate	SE
Fixed Effects						
Intercept	78.83*	.29	48.49*	1.18	48.91*	1.20
New Tech Treatment			.63*	.17	.54	.41
8th Grade Achievement			.05*	.002	.05*	.002
Poverty			-.02	.17	-.02	.17
Race			-.38*	.17	-.61*	.18
Variance Estimates						
Residual Variance	9.33	.47	4.76	.24	4.56	.23
Intercept Variance	.56	.37			.28	.19
ICC	.06				..06	

Note: Parameter estimates with an * are statistically significant at p = .05 or less, two-tailed.

Table 6. HLM Analyses of WorkKeys Locating Information Scale Score

Outcome	Unconditioned Model		Level 1 Model		Full Level 2 Model	
	Parameter Estimate	SE	Parameter Estimate	SE	Parameter Estimate	SE
Fixed Effects						
Intercept	76.28*	.31	48.93*	1.17	49.91*	1.19
New Tech Treatment			.72*	.17	.71	.49
8th Grade Achievement			.04*	.002	.04*	.002
Poverty			-.17	.17	-.19	.17
Race			-.51*	.17	-.95*	.18
Variance Estimates						
Residual Variance	8.54	.43	4.66	.23	4.38	.21
Intercept Variance	.66	.42			.42	.27
ICC	.07				.09	

Note: Parameter estimates with an * are statistically significant at p = .05 or less, two-tailed.