Part B

Supporting Justification Request for OMB Clearance of Information Collection Forms for:

The Effects of a Hybrid Secondary School Course in Algebra I on Teaching Practices, Classroom Quality and Adolescent Learning

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Submitted to:

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THE EFFECTS OF A HYBRID SECONDARY SCHOOL COURSE IN ALGEBRA I ON TEACHING PRACTICES, CLASSROOM QUALITY AND ADOLESCENT LEARNING

INTRODUCTION

This submission is a request for approval of data collection instruments in support of an evaluation of an Algebra I intervention the applicant proposes to implement in 60 high needs high schools located primarily in rural areas across the Commonwealth of Kentucky (KY). The project is sponsored by the Institute of Education Sciences within the US Department of Education and will be conducted by the Regional Educational Laboratory Appalachia (REL-A) administered by the CNA Corporation (CNAC).

This intervention involves implementation of a hybrid instructional approach in all high school Algebra I classrooms in intervention schools. The hybrid approach combines online instruction with face-to-face classroom instruction for students. Intervention teachers will be supported by extensive and ongoing professional development focused on implementing effective hybrid classes and on research-based instructional practices for Algebra I.

Algebra I has emerged in recent years as a critical gatekeeper course, necessary to prepare students for the rigorous mathematics curriculum required for high school graduation and successful post-secondary experiences. Therefore, providing Algebra I teachers with the very best resources and professional development to ensure effective instruction has become a priority in Kentucky and across the nation. This research study is designed to test, through a randomized control trial, experimental design, an approach that combines online and technology enhanced instruction with face-to-face classroom instruction to address this need. This hybrid or "blended" approach has shown promising results in Kentucky and in research elsewhere.

CNAC, as the lead organization for the research study, has comprised a team supported by researchers at Education Innovations (EI) and the University of Virginia (UVA). In addition, the Collaborative for Teaching and Learning (CTL) and Kentucky Virtual High School (KVHS) will implement the intervention and support recruitment efforts. Teachers receiving the intervention will apply the hybrid approach using the online course curriculum in Algebra I selected by the Kentucky Department of Education (KDE) and KVHS. This curriculum is an off-the-shelf product created by university faculty affiliated with the University of California College Prep Online and the Center for Digital Innovation, UCLA and was chosen for its quality and content and because it is customizable, allowing educators to modify the content as needed. This last feature has particular appeal for going to scale if the intervention is shown to be effective, as the content can be tailored to meet the unique needs of different school systems. The courseware has gone through an external quality control protocol by the National Repository of Online Courses and has been reviewed by curriculum specialists at the KDE for quality and alignment with national and state standards for Algebra I instruction. The results on improved instructional practices, classroom quality, and student learning will be compared to those in control sites in which Algebra I instruction will continue as it has with normal classroom instruction.

Teachers will receive professional development through face-to-face training led by a master teacher in mathematics and distance training sessions supported by an online curriculum. Spotlight On Algebra I, developed by the Southern Region Education Board with funding from the AT&T Foundation, is the online courseware that provides the framework for professional development. Training and support for teachers will begin in the summer and continue throughout the intervention school year. Use of "Spotlight" is expected to improve teacher skills and instructional methods in Algebra I, and is expected to work synergistically with the hybrid curriculum for the following reasons: (1) the professional development experience provides models of instructional methods for teachers using online content; (2) it focuses on Algebra I, allowing teachers to focus on and improve their subject-specific instructional methods; and (3) it provides a vehicle (framework) for regular sustained activities and discussions for participating teachers (the community of learners). Further, coupling professional development in research-based instructional practices with hybrid instruction is expected to change the classroom environment, helping teachers break old habits of instruction and facilitating adoption of improved, research-based practices. Finally, the hybrid model provides tools to adopt more effective instructional approaches, including flexible instruction and formative assessments to help teachers meet the needs of different learners.

Research Hypotheses

This study poses five hypotheses focusing on the impact of the Algebra I intervention on teaching practices, classroom quality, and student learning.

The Hybrid Algebra I approach will:

Hypothesis 1: *Increase the use of research-based best practices for Algebra I as documented in the Algebra I instructional standards.*[1]

Hypothesis 2: *Improve classroom quality as seen in increased levels of student interest and engagement and academically focused class time.*

Hypothesis 3: *Increase student achievement in learning Algebra I content and skills.*

Additional hypotheses:

4: *Achievement gains associated with the online curriculum may vary among students with different characteristics (gender, race/ethnicity, income as measured by free or reduced-price lunch status, LEP, LD/SPED, age).*

5: *The beneficial effects of the intervention on student outcomes will extend to the post-intervention year, as measured in terms of improved performance on the 10th grade PLAN assessment, mathematics course-taking, mathematics course grades, and improved high school continuation rates.*

[1] Based on National Council of Teachers of Mathematics, North American Council for Online Learning (NACOL), ISTE NETS-T and NETS-S, and KY Algebra I standards.

Methodology

To address the hypotheses in this evaluation, the research team will: (1) identify the universe of schools in Kentucky that meet the criteria for inclusion in the study; (2) recruit eligible schools; (3) randomly assign schools to treatment and control conditions; (4) collect administrative and survey data, conduct classroom observations, administer a post-treatment assessment of Algebra I knowledge and skills; and (4) analyze the data and report the findings from our analyses. A summary of key activities appears in Table 1.

Table 1. Schedule of Activities

Activity	Schedule
Create District and School Pool for Site Selection Recruitment	Spring - Fall 2007
District and School Recruitment (pending OMB approval)	Winter-Spring 2008
District IRB	Spring - Fall 2008
District and School MOUs	Spring 2008
Random Assignment	Spring 2008
Start Intervention	Summer 2008 (Teachers)
Start Collection of administrative data	Fall 2008
Collect Classroom observations, Surveys and Algebra I Post-test	Spring 2009
Collect administrative data on longer-term outcomes	Winter 2010
Final Report of Findings	Fall 2010

SUPPORTING STATEMENT B – COLLECTION OF INFORMATION EMPLOYING STATISTICAL METHODS

1. Respondent Universe and Sampling Procedures

The study focuses on the impacts of hybrid instruction in high needs schools in which Algebra I is taught in the 9^{th} grade. For the purposes of this study, we define "high needs" in poor performance in mathematics. Schools that are considered to be poor performers in mathematics are identified as those in which fewer than 65 percent of students are proficient in mathematics, as indicated by either the nationally norm-referenced CTBS/5 exam in mathematics given to 9^{th} graders in school year 2005-2006, or by the criterion-referenced Kentucky exam (the KCCT) for 8^{th} or 11^{th} graders that share the school with the 9^{th} graders. These criteria result in a preliminary list of 210 eligible schools that will be contacted to determine their interest and ability to participate in the study.

In addition to the criteria described above, schools that express interest in participation in the study will be asked about their capacity to support the technology-based intervention. The availability of technology in schools is not expected to be a limiting factor for the applicant pool. Rural and low-income schools have amassed considerable technology resources through the federal e-rate program. That program has had a direct effect on the almost universal availability of technology in high-needs schools. [2] The widespread availability of adequate technology in high schools has been further corroborated by KDE. In addition KVHS, which offers online courses throughout KY, will provide technical assistance to schools in support of the intervention.

Recruiting eligible schools. Based on our power analysis (described below), and the estimated response rate, we established an initial target sample of 60 schools.

The full initial sample of 60 participating schools will include approximately 120 Algebra I teachers and about 13,500 students who are enrolled in 9^{th} grade Algebra I classes. After accounting for attrition/non-response, we anticipate a minimum sample size from which we will collect data for analysis of 50 schools, 100 teachers and 10,800 students. This sample size reflects an 83 percent response rate for teachers and schools and an 80 percent response rate for students. These response rates provide us with a conservative estimate of our final sample and give us a cushion to help to ensure that we reach the desired levels of statistical power for our analyses.

Study researchers will collect administrative data from the Kentucky Department of Education (KDE), the school districts, and the schools, depending on where specific files are stored. In particular, KDE will provide demographic data for students; districts will provide 8^{th} and 10^{th}-grade test scores, and schools will provide enrollment data. The administrative data will be collected over the period of Fall 2008 to Winter 2010.

[2] In all four states in this region, 99 percent of the elementary and secondary schools have Internet access. In Kentucky and Tennessee, over 86 percent have broadband access. Last year, the four states received a total of $170 million in E-Rate grants to support their own expenditures for wiring classrooms, Internet access and telecommunications services. (Technology Counts, 2005, as reported in Ed Week 5 May 2005).

In addition to the administrative data described above, surveys, site observations, and a post-test of student knowledge and skills will be collected from study participants. These data will be collected in Spring 2009. Table 2 summarizes information about the respondent universe and anticipated sample sizes by data source.

Table 2. Potential Respondent Universe (*N*) and Treatment (T)/Control (C) Sample (*n*) and expected number of respondents (*R*)*

	Schools		Teachers		Students	
Universe	*N* = 210		*N* = 420		*N* = 47,250	
Initial Sample	*n* = 60		*n* = 120		*n* = 13,500	
Respondents	*R=50*		*R=100*		*R=10,800*	
Data Source	T	C	T	C	T	C
Administrative records					5,400	5,400
Researcher Site Observations (SOM/AQA)	25	25	50	50	5,400	5,400
Treatment Teacher Survey			50			
Control Teacher Survey				50		
Algebra Posttest					5,400	5,400

*Source of Estimates below:
Schools: *N* = all regular Kentucky schools with 9th grade Algebra I classes and meeting eligibility requirements for student proficiency rates in mathematics; *n* = initial sample of schools; *R*= number of schools remaining after attrition.
Teachers: *N* = total schools (from above) x 2 Algebra 1 teachers per school; *n* = total initial sample schools x 2 Algebra 1 teachers per school (rounded up), *R*= number of teachers remaining after attrition.
Students: *N* = total number of Algebra 1 students in universe, based on an average enrollment of 225 students per school; *n* = total in initial sample, *R* = number of students remaining after attrition.

2. Statistical Methods for Sample Selection and Degree of Accuracy Needed

a. Stratification and Sample Selection

Schools will be recruited from the full list of eligible schools, to apply to participate in the study. Recruiting from the list will continue until we reach our target of 60 schools. The schools will be recruited in the winter and spring of school year 2007-2008 for participation during 2008-2009 implementation year. Participating schools will be randomly assigned to treatment or control groups, with an equal chance of assignment to either. Within each participating school, all Algebra I teachers, classrooms and students will participate in the study. Based on characteristics of schools that are in the eligible universe, we project a mean of: 2 Algebra I teachers per school (120 teachers, with 60 per treatment condition), with an average of 225 students per school, for a total of 13,500 students in the initial sample.

b. Estimation Procedures

The Table 3 summarizes the hypotheses, data sources, data collection procedures and analyses that will be conducted to determine impacts of the intervention on teaching practices, classroom quality, and adolescent learning. In each case, we will use a two-tailed test of statistical significance, and alpha value of .05 to determine statistical significance. Where multiple indicators are collected, a Bonferroni-Hochberg correction also will be used.
Primary hypotheses:

The use of KVHS' online courseware as a central instructional device for adolescent students of Algebra I in a technology-enhanced traditional secondary classroom setting, coupled with professional development for teachers in research-based practices in Algebra I and hybrid instruction to support its effective use will:

Table 3 Primary Hypotheses, Data Sources, Data Collection Procedures and Analyses

Primary Hypotheses	Data Sources	Data Collection Procedure	Analysis
Increase the use of research-based best practices for Algebra I as documented in the Algebra I instructional standards.* Improve classroom quality as seen in increased levels of student interest and engagement and academically focused class time.	**1) School Observation Measure** (SOM©). The SOM is used to collect data regarding overall classroom activities. **2) Algebra I Quality Assessment** (AQA). The AQA is used to record more detailed information about observed use of the Algebra I instructional standards.* **3) Teacher Surveys** will be used to collect Treatment and Control teacher perceptions of the Algebra I approach they use (Hybrid vs. district curriculum) and use of the Algebra I instructional standards.*	Observations of full (approximately 1 hour) Algebra 1 classes will be conducted in up to 5 classrooms during 1-day visits to each of the 30 Treatment and 30 Control schools. The 1) SOM and 2) AQA will be used to conduct the 300 classroom observations, which will involve observing nearly every Treatment and Control teacher for two or more full class periods. Education Innovations will conduct classroom observations and administer teacher surveys under direction of Dr. Deborah Lowther during spring 2009. 3) Teacher surveys will be collected by classroom observers on the day of their school visit in spring 2009.	Observation data from the 1) SOM and 2) AQA will be analyzed using Analysis of Variance (ANOVA) in which between-group (hybrid vs. control) differences will be investigated for each of the strategies assessed. Effect sizes will also be computed using Cohen's *d*. To protect against the increased likelihood of Type I error, the Bonferroni-Hochberg step-down procedure to adjust statistical significance will be used. 3) Teacher survey data will be analyzed by means of ANOVA with Bonferroni-Hochberg step-down procedure to adjust statistical significance.
Increase student achievement in learning Algebra I content and skills.	**1) 8th grade scores on the KCCT**. **2) Algebra I Assessment scores** **3) Student enrollment data**	1) Researchers will collect test scores from electronic administrative files stored by districts. 2) Trained external proctors will conduct onsite administration of the Algebra 1 Assessment in May 2009 in each of the Treatment and Control Schools. 3) Student enrollment data will be collected by researchers from participating schools at the end of each marking period. These data will be used to control for amount of exposure to the intervention in the analysis.	A 2-level *HLM* model will be used as a baseline model to assess the overall effect of treatment while controlling for the school average performance on the pretest (school-level covariate).
Additional Hypotheses Achievement gains associated with the online curriculum may vary among students with different characteristics (gender, race/ethnicity, income as measured by free or reduced-price lunch status, LEP, LD/SPED, age).	**1)) 8th grade scores on the KCCT**. **2) Algebra I Assessment scores** **3) Student enrollment data** **4) Student characteristics** (e.g., gender, race/ethnicity, income as measured by free or reduced-price lunch status, LEP, LD/SPED, and age).	1), (2), (3) Same as above. 4) Researchers will collect administrative data in electronic files from KDE using procedures that ensure protection of student information.	A comprehensive *HLM* model will be used to evaluate if the treatment has different effects for subgroups of students (e.g., students with different math proficiency; ethnic majority vs. underserved minority students, students with different SES background).
The beneficial effects of the intervention on student outcomes will extend to the post-intervention year, as measured in terms of improved performance on the 10th grade PLAN	**1) 8th grade scores on the KCCT**. **3) Student enrollment data** **4) Student characteristics** (e.g., gender, race/ethnicity, income as measured by free or reduced-price	1), (3), (4) Same as above.	A comprehensive *HLM* model will be used to evaluate evidence of systematic differences in student outcomes between treatment versus control groups.

Primary Hypotheses	Data Sources	Data Collection Procedure	Analysis
assessment, mathematics course-taking, mathematics course grades, and improved high school continuation rates in the post-intervention school year.	lunch status, LEP, LD/SPED, and age). **5) Indicators of longer-term student outcomes, including 10th grade PLAN Math Score, post-intervention math course taking, math grades in first 2 marking periods of the post-intervention school year, HS enrollment in January of 10th grade.**	5) Researchers will collected student administrative records from districts or schools for use in statistical analyses of longer-term student outcomes of the intervention.	

c. Degree of Accuracy Needed

We conducted a power analysis under a range of assumptions in order to determine appropriate sample sizes for this study. These assumptions are conservative and incorporate a cushion for participant attrition to ensure that the resulting data will yield reliable results. In particular, we assume that on average, 180 students are clustered within each of the 50 to 60 schools that comprise the final (respondent) sample.

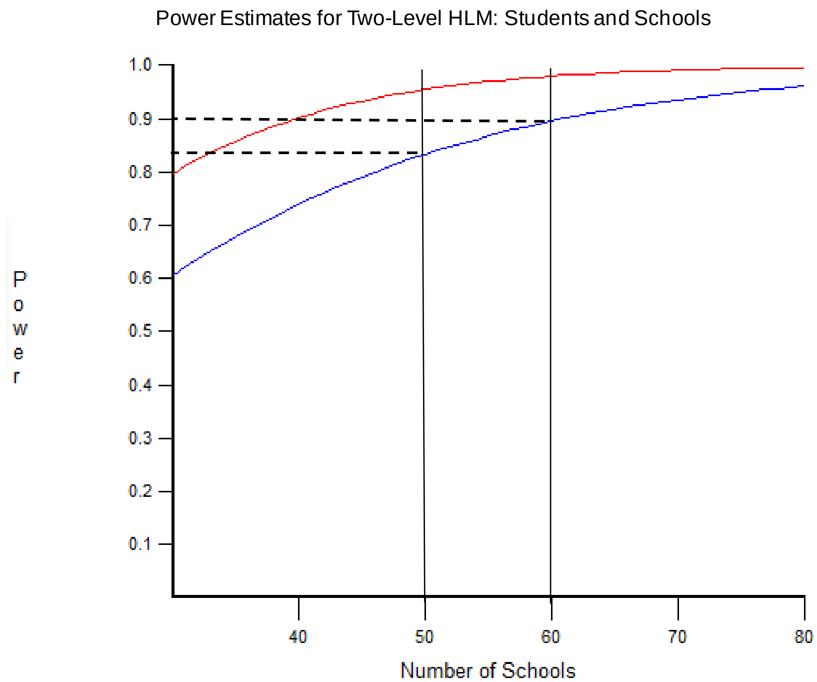
The power analysis for our key research question (impact on Algebra I student learning) follows. We assume that individual students account for 90 percent of variation in the outcome variable (test score), while the remaining 10 percent of variation is accounted for by clustering at the school level. This means that the *ICC* is estimated to be 0.10. This estimate is based on the consideration that most of our targeted schools are high-needs high schools in rural areas of Kentucky. As such, there is some uniformity across these targeted schools. So compared with a situation where ALL high schools in a state are considered, the variation among these targeted high-needs schools should be smaller than that among high schools in general.

We plan to use *at least* one aggregated 2nd level (i.e., school level) covariate in the model. The cluster level covariate is the 8th grade math scores aggregated at the school level (i.e., the average pre-test math score for all the students in a school). Research on school academic achievement has repeatedly shown that pre-test scores are highly correlated with post-test scores, thus substantially correlated with cluster (i.e., school) means of the post-test scores. We assume that this relationship is $R^2_{L2}=0.49$.

We assume two levels of effect size: $\delta=0.20$ and $\delta=0.25$. These two effect size levels represent small effect sizes as typically discussed in social and behavioral science in general (e.g., Cohen, 1988). Because the hybrid approach is rather new, there is limited information about the magnitude of its effectiveness. In studies that have been reported, the results appear to be large, but do not convert readily to effect sizes. For example, Cincinnati Public Schools' Virtual High School, an alternative school serving drop out recovery students, and over age students used a hybrid approach in the 2005-2006 school year. The school reported that the percentage of 10th grade students passing the statewide graduation exam grew substantially in each of five tested subject areas, reducing the gap in performance between the Virtual High School and other schools in the district. In mathematics, for example, the pass rate increased 22.9 percentage points, from 35.9 to 58.8 percent. (www.ode.state.oh.us/reportcard). A meta-analysis that included 42 studies of the effects on students of the use of computer assisted instruction and online activities in conventional educational settings reported a weighted mean effect size of .448 for cognitive outcomes. Waxman, Lin and Michko (2003) Thus, the MDE's used for determining sample sizes for the current study seem reasonable. Given these parameters and assumptions as detailed above, we can see that the proposed design and analysis has sufficient power for detecting the hypothesized effect sizes. Without attrition at the school level, the minimum power level is about **0.90** (as indicated by the upper dashed arrow imposed on the lower power curve, where the effect size is assumed to be .20). Even with the planned 83 percent response rate at the school level (60 schools dropped to 50 schools), we can still expect a power level of about **0.83** for the smaller effect size. These power levels are considered sufficient in applied research and should be considered as realistic and conservative estimates.

Figure 1: Power Curves for Cluster Randomized Trials

The lower curve shows power for an effect size of .20. The upper curve shows power for an effect size of .25.



Power curves are based on a hypothesized effect size of .20 and analytic approach described in, "Optimal Design for Longitudinal and Multilevel Research-V1.55", Raudenbush, S. W., Spybrook, J., Liu, X.F., & Congdon, R., 2005.

d. Unusual Problems Requiring Specialized Sampling Plans

None.

e. Use of Periodic Data Collection Cycles to Reduce Burden

Not applicable.

3. Methods to Maximize response rates and Deal with Nonresponse

We will use data from the most recent Common Core of Data to identify all schools in KY with a 9^{th} grade. We will merge these data with data from the Kentucky Department of Education website on school performance in mathematics and use the resulting data file to select for possible inclusion in the study all regular high schools in Kentucky in which (1) Algebra I is taught (and will continue to be taught for the duration of the study) to 9^{th} graders and (2) fewer than 65 percent of students are proficient in mathematics, as indicated by either the CTBS/5 exam for 9^{th} graders or the KCCT exam for 8^{th} or 11^{th} graders, using the most recent available data.

Recruiting strategy

Successful recruiting of randomly selected schools is critical to the sample design. The research team has set aside ample resources to ensure participation. The Collaborative for Teaching And Learning (CTL) will have a critical role in implementation of the recruiting strategy under the direction of the PI.

- CTL will develop awareness for the study by organizing sessions at professional conferences widely attended by Kentucky teachers of mathematics, including the fall 2007 Kentucky Council of Teachers of Mathematics and the winter 2008 Kentucky Teaching and Learning Conference (KTLC).
- CTL will draft a letter for signature from the Chief State School Officer to qualifying districts and schools informing them of their eligibility for the study and encouraging them to participate (see Exhibit A).
- Letters will be mailed to the 210 building administrators that are eligible for participation in the study, as well as their district superintendent. The letters will arrive in a large KDE envelope with a brochure describing the intervention and promoting its value, and a "commitment statement" for interested teachers and schools to complete (Exhibit A). A pre-stamped and addressed envelope will be included in the package for applicants.
- Commitment statements will be screened by CTL to ensure that schools meet minimum requirements for participation.
- Follow-up reminders will be sent by e-mail from the commissioner, KDE, directly to all 210 eligible schools (Exhibit A).
- CTL will contact district leaders and school principals by phone to answer questions and further encourage participation.
- CTL will arrange for presentations at each of 7 regional cooperative meetings in spring 2008. Superintendents from all districts in each region attend these meetings. This forum will be used to familiarize superintendents with the intervention and the study. Two members of the research team (a researcher and a practitioner involved in implementation) will give the presentation and answer questions. A template for scheduling that lists contacts for each regional cooperative appears in Appendix A.
- CTL will arrange for similar follow-up meetings for principals and teachers, following the cooperative meeting in each region.

Our goal is to recruit 60 schools from the 210 schools that meet our eligibility criteria. The Collaborative for Teaching and Learning (CTL) is an excellent choice for ensuring successful recruiting of our selected sites. CTL is headed by a former associate commissioner of education in the state, and has the contacts and reputation that will help her recruit the selected schools for the study. In addition, CTL has several projects that has put them in direct contact with schools that would be eligible for participation in the experiment. In particular, CTL worked directly with a number of networks of schools and practitioners through GEAR UP and Western KY Partnership Gear Up schools. These are schools with more than 50 percent of their students on free and reduced lunch, and an overall accountability score in dire need of improvement.

Response Rate

Because school participation requires teachers and their principals and superintendents to volunteer to participate, the anticipated response rate among participating schools is expected to be high for this collection. Additional intervention and research design elements that will contribute to a high response rate include: (1) an intervention that incorporates frequent contacts throughout the intervention with a master teacher and a learning community of other participating teachers for professional development; (2) a professional development program that is built around subject matter and pedagogy to improve teachers' current classroom practices; (3) technology supports from KDE to reduce the impact of technical glitches that could impede program success, or reduce teacher enthusiasm for the intervention; (4) orientation meetings for treatment and control teachers; and (5) each participating teacher will be asked to review an information sheet describing their responsibilities under the study. (Please see Exhibit B.)

While the above elements will help to reduce attrition from the program, data collection has also been designed specifically to capture as many responses as possible. In particular, both teacher and student questionnaires will be administered during researcher site visits to schools. Student assessments will be given during the regular school day. As a result, there is no need to mail/e-mail responses, and it will be a specific responsibility of the visiting researcher to collect data from all measurement instruments.

4. Tests of Procedures or Methods to be Undertaken

Classroom observation tools (SOM, and a form similar to the AQA) have been used in multiple research studies and have validation and reliability information in addition to norms. The Algebra 1 teacher questionnaires have been pre-tested by nine Algebra 1 teachers in Kentucky schools. The average completion time for the teacher survey was 9 minutes. The teachers who completed the surveys for the pretest were asked to indicate any items that were unclear and offer suggestions for improving the surveys. The pretest participants indicated that the surveys were clear and easy to understand. No teachers provided suggestions for revisions.

5. Individuals Involved

Name	Role	Title	Telephone
Linda Cavalluzzo	PI	Senior Researcher, The CNA Corporation	703-824-2197
Deborah Lowther	Co-PI	Assoc. Professor, University of	901-678-5645

		Memphis, and Senior Researcher, Education Innovations	
Xitao Fan	Methodologist	Professor, Research, Statistics and Evaluation, The Curry School of Education, University of Virginia	434-243-8906
Michael Puma	External evaluator	Senior Evaluator, Chesapeake Research Associates, LLC	410-897-0968
Johannes Bos	Technical Working Group (TWG)	President and CEO, Berkeley Policy Institute	510-465-7884
Laura M. Desimone	TWG	Professor of Public Policy and Education, Peabody College of Education and Human Development Vanderbilt University	615-322-5521
Barbara Goodson	TWG	Senior Researcher, Abt Associates	617-349-2811
Rebecca Maynard	TWG	University Trustee Chair, Professor of Education and Social Policy, University of Pennsylvania	215-898-3558
Samuel Stringfield	TWG	Nystrand Center of Excellence in Education, University of Louisville	502-852-0615

References

Virtual High School, School Year Report Card (2004-2005 and 2005-2006). http://www.ode.state.oh.us/reportcard/ [report card not cited in part A, but plenty of references to the virtual high school]

Waxman, H.C., Lin, M., & Michko, G. (2003). A Meta-analysis of the Effectiveness of Teaching and Learning with Technology on Student Outcomes. Learning Point Associates http://www.ncrel.org/tech/effects/

Appendix A

Informational Meeting Schedule Template for Kentucky Educational Cooperatives

Kentucky Educational Cooperatives – Mar-April Board Meetings

Educational Cooperative	Executive Director	Phone/Fax/email	Hybrid Algebra Study Presentation 10-15 minutes--presenters
Central Kentucky Education Cooperative University of Kentucky, 43 Dickey Hall Lexington, KY 40506-0017	Donald Pace	Ph: 859-257-3244 Fax: 270-745-6892 dwpace@pop.uky.edu	TBD
Green River Regional Educational Cooperative (GRREC) Western KY University 1906 College Heights Blvd. #21031 Bowling Green, KY 42101-1031	Liz Storey	Ph: 270-745-2451 Fax: 270-745-5199 Liz.Storey@grrec.ky.gov	TBD
Kentucky Educational Development Corporation (KEDC) 904 W. Rose Road Ashland, KY 41102-7104	Stan Riggs	Ph: 606-928-0205 x 2201 Fax: 606-928-3785 Stan.Riggs@kedc.org	TBD
Kentucky Valley Educational Cooperative Hazard Community College 1 Community College Drive Hazard, KY 41701	Jeff Hawkins	Ph: 606-439-1119 x 26 Fax: 606-439-1322 Jeff.Hawkins@kentuckyvalley.org	TBD
Northern Kentucky Cooperative for Educational Services 5516 East Alexandria Pike Cold Spring, KY 41076	Dawn Tackett	Ph: 859-442-8600 x 16 Fax: 442-7015 Dawn.Tackett@nkces.org	TBD
Ohio Valley Educational Cooperative (OVEC) P.O. Box 1249 Shelbyville, KY 40066	Leon Mooneyhan	Ph: 502-647-3533 x 251 Fax: 502-647-3581 LMooneyhan@ovec.org	TBD
West Kentucky Educational Cooperative Murray State University 420 Wells Hall Murray, KY 42071-3340	John Settle	Ph: 270-809-6978 Fax: 270-809-2485 John.Settle@wkec.org	TBD
South East/South Central Educational Cooperative Eastern KY University 417 Bert Combs Building Richmond, KY 40475	William Thames Tom Bonny-Asst. Director	Ph: 859-622-2581 Fax: 859-622-6526 William.Thames@eku.edu Tom.Bonny@eku.edu	TBD