

# **Energy Express**

## **2021-24 Evaluation**

**Conducted by**

Ben Edmonds, Ph.D.  
Emeritus Faculty  
Indiana University

**Submitted to**

Mark Swiger  
Director, Energy Express

November 30, 2023

# TABLE OF CONTENTS

|                                | Page |
|--------------------------------|------|
| Executive Summary              | 2    |
| Introduction                   | 4    |
| Evaluation Overview            | 6    |
| Attendance                     | 13   |
| Evaluation Results             | 14   |
| Discussion and Recommendations | 22   |
| References                     | 28   |
| Appendix A                     | 29   |

## Tables

|          |  |    |
|----------|--|----|
| Table 1  | <i>Demographic Characteristics of All Children Enrolled in Energy Express 2023</i>                   | 13 |
| Table 2  | <i>Demographic Characteristics of Children in the Sample</i>   | 15 |
| Table 3  | <i>Distribution of Benchmark Tests Administered to Energy Express Participants by Grade Level</i>    | 17 |
| Table 4  | <i>Number and Percent of Children who Increased Reading Achievement Composite Scores on DIBELS 8</i> | 17 |
| Table 5  | <i>One-Way Repeated Measures ANOVA of Energy Express by DIBELS Level</i>                             | 18 |
| Table 6  | <i>DIBELS 8 Risk Category Distribution of Energy Express Participants</i>                            | 19 |
| Table 7  | <i>Number and Percentage of Energy Express Students Changing Risk Categories by DIBELS Level</i>     | 19 |
| Table 8  | <i>Effect of Attendance on Risk Category Movement</i>  | 20 |
| Table 9  | <i>One-Way Repeated Measures ANOVA of Comparison Group by DIBELS Level</i>                           | 21 |
| Table 10 | <i>Effect of Energy Express Participation on DIBELS Category Movement</i>                            | 22 |

## Executive Summary

The Energy Express summer reading program has been providing reading services to young rural West Virginia students for 27 years. With the cooperation of the local schools, the West Virginia University Extension Service and funding from numerous agencies, the 6-week program was held in 45 sites across the state. The aim of the program is to prevent the loss of reading skill (*summer slide*) that occurs when K-6 children are home for the summer with little opportunity to read.

The purpose of this quasi-experimental design impact evaluation is to assess the effectiveness of the Energy Express program in stopping the loss of reading skill over the summer. The results of the evaluation will be used to fulfill the requirements of one of their grantors, AmeriCorps, as well as for the purpose of continuous improvement.

This impact evaluation is guided by three research questions developed by the program and aimed at the dual purposes already mentioned. The questions are:

- (1) Do children who fully participate (at least 50% attendance) in Energy Express have significant improvement in reading fluency as measured by age-appropriate, standardized tests?
- (2) Do parents of children who participate in Energy Express perceive that their children read for pleasure more often than they did before the program?
- (3) Do children who fully participate in Energy Express have significantly greater improvement in reading fluency compared to a non-participant comparison group?

Data on reading performance were collected by administering the Dynamic Indicators of Basic Early Literacy Skills, 8th Edition (DIBELS 8) to a sample of 275 Energy Express participants and a selected comparison group of 79 students immediately prior to the end of the

2022-23 school year (pretest) and again just after the beginning of the 2023-24 school year (posttest). A short online survey was developed by program staff and administered to parents via Qualtrics at the end of the program.

By comparing composite reading scores from the posttest with scores from the pretest, it was easy to see that students in the program made apparent progress over the summer. In fact, over 99% exhibited an increase in composite reading score. A repeated measures ANOVA showed that the gains were significant at all grade levels analyzed. Additionally, a logistic regression was conducted and found attendance to be a highly significant predictor of reading achievement for participants.

189 parents completed the parent survey. Their responses were overwhelmingly positive. When asked to rate their child's experience in the 2023 session, 96% chose one of the two most positive choices: Excellent (83%) and Good (13%). Parents also reported their children's independent reading increased from 3.5 days per week before the program to 4.4 days per week afterward.

Investigating the third research question provided an unclear picture of the program's effectiveness. When the same analysis that had been run on the participants to answer the first question was run on the comparison group, the results were the same. Even though they did not attend, the comparison group exhibited significant gains at all levels. Further, when a logistic regression was conducted to see the effect of participation it was found to have no effect on reading achievement.

## **Introduction**

Energy Express is a West Virginia University Extension program with a 27-year history of providing services to school children during the summer break living in rural West Virginia. Energy Express provides these services through funding from various sources. The bulk of this year's funding came from the West Virginia University Extension Service, the West Virginia state legislature, West Virginia University, and from Volunteer West Virginia, the state's commission for National and Community Service. The rest of the funding came from gifts and community foundations. The focus of the program is to promote school success and, to do so, Energy Express historically sets both nutritional and scholastic goals for the program each year. The program attempts to meet nutritional goals by providing the children who participate with a nutritious breakfast and lunch each day. Scholastic goals are addressed through activities that aim to maintain or improve the participants' reading skills over the summer break. Apart from the 2020 program, Energy Express has always been conducted in a face-to-face format lasting five or six weeks and included a nutritional component. The COVID 19 pandemic caused the program to change their design and to offer services online temporarily; however, beginning in the summer of 2021, the program was able to provide the traditional program including face-to-face instruction and a nutritional component once again. Due to a significant loss of funding from a large, competitive AmeriCorps grant, the size of the program was drastically reduced for 2021. This year's program was expanded; however, it is still not back to its pre-pandemic size.

Past evaluations of the program's effectiveness with respect to its scholastic goals have found that Energy Express is successful in helping most participating children to maintain or improve their scores on reading achievement tests. This result is important, given the evidence showing particularly steep learning losses for low-income children because of out-of-school-time

(what has been referred to as the *summer slide*). In addition to goals concerning the children who participate in the program, Energy Express also aims to engage a substantial number of AmeriCorps volunteers who staff the program in this community service effort. The AmeriCorps members are largely made up of college students who work at Energy Express sites either as mentors or community coordinators.

### **Energy Express: The Program and its Goals**

Energy Express 2023 served low-income communities at 45 sites housed in 26 West Virginia counties, with participants ranging from kindergarteners to incoming sixth graders. In the summer of 2023, more than 1400 children attended the program. The Energy Express centers provide programming on differing schedules of either four or five days per week for either five or six total weeks. Initially, the Energy Express program was conceptualized and implemented as a six-week program lasting four hours per day. However, subsequent action of the West Virginia State Board of Education allowing county boards of education the option of establishing calendars with shorter summer breaks presented a problem for the Energy Express program. To combat the effect this change would have on the program, in 2015 Energy Express sought and received approval to give individual sites the option of reducing the program to five weeks with five-hour days rather than six weeks with four-hour days.

The program attempts to meet goals concerning healthy nutrition for the participating children by providing participants with a family-style breakfast and lunch each day they attend. In addition to receiving two nutritious meals per day, the children take part in a literature-based language arts curriculum. This curriculum is implemented by AmeriCorps members who volunteer at the different Energy Express sites each summer. These volunteers complete a three-day statewide site team training regimen before participating in the program. The Energy

Express curriculum focuses on reading, and the volunteers engage the children in various activities, such as drama, writing, and art, all of which are intended to provide participants with multiple opportunities to practice their reading skills. Typically, the volunteers are AmeriCorps members.

### **Evaluation Overview**

Energy Express typically conducts a nonexperimental evaluation of their program designed primarily to determine whether participants either maintain or improve their reading skills over the summer. Along with this typical approach to evaluating their effectiveness, this year the program included an impact component using a quasi-experimental design.

Additionally, the program conducted a parent survey to assess parental perceptions of their children's reading improvement. This three-pronged approach was designed to assist the program in the continuous improvement process as well as meet AmeriCorps requirements.

In their written Evaluation Plan, the Energy Express program identifies their outcome of interest as “change in reading fluency and reading enjoyment in children who participate in Energy Express compared to those who do not participate in Energy Express.” Further, they state in their Theory of Change that:

...low-income, rural Appalachian children who participate in a summer literacy enrichment program will improve their reading skills and increase enjoyment of and confidence in reading by the end of third grade, (thereby) decreasing the achievement gap with their peers. Better reading skills and increased confidence will lead to increased engagement and success in academics so that low-income youth have equal opportunities for post-secondary education and more career choices.

## **Research Questions**

The 2021-2024 external impact evaluation was designed to answer the following three research questions:

- (1) Do children who fully participate (at least 50% attendance) in Energy Express have significant improvement in reading fluency as measured by age-appropriate, standardized tests?
- (2) Do parents of children who participate in Energy Express perceive that their children read for pleasure more often than they did before the program?
- (3) Do children who fully participate in Energy Express have significantly greater improvement in reading fluency compared to a non-participant comparison group?

## **Evaluation Design**

A different approach was used to answer each of the three research questions posed in this evaluation. The first question regarding the improvement in reading skills of participants was addressed with a nonexperimental design. For this component of the evaluation, the assessment results from a sample of the students receiving services were analyzed.

The question concerning parental perceptions of their children's reading progress was assessed by administering an online survey written by Energy Express staff and delivered to parents via Qualtrics.

The third research question was addressed by comparing the performance of the same sample of children used to address the first question with the performance of a comparison group of nonattending children. Cluster sampling was used to select the comparison group. Students from the same schools Energy Express participants attended who were eligible for Energy Express but did not attend formed the pool from which the comparison group was drawn. What



follows is a description of the data collection instruments and procedures used to answer each of the research questions.

### **Data Collection and Analysis**

The Energy Express program used the Dynamic Indicators of Basic Early Literacy Skills, 8<sup>th</sup> Edition (DIBELS 8) to address research questions 1 & 3. A locally designed survey was employed to gather data on question 2. An explanation of each data gathering instrument and the sampling process used with each one follows.

**Reading achievement instrument for research questions 1 & 3.** The Energy Express program used the Dynamic Indicators of Basic Early Literacy Skills, 8<sup>th</sup> Edition (DIBELS 8) to assess student progress. DIBELS 8 is a system developed at the University of Oregon whereby teachers can monitor the progress of their students' reading achievement. DIBELS 8 is a battery of six short fluency measures designed to assess basic skills in reading that can be used for universal screening, benchmark assessment, and progress monitoring in kindergarten through 8<sup>th</sup> grade. The subtests are Letter Naming Fluency (LNF), Phonetic Segmentation Fluency (PSF), Nonsense Word Fluency (NWF), Word Reading Fluency (WRF), Oral Reading Fluency (ORF), and Maze Reading.

- The LNF is an individually administered test given to students in grades K-1 in which students are presented with a page of 100 uppercase and lowercase randomly arranged letters and asked to name as many as they can in one minute.
- The PSF is a one-minute subtest in which students are asked to sound out words into their individual phonemes.
- The NWF subtest (also one minute in length) is one in which students use their phonetic capabilities to pronounce “nonsense” words such as *sut*. On each word,

students are given a score for Correct Letter Sounds (CLS) by making each of the sounds in the word and a score for Words Recoded Correctly (WRC) by reading the whole word correctly. Thus, the subtest yields two scores with one administration to each student.

- The WRF subtest is administered in grades K-3 and is a measure of accuracy and fluency in reading sight words.
- The ORF subtest is administered in grades 1-8. The child is presented with a passage and asked to read it aloud for one minute. The number of correctly read words plus self-corrected words is the final score.
- Maze is a group-administered assessment given in grades 2-8. This three-minute subtest assesses comprehension by presenting the student with a passage with every seventh word converted to a multiple choice with three options.

The University of Oregon has conducted extensive reliability and validity studies on DIBELS 8 with positive results (University of Oregon, 2019). Studies on concurrent alternate form reliability and delayed alternate form reliability were conducted on all subtests. Only delayed alternate form reliability was calculated for the Composite score. The median reliability of PSF in kindergarten was .86 and in first grade was .81. The overall median reliability of PSF was also .81. Both NWF scores (CLS and WRC) were examined for concurrent alternate form reliability. The results in all cases for both types of scores are highly reliable. For NWF-CLS, the median reliability was .89 or above in all grades with an overall median reliability of .91. For NWF-WRC, the median reliability was .88 or above in all grades, and overall median reliability was .90. The WRF subtest had concurrent form reliability coefficients of .94 -.96 at the individual grade levels with an overall reliability coefficient of .95. The concurrent alternate

form reliability for the ORF subtest was also very strong. The median reliability for ORF in all grades was .92 or above. The Maze concurrent alternate form reliability results were not as strong as the other subtests with medians by grade ranging from .66 - .81. The overall median reliability for Maze was .72. The Composite score had stronger delayed alternate form reliability than any individual subtest. The overall median of delayed alternate form reliability for the Composite score was .89 with grade level medians ranging from .80 - .95. The delayed alternate form reliability for the Composite score is sufficiently high that it can be used as a growth measure over time.

To assess validity, DIBELS 8 measures were correlated with end of year administrations of the DIBELS Next Composite, the Total Reading and Word Analysis scores from the Iowa Assessment, and the CTOPP-2 symbolic and non-symbolic composite scores. Predictive validity with the DIBELS Next composite scores, where available, was quite good, except for PSF in first grade, and NWF-CLS and WRC at the beginning of kindergarten. Correlations for PSF ranged from .44 - .65 in kindergarten, but only .10 - .23 in first grade. The correlation for NWF-CLS in the beginning of kindergarten was only .43, but otherwise, NWF-CLS and NWF-WRC correlations were strong across grades and times of year, ranging from .54 - .79.

Several different scores are used in the interpretation of DIBELS 8. *Cut scores* are specific raw scores used to place students in one of four risk categories. *Percentile ranks* by school, district and nationally are provided to compare performance with others. *Zones of growth* use national percentiles to track growth in performance over time and are useful with struggling readers. *Composite scores* combine scores from all subtests to give a more complete picture of a student's performance. The program chose to use tests associated with the grade completed by the student immediately before beginning the Energy Express program. The pretest corresponded

to the Middle year benchmark whereas the posttest was the Ending year benchmark assessment. Because the Composite score provides a broader picture of overall reading achievement and has more robust statistical characteristics than the other subtests, it was used primarily for the analysis of student achievement in this evaluation.

**Parental attitude survey for research question 2.** The program developed an 11-question survey using Qualtrics (See Appendix A). The survey contained Likert scale questions that were designed to ascertain, from the parents' point of view, how well the program was doing. The survey included questions such as "Do you feel Energy Express helped increase your child's literacy?" and "Please rate your child's Energy express experience while they were enrolled in the 2023 summer season." Also included were two questions asking specifically how often participants read for pleasure before and after Energy Express.

### **Sampling Process**

Each of the research questions are answered using a different sampling process. For questions 1 & 3 a power analysis was conducted to determine the needed sample size. Because the program results historically yield a small-to-moderate effect size, 0.2 was used as the effect size for the power analysis. It was determined that 310 observations in both the intervention group and the comparison group were needed to have 80% power to detect a difference between the two groups that is significant at the 0.05 level. To allow for 20% attrition in the comparison group, the program attempted to enroll 388 children ( $388 \times 80\% \text{ retention} = 310$ ) in the study.

**Research Question 1:** This question was addressed by sampling the children enrolled in the 2023 summer program. The full battery of DIBELS 8 was administered to a subset of 513 children scheduled to take part in Energy Express sometime near the end of the 2022-2023 school year (May 12 – June 26). 387 Energy Express participants were assessed with the same

full battery near the beginning of the 2023-2024 school year (July 28 – Sept 19), yielding 323 students with both pre- and posttest scores. The Middle benchmark assessment was administered as a pre-intervention measure to students completing grades K-5 in the spring of 2023, whereas the Ending benchmark assessment was used as a post-intervention measure and administered to the same students in the fall of 2023. Depending on the grade level, the battery consisted of from two to five subtests taking a total of from 2-7 minutes to administer. Records of 275 children in the subset who completed the program (i.e., attended at least 50% of the days in session.) comprise the group of Energy Express participants used in this analysis.

**Research Question 2:** To assess parent perception of children’s reading enjoyment, the program developed a parent survey using Qualtrics. The survey asked about their children’s reading habits and perceived enjoyment during the Energy Express program. During the last week of Energy Express, site supervisors sent an email to each parent with a link to the Qualtrics survey. Additionally, site supervisors sent a printed announcement with a QR code to the survey link home with the children. Their efforts yielded responses from 189 parents and/or guardians of Energy Express participants.

**Research Question 3:** To establish a comparison group, the Energy Express program asked the principal from each school with Energy Express participants to send them a list of seven children who were eligible for Energy Express but not registered. Not every principal responded. The evaluation team then contacted each parent to explain the program and get informed consent for participation in the study. The process garnered the names of 337 students for the comparison group. These 337 students were included in the same pre- and posttest assessment process as outlined for the Energy Express participants in Research Question 1. Of the 337 students recruited for the comparison group, 79 completed both the pre- and posttests.

## Attendance

COVID and the partial loss of grant funding led to a significant decrease in the number of children participating in Energy Express. The trend of decreased program participation has continued. Although children completing grades K-5 are eligible for the program, since 2021 a special emphasis has been put on serving children in grades K-3. A total of 1435 children enrolled in the 2023 program. Of those enrolled, 1032 (72%) of the children attended Energy Express for at least 50% of the days in session. Table 1 lists grade level for the 2023-2024 school year, ethnicity, disability, school lunch eligibility, and gender for all children enrolled in Energy Express 2023.

*Table 1. Demographic Characteristics of All Children Enrolled in Energy Express 2023 (n = 1435).*

| Characteristic                   | Number | Percent |
|----------------------------------|--------|---------|
| <i>2023-24 Grade</i>             |        |         |
| First                            | 277    | 19.3    |
| Second                           | 301    | 21.0    |
| Third                            | 307    | 24.0    |
| Fourth                           | 233    | 16.2    |
| Fifth                            | 196    | 13.7    |
| Sixth                            | 121    | 8.4     |
| <i>Ethnicity</i>                 |        |         |
| White                            | 1265   | 88.2    |
| Afr. American                    | 62     | 4.3     |
| Asian                            | 11     | .8      |
| Hispanic                         | 19     | 1.3     |
| Mixed                            | 71     | 4.9     |
| Other                            | 7      | .5      |
| <i>IEP Status</i>                |        |         |
| Yes                              | 258    | 18.0    |
| No                               | 1177   | 82.0    |
| <i>Lunch Program Eligibility</i> |        |         |
| Free                             | 1334   | 93.0    |
| Reduced                          | 4      | .3      |
| None                             | 97     | 6.8     |

|               |     |      |
|---------------|-----|------|
| <i>Gender</i> |     |      |
| Female        | 728 | 50.7 |
| Male          | 707 | 49.3 |

---

Like previous years, the children attending Energy Express are largely white and from low-income families. The proportion of children receiving special education services is commensurate with national trends. The proportion of children in grades 1-4 (K-3 when recruited for this year’s program.) demonstrates the program’s recent emphasis on early literacy.

### **Evaluation Results**

The Evaluation Plan developed by the program calls for three analyses. First, is a determination of program efficacy by comparing the gains of children who are fully served by Energy Express (at least 50% attendance) with a comparison group of non-attendees. Analyses are to consider school, grade in school, demographic characteristics, and scores on fluency tests before the program to establish baseline equivalence. An ANOVA is to be conducted to determine whether there are significant differences in changes in scores on each fluency test and composite scores overall and by grade. Next, program effectiveness is to be measured by comparing the number of children in each group who move up (less risk of reading failure) or down (greater risk of reading failure) in risk category placement between the beginning and the end of the summer. Finally, the overall effect of attendance on participant achievement is to be investigated by conducting a logistic regression analysis on reading gain data from all participating students using risk category movement as the dependent variable.

A comparison of the stated Evaluation Plan with the Research Questions and the data collected reveals an incomplete alignment. This evaluation will focus on the three Research Questions, incorporating the Evaluation Plan to the extent possible.

**1. Do children who fully participate (at least 50% attendance) in Energy Express have significant improvement in reading fluency as measured by age-appropriate, standardized tests?**

To assess whether the program met its reading achievement goal, a subset of children who fully participated ( $\Rightarrow$  50% attendance) was administered the DIBELS 8. The demographic characteristics for the children belonging to the stratified random sample, who completed the program, and who completed both the pre- and post-tests are reported in Table 2.

Table 2. *Demographic Characteristics of Children in the Sample (n = 275).*

| Characteristic                   | Frequency | Percent |
|----------------------------------|-----------|---------|
| <i>2023-24 Grade</i>             |           |         |
| First                            | 17        | 6.2     |
| Second                           | 67        | 24.4    |
| Third                            | 68        | 24.7    |
| Fourth                           | 52        | 18.9    |
| Fifth                            | 52        | 18.9    |
| Sixth                            | 19        | 6.9     |
| <i>Ethnicity</i>                 |           |         |
| White                            | 236       | 85.8    |
| Afr Amer                         | 8         | 2.9     |
| Mixed                            | 20        | 7.3     |
| Hispanic                         | 8         | 2.9     |
| Other                            | 3         | 1.1     |
| <i>IEP Status</i>                |           |         |
| Yes                              | 58        | 21.1    |
| No                               | 217       | 78.9    |
| <i>Lunch Program Eligibility</i> |           |         |
| Free                             | 262       | 95.3    |
| Reduced                          | 1         | .4      |
| None                             | 12        | 4.3     |
| <i>Gender</i>                    |           |         |
| Female                           | 143       | 52.0    |
| Male                             | 132       | 48.0    |



A comparison of the data for all Energy Express enrollees (see Table 1) and the sample indicates a reasonable degree of demographic similarity between the sample and the entire group. The sample is comprised of slightly larger percentages of students with disabilities, students of color, and students living in poverty (eligible for federal school lunch program). These three demographic characteristics have been shown to suppress achievement scores. If anything, this would cause the analysis to underestimate the achievement of the group.

### **Reading Achievement of Energy Express participants**

In what follows, presented first are descriptive statistics from the Composite score at both pre and post Energy Express, before analyzing the six Composite scores from each DIBELS level using a one-way repeated measures ANOVA (analysis of variance).

DIBELS 8 is designed as a curriculum-based measurement tool for teachers to use for progress monitoring. As such, it provides a limited set of normative statistics. In fact, the only nationally validated scores available for this analysis are percentiles established based on administrations of the various subtests at schools participating in the Assessment Innovation Project (University of Oregon, 2019) and on additional work from the University of Oregon (2022). Because of the informal nature of curriculum-based measurement and because it is used primarily as an instructional aid, the guidelines for administration are more relaxed than with normative tests. The administration manual allows for the use of DIBELS 8 in off-grade progress monitoring. For Energy Express 2023, it appears that most students were assessed using the tests associated with the grade they completed in the spring of 2023, although it is also apparent that the program chose to administer tests off-grade to some students (see Table 3); however, it is impossible to say with certainty because this could be an artifact of grade retention.

Table 3. *Distribution of Benchmark Tests Administered to Energy Express Participants by Grade Level*

| DIBELS Level | Grade Entering Fall of 2023 |    |    |    |    |    | Total |
|--------------|-----------------------------|----|----|----|----|----|-------|
|              | 1                           | 2  | 3  | 4  | 5  | 6  |       |
| K            | 10                          |    |    |    |    |    | 10    |
| 1            | 5                           | 64 | 2  |    |    |    | 71    |
| 2            | 2                           | 3  | 58 | 2  |    |    | 65    |
| 3            |                             |    | 8  | 45 |    |    | 53    |
| 4            |                             |    |    | 5  | 51 | 2  | 58    |
| 5            |                             |    |    |    | 1  | 17 | 18    |
| Total        | 17                          | 67 | 68 | 52 | 52 | 19 | 275   |

It can be said with confidence that most students were assessed using tests for the grade completed in 2023. Because grade levels were not reported for comparison group members, the results of this analysis will be grouped by the DIBELS level (benchmark year), allowing for uniform comparisons throughout the evaluation. Table 4 contains the results of the DIBELS 8 test. Shown here is the number of participants by DIBELS level with improved reading scores.

Table 4. *Number and Percent of Children who Increased Reading Achievement Composite Scores on DIBELS 8.*

| DIBELS Level | N   | Increase |      |
|--------------|-----|----------|------|
|              |     | n        | %    |
| K            | 10  | 10       | 100  |
| 1            | 71  | 71       | 100  |
| 2            | 65  | 65       | 100  |
| 3            | 53  | 52       | 98.1 |
| 4            | 58  | 57       | 98.3 |
| 5            | 18  | 18       | 100  |
| Total        | 275 | 273      | 99.3 |

The performance of children in the DIBELS 8 sample is incredibly positive: 273 of the 275 children (99.3%) increased their reading Composite scores. To check for the significance of the results displayed in Table 4, a one-way repeated measures ANOVA was conducted on each

of the six Composite scores produced by the battery of tests administered to the children. Table 5 displays the resulting Type III Sum of Squares, degrees of freedom, and *F* score for the various levels of DIBELS 8.

Table 5. *One-Way Repeated Measures ANOVA of Energy Express by DIBELS Level*

| DIBELS Level | N   | Type III Sum of Squares | df | <i>F</i>  |
|--------------|-----|-------------------------|----|-----------|
| K            | 10  | 11956.050               | 1  | 46.035*   |
| 1            | 71  | 95888.028               | 1  | 514.028*  |
| 2            | 65  | 74544.377               | 1  | 630.803*  |
| 3            | 53  | 63430.651               | 1  | 328.956*  |
| 4            | 58  | 41307.940               | 1  | 205.055*  |
| 5            | 18  | 24284.028               | 1  | 122.666*  |
| All          | 275 | 307698.329              | 1  | 1635.608* |

Note \*  $p < .001$

At every level, the *F* test indicates a significant ratio between the variance between groups to the variance within the groups ( $p < .001$ ). These findings suggest that the participants made significant gains in Composite reading scores.

Based on their raw scores on the DIBELS 8, students are assigned to risk categories. The risk categories are a way for teachers to focus their instruction and can also be used to track student growth. There are three cut scores, which result in four risk categories: *at risk* for reading difficulties (lowest category), *at some risk* for reading difficulties, *at minimal risk* for reading difficulties, and *at negligible risk* for reading difficulties (highest category). The first two categories represent children who scored below benchmark. Table 6 provides the number and percentage of children scoring at each of the four risk levels for both the pre- and post-test benchmark administrations.

Table 6. *DIBELS 8 Risk Category Distribution of Energy Express Participants*

| Risk Category | Pre-Test |      | Post-Test |      |
|---------------|----------|------|-----------|------|
|               | N        | %    | N         | %    |
| At risk       | 114      | 41.5 | 122       | 44.4 |
| Some          | 43       | 15.6 | 43        | 15.6 |
| Minimal       | 68       | 24.7 | 58        | 21.1 |
| Negligible    | 50       | 18.2 | 52        | 18.9 |

It is notable that even though participants made significant progress on average over the summer, the number of children scoring in the categories indicating below benchmark performance and highest risk for reading difficulties increased while the number in the categories indicating above benchmark performance decreased. Table 7 is a breakdown by test level of the amount of category movement that occurred. Positive numbers indicate movement into categories of less risk and negative numbers indicate moving into categories of greater risk. Amounts are expressed in number of students at each level and the percentage that number represents.

Table 7. *Number and Percentage of Energy Express Students Changing Risk Categories by DIBELS Level*

| DIBELS Level | Number of Risk Categories Gained (+) or Lost (-) |      |       |       |       |      |    |
|--------------|--|------|-------|-------|-------|------|----|
|              | -3   | -2   | -1    | 0     | +1    | +2   | +3 |
| K            | 0  | 1    | 1     | 8     | 0     | 0    | 0  |
|              |  | 10%  | 10%   | 80%   |       |      |    |
| 1            | 0  | 1    | 12    | 51    | 7     | 0    | 0  |
|              |  | 1.4% | 16.9% | 71.8% | 9.9%  |      |    |
| 2            | 0  | 0    | 8     | 49    | 7     | 1    | 0  |
|              |  |      | 12.3% | 75.4% | 10.8% | 1.5% |    |
| 3            | 1  | 0    | 7     | 35    | 7     | 3    | 0  |
|              | 1.9%   |      | 13.2% | 66.0% | 13.2% | 5.7% |    |
| 4            | 0  | 2    | 11    | 39    | 4     | 2    | 0  |
|              |  | 3.4% | 19%   | 67.2% | 6.9%  | 3.4% |    |
| 5            | 0  | 1    | 2     | 13    | 1     | 1    | 0  |
|              |  | 5.6% | 11.1% | 72.2% | 5.6%  | 5.6% |    |
| Total        | 1  | 5    | 41    | 195   | 26    | 7    | 0  |
|              | .4%  | 1.8% | 14.9% | 70.9% | 9.5%  | 2.5% |    |

Sixty percent of all children stayed within the same risk category from beginning to end of the program. Slightly over 12% of the children gained either 1 or 2 categories while 17.1% moved down from 1-3 categories.

Although not addressed in the research questions, the Evaluation Plan calls for an analysis of the effect of attendance on risk category movement. To better understand the relationship between attendance and achievement a Logistic Regression was conducted using risk category movement as the dependent variable and days of attendance (*Days*) as a covariate. Table 8 shows the results of the regression.

Table 8. *Effect of Attendance on Risk Category Movement*

|          | B      | S.E.  | Wald   | df | Sig.  | Exp(B) |
|----------|--------|-------|--------|----|-------|--------|
| Days     | .181   | .058  | 9.606  | 1  | .002  | 1.198  |
| Constant | -6.006 | 1.357 | 19.593 | 1  | <.001 | .002   |

Used as a covariate, Days of attendance is a significant ( $p < .01$ ) predictor of a child's performance on DIBELS 8 when it comes to risk category movement. Further, the odds ratio (Exp B) is greater than 1, which tells us that as the number of days in attendance increases so do the odds that a student will move up a risk category.

**2. Do parents of children who participate in Energy Express perceive that their children read for pleasure more often than they did before the program?**

The second question of interest is whether parents believe Energy Express participation increases a child's interest in reading. To answer this question the program surveyed 189 parents and/or guardians of Energy Express participants. On the survey parents were asked how many days per week their children were interested in reading before and after participation. The report states that children showed interest in reading by either reading independently or bringing a book to an adult to be read to 3.5 days per week before the program and 4.4 days per week afterward.

Parents were also asked three questions to gauge their overall satisfaction with the program. When asked to rate their child’s experience in the 2023 session, 83% chose *Excellent*, 13% chose *Good*, 3% indicated *Poor* and 0.5% said their child had a *Terrible* experience. Asked if Energy Express helped increase their child’s literacy, 88% of the parents responded positively by selecting either the *Definitely Yes* (64%) or *Probably Yes* (24%) choices on the survey. Finally, they were asked if they would enroll their child next year if eligible. Nearly 94% responded positively with either a *Definitely* (87.3%) or a *Probably* (6.6%).

**3. Do children who fully participate in Energy Express have significantly greater improvement in reading fluency compared to a non-participant comparison group?**

Before comparing the Energy Express participant performance to that of the comparison group, an analysis of the Comparison group’s performance on the DIBELS 8 like that of the Energy Express group was conducted. The results of the analysis were like those of the Energy Express analysis. The comparison group members made significant progress at every level of DIBELS administered (see Table 9).

Table 9. *One-Way Repeated Measures ANOVA of Comparison Group by DIBELS Level*

| DIBELS Level | N  | Type III Sum of Squares | df | F        |
|--------------|----|-------------------------|----|----------|
| 1            | 32 | 86736.125               | 1  | 335.102* |
| 2            | 14 | 41257.143               | 1  | 76.003*  |
| 3            | 14 | 43792.071               | 1  | 212.509* |
| 4            | 10 | 7617.600                | 1  | 62.417*  |
| 5            | 9  | 21218.778               | 1  | 224.471* |
| All          | 79 | 97354.962               | 1  | 594.975* |

Note: \*  $p < .001$

As was the case with the Energy Express participants, the nonparticipants showed significant gains in DIBELS 8 reading scores over the summer. For each level assessed and overall, the  $F$

value was significant ( $p < .001$ ). To further assess the value of the Energy Express program, the performance of the participants was compared directly to that of the nonattending comparison group. The analysis was conducted using Logistic Regression with upward movement in risk category as the dependent variable. The results of the regression can be found in Table 10.

Table 10. *Effect of Energy Express Participation on DIBELS Category Movement*

|          | B      | S.E. | Wald   | df | Sig.  | Exp(B) |
|----------|--------|------|--------|----|-------|--------|
| Group    | -.457  | .348 | 1.723  | 1  | .189  | .633   |
| Constant | -1.535 | .295 | 27.153 | 1  | <.001 | .215   |

The results in Table 10 tell us that group membership had no effect on Risk Category movement. In other words, children attending Energy Express did no better than those who did not attend when it comes to their “at risk” rating for reading failure.

### **Discussion and Recommendations**

The Energy Express summer program brings together children from low-income communities and AmeriCorps members (made up predominantly of college students), and the organizers expect that all involved will show a positive effect from the experience. Since 2019 the program has attempted to take a quasi-experimental approach to the evaluation of its effectiveness with respect to its goals concerning reading achievement. To that end, they aim to select a randomized sample of children to assess pre- and post-program with an instrument capable of accurately measuring reading growth. The comparison group component is designed to demonstrate whether the program has the desired effect of stopping the summer slide and promoting reading growth over the summer. The program submitted a written Evaluation Plan along with its grant. The goals set forth in the Evaluation Plan and the research questions are similar, but not identical.

Program organizers established three research questions focused on student outcomes for the grant cycle that included the 2023 Energy Express program. The first question asks to what extent children who participate in Energy Express maintain or improve their reading achievement over the summer. Similarly, the Evaluation Plan asks what effect Energy Express attendance has on reading achievement as measured by advancement in risk categories. The second question focuses on parent perception of their children's attitude toward reading. The Evaluation Plan does not have a parent component. The third question asked whether children participating in Energy Express have significantly greater improvement in reading fluency over the summer than children who do not participate. The Evaluation Plan asks a similar question, but it goes a step further by identifying risk category movement as the dependent variable. Access to a comparison group provided the possibility of a comparison study for 2023. However, no demographic data were collected for the comparison group, making it impossible to fulfill the Evaluation Plan, which called for using demographic characteristics as covariates in the analysis. In what follows, the outcomes will be discussed in relation to the research questions established by the program.

The first research question asks about the extent of improvement in reading fluency. The analysis conducted here considers this question in two ways. First by analyzing the pre- to posttest gain on the Composite score then by upward movement in risk category placement. The number of students increasing Composite scores from the pre- to post-testing was calculated. The results demonstrate straightforward evidence that students overwhelmingly benefitted from the program. 99.3% of children assessed with DIBELS 8 improved their Composite scores. Additionally, it was discovered that at every DIBELS level these increases were significant. Results obtained from a one-way repeated measures ANOVA indicate that increases at each



DIBELS level K-5 were highly significant ( $p < .001$ ). These findings are even more significant when consideration is given to the typical backslide that happens over the summer.

However, not all the reading achievement findings were equally positive. Another way progress is charted on DIBELS is through risk category assignment. Raw scores on the DIBELS 8 are used to assign children to risk categories. The percentage of students scoring in the two categories indicating greatest risk for reading failure increased from the pretest (57.1%) to the posttest (60%) while the percentage of students in the categories with least risk decreased. Tracking the progress of students as they moved between categories was also less positive. Only 12 % of the students moved to a higher category while 17.1% moved downward. These disparate findings suggest that although the children improved their reading scores from pre- to post-test, they did not necessarily improve their relative standing when compared to national standards. This is also likely at least in part the result of using statistics based on average scores for the ANOVA and using categorical data for the risk assignment. If this is viewed from the criterion of maintaining or improving reading achievement, then 82.9 % of participants either maintained (70.9%) or improved (12%) their reading risk category status. These results are more in line with past years' performance than the results obtained when using the Composite score as the improvement measure.

The Evaluation Plan written into the grant also sought to determine achievement gains of Energy Express participants; however, it asked specifically what effect attendance had on risk category movement. A logistic regression was performed on the data using days of attendance as a covariate, which resulted in discovering a highly significant, positive effect of attendance on risk category movement. The more days a child attended the program, the more likely they were to experience less risk of reading failure and move up a reading risk level.

The second question of interest is whether parents believe Energy Express participation increases a child's interest in reading. Results from the survey used to answer this question leave no doubt as to the affection the parents have for the Energy Express program. The direct answer to this question is found in the response to the question asking how many days per week their children were interested in reading before and after participation. In response parents said on average their children either read independently or sought out an adult to be read to 3.5 days per week before the program and 4.4 days per week afterward. These results suggest a clear increase and a positive step toward improved literacy. Additionally, parents were highly positive in their responses to questions regarding satisfaction with the program.

The Evaluation Plan set a target of 14% for the response rate for this survey. Because the program served multiple children from the same family, and because some families have only one parent it is impossible to calculate the total possible respondents. Thus, an accurate response rate is also impossible to calculate.

The third research question involves sampling and assessing non-participants. For the first time since 2019 the program was able to recruit non-participants and establish a comparison group. Data from the comparison group was first analyzed to see whether the students experienced a "summer slide" in reading achievement. The same analysis using a one-way repeated measures ANOVA that was used on the Energy Express group was conducted. Similarly, it was found that the comparison group did not experience the loss of reading achievement expected. In fact, the comparison group demonstrated statistically the same gains as the Energy Express group. This finding calls into question the success of the Energy Express program.

To assess whether Energy Express participants experienced less of a summer slide than students who did not attend, a logistic regression analysis was conducted. Per the research question, upward movement in risk category assignment was the outcome of interest. Demographic data were not available for the comparison group, leaving group membership as the only independent variable in the model. The model proved to be nonsignificant when predicting risk category movement. In other words, Energy Express participants performed no differently than nonparticipants in terms of reading achievement.

The results of this evaluation are puzzling. When looking at just the Energy Express group, the gains in reading are impressive. The impressiveness of the reading score gains is diminished when it is seen that the comparison group also made gains. Unlike the comparison study done in 2019, the Energy Express children did not outperform those who did not participate. Furthermore, both groups demonstrated the same significant gains in composite reading scores over the summer. Neither group had enough members to meet the recommended sample size for this comparison, bringing into question the validity of the findings.

### **Recommendations**

Energy Express 2023 proved to be both successful and unsuccessful in terms of reaching its goals. Parents have an incredibly positive view of the program and feel that their children's reading improves because of attending the program. The participants also made noticeable achievement gains across all grade levels; however, they did not outperform nonparticipants. Below are several areas the program should improve as they look to the future.

- 1) Sampling Procedures. Care was taken this year to recruit a comparison group. It would be beneficial to the analysis if demographic data were included.

Socioeconomic status, special education participation, and ethnicity have been shown

to impact student achievement and can function as confounding variables. Knowing this information makes it possible to identify its potential effect.

- 2) Group size. The program calculated that 310 observations were needed in each of the groups to have 80% power to detect a difference in reading achievement between the two groups significant at the  $p < .05$  level. Neither group met the target. It is recommended that the program work on finding ways to reach their target sample size to make their findings more generalizable.
- 3) Assessment Tool. The findings in the comparison study are counterintuitive. The five levels examined showed no benefit for the children who attended Energy Express. These results run counter to the results of the comparison study done in 2019. DIBELS 8 is designed for use by classroom teachers to aid in instructional design. As such, the instrument may not be sensitive enough to use for the purpose of evaluating the program. A close review of DIBELS 8 relative to its appropriateness for this task should be conducted.

In summary, Energy Express was successful again this year in providing the disadvantaged youth of West Virginia with high-quality summer programming that helped children make significant gains in their reading levels over the summer. It is recommended that they continue providing such a program.

## References

Field, A. (2005). *Discovering statistics using SPSS* (2<sup>nd</sup> ed.). Thousand Oaks, CA: Sage Publications.

Kirk, R. (1999). *Statistics: an introduction* (4<sup>th</sup> ed.). Harcourt Brace: New York.

University of Oregon (2019). 8th Edition of Dynamic Indicators of Basic Early Literacy Skills (DIBELS®): Technical Manual. Eugene, OR: University of Oregon. Available: <https://dibels.uoregon.edu>

University of Oregon (2022). DIBELS 8<sup>th</sup> Edition 2021-2022 Percentiles (Technical Report 2201). Eugene, OR: University of Oregon. Available: <https://dibels.uoregon.edu>



## Default Question Block

We hope your child had a fun, engaging, and meaningful experience at Energy Express this summer. We are always trying to improve upon our offerings and we value your opinion. As the parent or guardian of a child that was enrolled in Energy Express this summer, we are inviting you you to fill out this quick survey. It should take about 3–5 minutes to complete. **Your responses are anonymous** and will not impact your children's participation in future Energy Express programs

Thank you for helping us improve this valuable program!  
–The Energy Express Team

How many years has your child participated in the Energy Express program? (If this is the first year, just put a 1)

Please rate your child's Energy express experience while they were enrolled in the 2023 summer season:

- Excellent
- Good
- Average
- Poor
- Terrible

**How many days of the week** was your **child interested** (see below for definition) **in reading PRIOR TO** this Energy Express season?

Interested is defined as either:

1. Reading independently; or
2. Bringing a book to an adult to be read to.

- 0 days
- 1 day
- 2 days
- 3 days
- 4 days
- 5 days
- 6 days
- 7 days

**Based on your observation, how many days of the week is your **child interested** (see below for definition) in **reading NOW?****

Interested is defined as either:

1. Reading independently; or
2. Bringing a book to an adult to be read to.

- 0 days
- 1 days
- 2 days
- 3 days
- 4 days
- 5 days
- 6 days
- 7 days

Do you feel Energy express helped increase your child's literacy during the 2023 season?

- Definitely yes
- Probably yes
- Might or might not
- Probably not
- Definitely not



Please rate the benefits of the 2023 Energy Express season in order of importance with **one being most important and 7 being the least important.**

Simply drag your response in the order of your choosing.

STEM activities

Literacy assistance

Crafts for child to do

Access to healthy snacks and meals

Positive Relationship with Mentor

Activities to help me engage with my child

Other

If your child is eligible, will you enroll your child in Energy Express next year?

Definitely yes

- Probably yes
- Might or might not
- Probably not
- Definitely not

Did you notice any other changes in your child as a result of participating in Energy Express?

Do you have any other comments or suggestions that you would like to share with the Energy Express team?

STEMCARE provided science activities for all Energy Express participants. Which, if any, activities did your child complete? (choose all that apply)

- Air Straw Rocket (week 1)

- Code the Class, picture cryptography (week 2)
- Enemy Pie Fractions Game (week 3)
- Engineer a Bird Beak (week 4)
- Lifting with Levers (week 5)
- Coder Says (week 6)
- I am not sure

What did your child like best about the science activities?

In which county does your child attend school?

- Barbour
- Berkeley
- Boone
- Braxton
- Brooke
- Cabell
- Calhoun
- Clay
- Doddridge
- Fayette

## What is your relationship to the child?

- Parent
- Guardian such as foster parent
- Grandparent
- Other relative such as aunt, uncle, or sibling
- Other

For this next question, **please note that we are not asking you to pay for Energy Express. It is completely free.**

*For us to better communicate the value, please state how much you would be willing to pay for the Energy Express experience for your child per week. Please enter the amount in the text box below.*

Per week

Which of the following best describes your child's race and ethnicity? (select all that apply)

- American Indian or Alaska Native
- Asian
- Black or African American

- Hispanic or Latino
- Native Hawaiian or Other Pacific Islander
- White or Caucasian
- Prefer not to answer

Powered by Qualtrics