

## NU Data: Building Educators' Data Use in Schools

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**Abstract:** *NU Data prepares educators to use data effectively with their students. A brief rationale for research is provided together with preliminary data from Years 1 and 2 describing impact on educator attitudes about skills in data-based problem solving, and student success in achieving educator set goals for learning or behavior.*

**Keywords:** *Data-based problem solving, educator training, data use*

The Nebraska University (NU) Data project (Doll, Horn, & Shope, 2010) is a five month professional development program designed to strengthen educator's capacities to use student data to refine instructional modifications for underperforming students. Data-based decision-making teams have been highly effective in promoting the academic and behavioral success of students (Burns & Symington, 2002; Erchul & Martens, 2002; Gutkin & Curtis, 2009; Martens & DiGennaro, 2008). However, school teams struggle to implement high quality problem solving procedures with good fidelity (Burns & Symington, 2002; Noell, Duhon, Gatti, & Connell, 2002). They have difficulty with collecting and managing student data, using data to drive educational planning, and implementing interventions reliably (Burns & Symington, 2002; Doll, Haack, Kosse, Osterloh, Siemers, & Pray, 2005; Telzrow, McNamara, & Hollinger, 2000). Additionally, teams struggle to determine whether the interventions that they use meet rigorous standards for empirical support and effectiveness.

The *NU Data* program addresses these concerns by targeting six pragmatic data-use skills that were identified as barriers by educators (Doll et al., 2005): (1) knowing a variety of ways to collect data; (2) selecting protocols that are best suited to answer teams' questions about students; (3) collating and graphing data; (4) discerning trends and differences in data; (5) using data and data trends in team problem solving; and (6) selecting evidence-based interventions to use in response to data. The program blends distance strategies with coaching and guided practice to strengthen educators' data use skills.

This paper describes a study examining the feasibility and the likely impact of the NU Data program. Impact was assessed for educators' *skills* in the use of data, their *knowledge* about the use of student data, and their *beliefs* about using data effectively in their schools. Student impact was assessed by examining their success in accomplishing the goals that NU Data educators had set for them. Results are described for Year 1 and Year 2 of the 3-year intervention study.

## METHOD

### PARTICIPANTS

Each year, five 3- or 4-member school district teams participated in the study for a total of 10 teams and 31 educators (25 female, 6 male). Educators participating in Years 1 and 2 included: general and special education educators, resource and support educators, school counselors and psychologists, speech language pathologists, and administrators. Their educational experience ranged from beginning educators to educators working in schools over 20 years. Each team selected six students with whom to practice their data-based problem solving skills for a total of 60 students. Students ranged from kindergarten to seniors in high school and varied in educational and behavioral goals.

### MEASURES

The *NU Data Knowledge Scale* is a 30-item multiple-choice instrument developed as part of this study to assess educators' knowledge of the six pragmatics data-use skills. Pilot data for this measure suggests that it has acceptable internal consistency ( $\alpha = .763$ ) and shows evidence of being a single factor construct (i.e., data literacy;  $\chi^2 = 1231.474$ ,  $df = 435$ ,  $p < .0001$ ; CFI = .971, TLI = .968, RMSEA = .019).

The *Goal Attainment Scale* (Kiresuk, Smith, & Cardillo, 1994) was used to rate students' success in reaching the goals that educators had set for their students. The scale ranged from -2 (indicating that the student's situation was much worse at the end of the case) to +2 (indicating that a team's goal for a student was fully met). Goal attainment scales for each student were independently coded by two research assistants who were blind to the identity of the students and teams. The interclass correlation between raters was .71.

The *Student Assistance Team Attitude Survey* (SATAS; Yetter & Doll, 2007) measures educators' ratings of the acceptability and perceived effectiveness of data-based problem solving. The SATAS items' wording was modified to refer to the data-based problem solving of single educators instead of Student Assistance Teams. The final version consists of 29 items that are scored on a 6-point Likert scale with higher scores indicative of more positive beliefs about the acceptability and likely impact of data-based problem solving. Prior research showed that the scale demonstrated strong internal consistency ( $\alpha = .95$ ). Item wording was modified to refer to data-based problem solving instead of Student Assistance Teams.

The *NU Data Use Rubric* is a 17-item instrument that was developed as part of this study to evaluate educators' adherence to the NU Data logic model with scores ranging from 0 (e.g., the criteria was not observed or completed) to 2 (e.g., the criteria was observed or completed). Three research assistants and two independent coders who were blind to the study independently coded each case using the rubric. Coding by the three research assistants was combined to a single NU Data use rubric score. Intraclass correlation coefficients (ICC) were computed to describe the absolute agreement between NU Data composite and two independent coders' inter-rater agreement for each component of the rubric. The absolute reliability of the ICC scores for the NU Data composite score and two independent raters was .813.

### PROCEDURES

Educators practiced the NU Data strategies with six students while participating in: (a) weekly online coaching meetings with NU Data research staff; (b) face-to-face meetings with NU Data staff at the educators' home schools; and (c) two-day seminars (fall, winter, & spring) with NU Data research staff and the other participating teams. Each educator provided the NU

Data staff with an example of their use of data-based problem solving from the year before (*pre NU Data* cases). Six months after completing NU Data, each educator provided an example of their use of data the year after (*post NU Data* case). The Knowledge Scale and SATAS measures were collected from participants at three time points (i.e., Seminars One, Two, and Three) during Years 1 and 2. The NU Data Use Rubric and Goal Attainment Scale measures were computed at the end of Year 1 and Year 2 to assess the quality of data-based problem solving and student progress towards educator set goals.

**ANALYSES**

A series of generalized linear mixed models were used to examine the degree to which participation in NU Data predicted educators’ NU Data Knowledge Scale scores, SATAS scores, and NU Data Use Rubric scores. Additionally a generalized linear mixed model was used to examine how well the NU Data Use Rubric Scores predicted Goal Attainment Scale Scores. The analyses are reported as fixed effects to describe changes in student scores at nonrandom time points throughout the study.

**RESULTS**

Results below describe evidence of NU Data’s impact on the data use skills of educators and the outcomes for the students that they served during Year 1 and Year 2. The first analyses (see Table 1) used the NU Data Knowledge Scale to examine the degree to which participation in NU Data strengthened educators’ knowledge of data-based problem-solving. When controlling for implementation fidelity, results from the fixed effects analyses indicate there was a significant linear effect of time on knowledge of data-based problem solving. As such, it is estimated that participants are 1.384 times more likely to provide a correct answer to knowledge scale items with each additional seminar they attend (95% CI: 1.182 ≤ OR ≤ 1.620).

Table 1. *Model-estimated Fixed Effects for the NU Data Knowledge Scale*

Effect	$\beta$	$SE\beta$	$p$
Intercept	-0.628	0.475	.196
Seminar	0.325	0.080	< .001
Participation	1.925	0.512	.001

The second analyses (see Table 2) used the SATAS examine how participation in the NU Data project strengthened educators’ attitudes and perceived effectiveness towards data based decision making. Results from the fixed effects analyses suggest that educators’ attitudes and perceived effectiveness towards data use became more positive as participation in the NU Data program increased. There was a significant linear effect of seminar on the SATAS total score ( $p < .001$ ). As such, the SATAS total score is expected to increase by .144 units ( $f^2 = .494$ ) for each additional seminar attended.

Table 2. *Model-Estimated Fixed Effects for the Student Assistance Team Attitude Survey*

Effect	$\beta$	$SE\beta$	$p$
Intercept	4.930	0.065	< .001
Seminar	0.144	0.025	< .001

The third set of analyses used the NU Data Use Rubric to examine how participation in NU Data strengthened educators’ adherence to the six pragmatics and data-based decision-

making (see Table 3). Results showed that participants' *during NU Data* cases were significantly higher than their *pre NU Data* cases  $F(2, 8) = 10.17, p < .006, f^2 = .949$ . Participants' *post NU Data* cases were significantly higher than their *pre NU Data* cases (Estimate = 1.024,  $SE = 0.228, p = 0.002$ ). There was no significant difference between *during NU Data* cases and *post NU Data* cases (Estimate = -0.462,  $SE = 0.228, p = 0.007$ ).

Table 3. Model-Estimated Fixed Effects for the NU Data Use Rubric

Effect	$\beta$	$SE\beta$	$p$
Intercept	1.460	0.135	< .001
Case <sup>a</sup>			
Pre	-1.024	0.228	.002
During	0.000	---	---
Post	-0.462	0.228	.077
Cohort	0.565	0.096	<.001

Note. (a)  $F(2, 8) = 10.17, p = .006$ . 'During' is the reference group for Case.

The fourth analyses used the Goal Attainment Scales to examine how the data-based decision-making provided by NU Data related to student success in reaching educator-set goals (see table 4). Estimated fixed effects were calculated from the Goal Attainment Score (GAS). Students who were monitored by participants in the NU Data program were significantly more likely to have made positive progress than negative progress ( $p = 0.002$ ). Additionally, students were 5.782 times more likely to have made positive progress (+1 or +2 GAS score) at the end of the program year than have made negative or no progress (-2, -1, 0 score; 95% CI:  $2.254 \leq OR \leq 14.833$ ).

Table 4. Estimated Fixed Effects for the Goal Attainment Scale Scores

GAS	Observed Frequencies Probabilities	Model-Predicted Probabilities
-2	1 (.018)	---
-1	1 (.018)	---
0	8 (.145)	.148 <sup>a</sup>
1	17 (.309)	.343
2	28 (.509)	.509

Note. <sup>a</sup>.148 is the model-predicted probability of GAS  $\leq 0$ .

## DISCUSSION

Preliminary results from Years 1 and 2 suggest that educators may benefit from the program in the following ways: (1) increased knowledge of NU Data's six data pragmatic data-use skills; (2) improved attitudes towards the acceptability and perceived effectiveness of data-use and implementation; (3) increased competence in data-use to address student problems; and (4) improved student progress towards educator-selected goals. These preliminary results highlight the promise of the NU Data intervention in empowering educators' data use skills and strengthening students' academic and behavioral success.

However, there are some limitations in this study. The primary purpose of this study is to refine the NU Data intervention and describe its promise as an intervention to strengthen educators' data-based problem solving skills. A limitation is that the study did not use a control group design because its purpose was the development of a professional development

curriculum. Thus, it would be premature to use these results as evidence of the intervention's effectiveness. Additionally, this paper discusses only the quantitative data from Year 1 and Year 2 of a 3-year mixed methods study. As such, a second limitation of these preliminary results is that analyses describing educator progress and experiences have not been integrated into the interpretation. Future studies are needed that will use a control group design to evaluate the effectiveness and feasibility of the NU Data program with additional educators.

## REFERENCES

- Burns, M. K., & Symington, T. (2002). A meta-analysis of prereferral intervention teams: Student and systemic outcomes. *Journal of School Psychology, 40*, 437-447.
- Doll, B., Haack, K., Kosse, S., Osterloh, M., Siemers, E., & Pray, B. (2005). The dilemma of pragmatics: Why schools don't use quality team consultation practices. *Journal of Educational and Psychological Consultation, 16*(3), 127-155.  
doi:10.1207/s1532768xjepc1603\_1
- Doll, B., Horn, C., & Shope, R. (2010). Grant entitled NU Data: Using Data to Foster the School Success of Students with Disabilities to the U. S. Department of Education, Institute for Educational Science.
- Erchul, W. P., & Martens, B. K. (2002). *School consultation: Conceptual and empirical bases of practice (2<sup>nd</sup> ed)*. New York: Plenum.
- Gutkin, T. B., & Curtis, M. J. (2009). School-based consultation: The science and practice of indirect service delivery. *The handbook of school psychology, 4*, 591-635.
- Kiresuk, T. J., Smith, A. E., & Cardillo, J. E. (1994). *Goal attainment scaling: Applications, theory, and measurement*. New Jersey: Lawrence Erlbaum Associates, Inc.
- Martens, B. K., & DiGennaro, F. D. (2008). Behavioral consultation. In W. P. Erchul, & S. M. Sheridan (Eds.). *Handbook of research in school consultation: Empirical foundations for the field* (pp. 147-170). New York: Routledge.
- Noell, G. H., Duhon, G. J., Gatti, S. L., & Connell, J. E. (2002). Consultation, follow-up, and behavior management intervention implementation in general education. *School Psychology Review, 31*, 217-234.
- Telzrow, C. F., McNamara, K., & Hollinger, C. L. (2000). Fidelity of problem solving implementation and relationship to student performance. *School Psychology Review, 29*, 443-461.
- Yetter, G., & Doll, B. (2007). The impact of logistical resources on prereferral team acceptability. *School Psychology Quarterly, 22*, 340-357.