

The Effects of a Response Card Intervention on the Active Participation in Math Lessons of Five Seventh Graders With Learning Disabilities

Nicole Müllerke
Special School Geisbach, Hennef, Germany

Ellen L. Duchaine
Texas State University, United States of America

Matthias Grünke & Jennifer Karnes
University of Cologne, Germany

In this single-case study, we examined the impact of a simple response card intervention on student engagement during math lessons. An ABA reversal across-subjects design was used to establish a causal relationship between the treatment and the expected outcome. Five adolescents with learning disabilities from a seventh-grade classroom were observed during hand-raising and response-card conditions to determine the effects of response cards on student responding and test scores. Results indicated that the intervention increased both participation and performance. The paper ends with a critical discussion of the results and future research challenges.

Keywords: **Student Participation, Learning Disabilities, Response Cards, Math Instruction, Single-Case Research**

Introduction

Instruction is defined as the process of transmitting skills and/or knowledge in such a way that students learn. In today's classrooms, this means integrating grade-level standards throughout the curriculum, teaching, and assessment (Engelmann & Carnine, 2016). Academic learning is a cognitive event. It is an interactive process that requires teachers not only to share information with students but also to ensure that they have grasped the knowledge (Parsons, Nuland, & Parsons, 2014). Because teaching and learning are interactive, instruction must include active engagement not only from the teacher, but also from the students (Brophy & Good, 1986). That is, teachers share information and students are expected to respond, including practicing. Complicating matters is the fact that all students do not enter a lesson with the same base of knowledge. Thus, educators are required to create lessons using evidence-based instructional practices to teach students at various achievement levels within the same class-

Insights into Learning Disabilities is published by Learning Disabilities Worldwide (LDW). For further information about learning disabilities, LDW's many other publications and membership, please visit our website: www.ldworldwide.org.

room (Parsons et al., 2014). Skillfully designed lessons are critical in meeting the needs of students in classrooms worldwide.

Interactive Direct Instruction (Engelmann, 2017) is a scientific approach to teaching that enables educators to be more effective and efficient in conveying skills and knowledge to students across grade levels. Direct Instruction is often mistaken for teacher-based lecture accompanied by little student interaction. In reality, Direct Instruction means providing a concrete introduction of information followed by ongoing brisk-paced practice that receives immediate feedback (Watkins & Slocum, 2004). This almost errorless learning approach sets students up for success as they interact with new information until they reach mastery (Brophy & Good, 1986; Engelmann & Carmin, 2016; Watkins & Slocum, 2004).

The key goal of Direct Instruction is to provide students with the correct skill and/or content and then immediately involve them in the cognitive process of understanding and remembering. This, in turn, requires repetitive active participation followed by teacher confirmation of correct responses and/or corrective feedback to make learning as seamless as possible. During both whole-class and small-group instruction, students interact with the content by having multiple opportunities to respond (OtR) together, known as unison responding.

Research supports the use of various methods of unison responding, whereby all students respond to questions or prompts, simultaneously allowing them to practice and the teacher to assess their understanding before going on to the next learning target (MacSuga-Gage & Simonsen, 2015; Menzies, Lane, Oakes & Ennis, 2017; Twyman & Heward, 2018).

Choral responding and response cards are two well-researched methods of using unison responding to increase opportunities for students to respond. Both methods are evidence-based and support active participation and achievement, as well as high levels of time on task (Haydon, Marsicano, & Scott, 2013; Owiny, Spriggs, Sartini, & Mills, 2018).

In choral responding, students verbally answer the teacher's questions together when prompted. This approach is commonly applied across grade levels and content areas whether using scripted or unscripted Direct Instruction. When using response cards, students visually answer the teacher's questions together when prompted. That is, students present a response to the teacher using write-on or preprinted cards.

The format of response cards is almost limitless. Cards may be small white boards that allow students to use erasable markers to write their answers on before holding them up, or they may be preprinted cards with various options for choosing predetermined responses such as true/false, fact/opinion, multiple choice (A, B, C, D), numbers, math symbols, and so forth (Duchaine, Green, & Jolivette, 2011; Owiny et al., 2018). The various formats provide a great deal of flexibility for students to participate. In short, response cards are an "easy-to-use teaching tactic derived from applied behavior analysis" (Twyman & Heward, 2018, p. 78), as repeatedly demonstrated in the literature across types of students, subjects, and grade levels. For example, the research supports using response cards for students with and without special education needs in inclusive classrooms (Duchaine, Jolivette, Fredrick & Alberto, 2018; Haydon, Richmond Mancil, & Van Loan, 2009; Narayan, Heward, Gardner, Courson, & Omness, 1990) and in both special classrooms and special schools for students with disabilities (Blood, 2010; Bondy & Tincani, 2018; Christle & Schuster, 2003; Davis & O'Neill, 2004; George, 2010). In addition, response cards have been found to be effective at both the elementary (Bondy & Tincani, 2018; Christle & Schuster, 2003) and the secondary level (Adamson & Lewis 2017; Blood, 2010; Duchaine et al., 2018; George, 2010). The flexibility of response cards is demonstrated by their use in math (Adamson & Lewis, 2017; Christle & Schuster, 2003; Duchaine et al., 2018), science (Duchaine et al., 2018), social studies (Blood, 2010; George, 2010), and writing (Davis & O'Neil, 2004).

Purpose of the Present Study

The purpose of the present study was to replicate the Christle and Schuster's (2003) research on the use of response cards as a means of unison responding during Direct (math) Instruction. Specifically, we implemented response cards during math lessons using an ABA reversal across-subjects design to investigate the effect on student participation, specifically the number of student responses to teacher questions and performance on weekly quizzes. The teacher taught math in accordance with Direct Instruction principles and added response cards as an intervention.

Method

Participants and Setting

The study took place in a seventh-grade classroom of a rural school for students with special learning needs on the outskirts of a large metropolitan area in Western Germany. The main teacher selected the participants based on her observations of how intensively they had engaged in math lessons over past weeks, as measured by how frequently they raised their hands to respond in class. She identified five students (three males and two females) whom she deemed to be extraordinarily passive during math lessons as the target group.

Three of the students had a migrant background; one had only lived in Germany for a little over two years. All participants had been diagnosed with a learning disability (LD) by a multi-professional team. The diagnoses were based on a conception of LD aligned with the criteria outlined by Grünke and Morrison Cavendish (2016), who describe students with LD as those who "fail to develop the knowledge, skill, will, and self-regulation necessary to succeed in key subject areas" (p. 1), thus, including students with an IQ below average. In our case, intelligence level was measured using the Kaufman Assessment Battery for Children (KABC-II; Kaufman & Kaufman, 2004). The level of math proficiency was determined by scores on a standardized test (Moser Opitz et al., 2010).

All participants attended the same class in the aforementioned school. According to their teacher, their inactivity during math lessons was not due to a lack of language comprehension. Table 1 gives an overview over important participant characteristics.

Table 1. ***Demographic Characteristics of the Participants***

Name	Gender	Age	IQ	In Germany	Math Competence	Ethnicity
Student 1	male	12	74	for 2;5 years	class 5	Mongolian
Student 2	male	15	49	for 4;8 years	class 1	Serbian
Student 3	male	13	56	since birth	class 4	Russian
Student 4	female	13	56	since birth	class 2	German
Student 5	female	14	60	since birth	class 1	German

Our experiment was implemented in a highly structured and low arousal classroom where distractions were kept to a minimum in order to help everyone focus on learning. The students sat at tables of two in three consecutive rows, facing forward towards the desk and the board. The rows of tables were divided by an aisle.

Design

A single-subject multiple-baseline design (ABA) across participants was used (Horner et al., 2005) consisting of a baseline phase (without intervention) (A1), a treatment phase (using the response cards) (B), and a return-to-baseline condition (A2). A simple AB design does not allow for positing a cause-and-effect relationship. However, adding a second A phase (A2) and observing an increase in behavior only during the treatment phase strengthens the argument that it was the intervention that was responsible for the improvements (Riley-Tillman & Burns, 2009).

Materials

White 5.8 x 8.3 inch cards were used as response cards. They were laminated so the students could write on them with non-permanent markers. Students received markers and wipes to erase answers between questions. To capture students' participation in classroom activities, we designed an observation scale, on which any attempt to give an answer to a question was recorded. We also prepared six different exercise sheets consisting of 10 questions or math problems each. The format of the quizzes was kept identical. We also tried to keep the level of difficulty constant across the six sheets. Five of the questions focused on repetition, five on new teaching content, and five questions aimed at securing knowledge transfer to everyday contexts. The six sheets consisted of three pairs, each focusing on certain content that was supposed to be taught during one particular week. We administered one test at the beginning and one test at the end of each week (i.e., before the first math lesson and after the last math lesson of the week). For every fully correct answer, the students received one point. The lessons followed a carefully prepared plan, focusing on volumes and weights. For each session, we created 15 questions that always required a particular solution to a math problem as a response and that were verbally posed to the students. (All materials are available from the first author upon request.)

Measures

The extent of active student participation in classroom activities was used as the key dependent variable. We used the aforementioned observation scale to document how often participants raised their hand or held up their response card to answer a question. In addition, we used the results on the quizzes to determine whether increases in participation led to increases in performance. For each week, we calculated the proportionate increase (in percent) between pre- and post-measurement. Which of the two test versions for each week was administered first to a particular participant was determined by chance. The observation scales were independently filled out by the main teacher and a graduate student of special education, who both sat at the back of the room. They also administered and scored all quizzes. Interrater reliability equaled 100% for both.

Procedures

Instruction was alternately provided by three female graduate students of special education. The experiment extended over a period of three weeks with five weekly lessons of 30 minutes each. On Monday, the instruction started at 9:15 am, on every other day of the week, it started at 10:20 am. Each session was systematically structured in accordance with basic Interactive Direct Instruction principles so students were able to build up their skills, with questioning being used to help them to make sense of a given task. The interventionists posed each of the prepared 15 questions to the class during each lesson such that every short sequence of instruction was separated by a question.

During baseline conditions, the interventionists motivated the students to actively participate. That is, at the beginning of each lesson, they encouraged the students to try to answer each question that they would ask during the next 30 minutes and to raise their hands often. Before the first lesson of the B phase, the interventionists instructed the whole class on how to use the response cards, as follows: (a) write down the answer, (b) hold up the card, (c) erase the answer, and (d) put down the card and marker. This process was practiced for 5 minutes. Then the interventionists again encouraged the students to actively engage in classroom activities, only this time they were asked to raise their completed response cards instead of their hands. The conditions during the A2 phase resembled the ones of the A1 phase.

Participation in classroom activities was documented by counting the number of responses to questions (either by raising a hand or a response card) during each of the 15 lessons. Proficiency level was assessed before each of the three Monday sessions and after the end of each of the three Friday sessions. Even though we were only interested in how the five target students performed, we administered the test to the whole class.

Results

Figure 1 shows the number of indications to respond to the interventionists' questions (RtQ) during the three phases. For all figures and statistical analyses, we used the SCAN package for R by Wilbert (2019).

As illustrated, four of the participants had rather stable baselines, while Student 1 showed a trend in A1. All of them improved their performance during intervention and returned to lower scores when response cards were not used any more (A2).

Student 1 averaged 6.80 RtQs (range = 2-10) in A1. The measurements during this phase showed a clear upward trend. However, as soon as the intervention was implemented, performance not only continued to improve, but the data indicated a significant leap. That is, on the first two days of phase B, Student 1 responded to every single question that the interventionist posed to the class. In fact, RtQs reached a mean of 14.40 during treatment, which corresponded with an average increase of 211.76% (range 13-15). Regardless of the trend in the A1, each score in the B phase exceeded those of the two A phases. The return to the second baseline phase (A2) coincided with a change in level, with the average RtQ decreasing by 77.78%, to 11.20 (range 9-12).

Student 2 scored an average of 3.00 RtQ (range 2-6) in A1. The introduction of the intervention was accompanied by a performance leap from 2 on day 5 to 15 on day 6. His mean value of RtQs during the B phase equaled 14.50

(range 14-15), which parallels an increase of 483.33%. After returning to baseline conditions (A2), his mean achievement dropped by 64.14%, to an average of 5.20 RtQs (range 1-10).

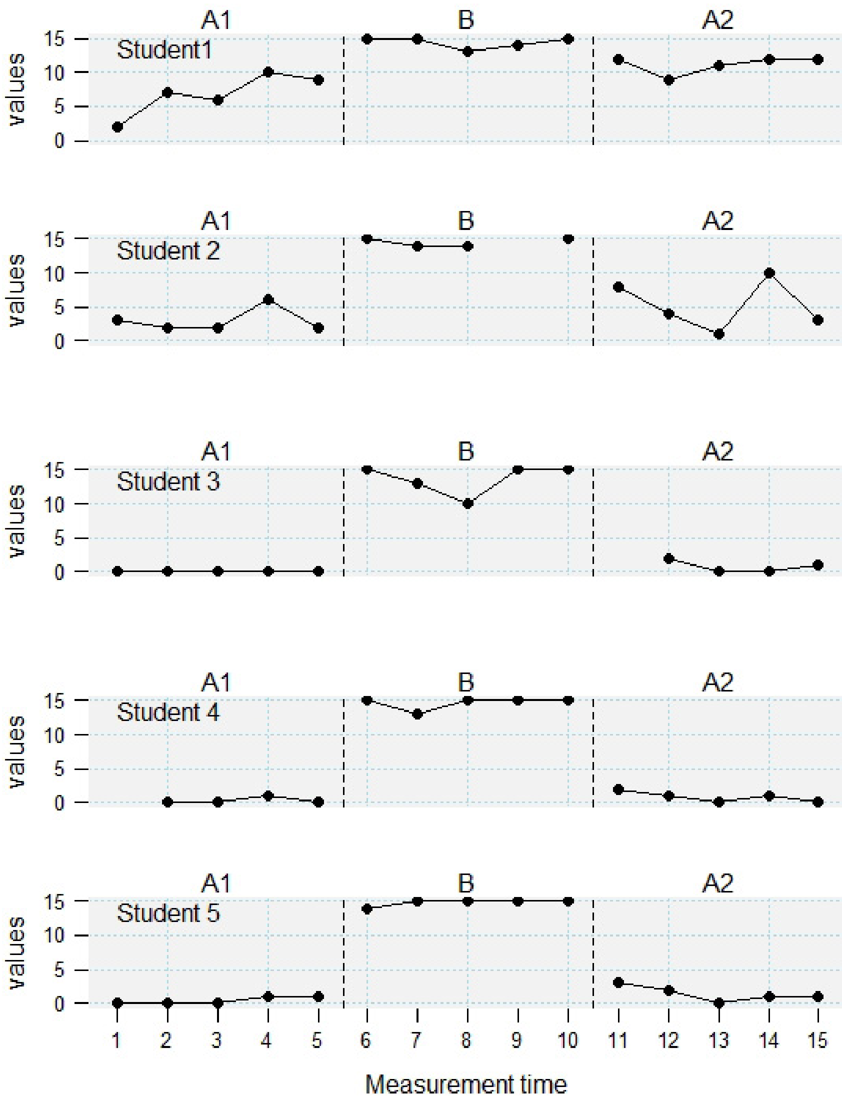

Figure 1. **Number of RtQs by the five participants in the three phases.**

Student 3 did not show any attempt to participate in classroom activities during the first baseline condition (A1), but with the start of the intervention, her performance increased from 0 to the maximum value of 15. She reached 13.60 RtQs, on average, during phase B (range 10-15) (a percentage increase could not be calculated due to an average value of 0 during the baseline phase). Just as remarkable as the increase in value from A1 to B, there was a distinct performance drop from B to A2, with an average performance of 0.75 (range 0-2), which corresponds to a decrease by 94.49%.

For Student 4, the mean RtQ value in A1 was 0.25 (range 0-1), which increased to a mean score of 14.60 (range 13-15) during B (this parallels an impressive percentage increase of 5,740). After the treatment stopped, his achievement dropped to a mean score of 0.80 (range 0-2) (which equals a decrease of 94.52%).

Student 5 started in A1 with an average RtQ value of 0.40 (range 0-1) and – like all the other students – showed an immediate increase in level with the beginning of the treatment. She rose from 1 RtQ on day 5 to 14 on day 6. Her mean value during intervention showed an increase from 0.40 to 14.80 (range 14-15) (which corresponds to a leap of 3,600%). With the end of the treatment phase, her performance dropped by 90.54%, to an average score of 1.40 (range 0-3).

Four of the most common non-overlap effect sizes comparing phases A1 and A2 to phase B were calculated: PND (percentage of non-overlapping data), PEM (percentage of data exceeding the median), PEM-T (percentage of data exceeding the median trend), NAP (non-overlap of all pairs) (Alresheed, Hott, & Bano, 2013). In each case, the participants received the highest possible outcome of 100%.

Next, a piecewise regression analysis was applied to each participant (Huitema & McKean, 2000). The results of this analysis are presented in Table 2.

Table 2. ***Piecewise Regression for Number of RtQs***

	B	*SE*	*t*	*p*	R^2
		Student 1			
Intercept	1.70	1.52	1.11	0.29	
Trend	1.70	0.46	3.71	0.01**	0.15
Level Phase B	4.50	1.89	2.38	0.04*	0.06
Level Phase A2	-3.90	1.89	-2.06	0.07	0.05
Slope B	-1.80	0.65	-2.78	0.02*	0.08
Slope A2	0.40	0.65	0.62	0.55	0.00
		Student 2			
Intercept	2.40	3.01	0.8	0.45	
Trend	0.20	0.91	0.22	0.83	0.00
Level Phase B	10.94	3.75	2.92	0.02*	0.18
Level Phase A2	-8.23	3.98	-2.07	0.07	0.09
Slope Phase B	-0.14	1.33	-0.11	0.92	0.00
Slope Phase A2	-0.46	1.33	-0.34	0.74	0.00
		Student 3			
Intercept	0.00	1.70	0.00	1.00	
Trend	0.00	0.51	0.00	1.00	0.00
Level Phase B	13.00	2.18	6.14	0.00**	0.17
Level Phase A2	-12.20	2.95	-4.14	0.00**	0.08
Slope Phase B	0.20	0.73	0.28	0.79	0.00
Slope Phase A2	-0.50	0.89	-0.56	0.59	0.00
		Student 4			
Intercept	-0.10	1.26	-0.08	0.94	
Trend	0.10	0.34	0.29	0.78	0.00
Level Phase B	13.60	1.03	13.23	0.00**	0.16
Level Phase A2	-13.00	1.00	-13.01	0.00**	0.16
Slope Phase B	0.10	0.42	0.24	0.82	0.00
Slope Phase A2	-0.60	0.34	-1.75	0.12	0.00
		Student 5			
Intercept	-0.50	0.65	-0.78	0.46	
Trend	0.30	0.19	1.54	0.16	0.00
Level Phase B	13.20	0.80	16.47	0.00*	0.16
Level Phase A2	-12.30	0.80	-15.35	0.00*	0.14
Slope Phase B	-0.10	0.28	-0.36	0.72	0.00
Slope Phase A2	-0.70	0.28	-2.55	0.03*	0.00

Note: * Significant at the 5% level; ** significant at the 1% level.

In summary, the analyses yielded significant level effects from A1 to B for all participants, and from B to A2 for all except Student 2, whose values slightly failed to reach statistical significance (p = 0.07). However, aggregating the five cases into one as part of a level 2 analysis resulted in very clear level effects between phases (see Table 3).

Table 3. ***Piecewise Regression Model for Number of RtQs***

	B	*SE*	*t*	*p*
Intercept	0.63	1.54	0.41	0.68
Trend	0.48	0.35	1.37	0.18
Level Phase B	11.02	1.38	8.01	0.00**
Level Phase A2	-9.77	1.45	-6.76	0.00**
Slope B	-0.35	0.48	-0.73	0.47
Slope A2	-0.44	0.48	-0.91	0.37

Note: ** Significant at the 1% level.

Finally, we considered possible gains in math performance. Student 2 was not able to complete the quizzes, because he was otherwise engaged. The rest of the participants attended all six testing sessions. Figure 2 depicts the proportionate pre-/post-improvements of each student for Week 1 (A1), Week 2 (B), and Week 3 (A2)

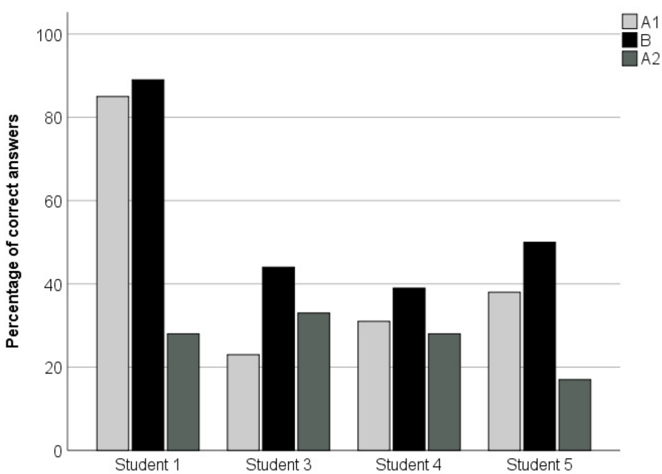

Figure 2. Proportionate increase in math competence during the three phases for Students 1, 3, 4, and 5.

As illustrated, the performance increase in Week 2 was always larger than in any other week. This confirms the assumption that there was always growth in learning, but the gains were never as large as when the response cards were used.

Discussion

This study examined the effects of a response card intervention based on Interactive Direct Instruction principles on the engagement in classroom activities during math lessons of five typically unengaged seventh graders with LD. The results indicate that in all cases the number of RtQs increased strikingly as soon as the cards were introduced. Improvements from the baseline condition to the treatment phase reached statistical significance in all five cases with non-overlap indices reaching their maximum value of 100%. The drops in performance were equally striking as soon as the response cards were no longer in use. In addition, we tested students' performance level at the beginning and the end of each week. When the response cards were used, the students achieved a higher growth in learning than if they were just encouraged to actively participate by raising their hands.

Despite these impressive results, the study is subject to certain limitations. First, the small sample size and the fact that all lessons were geared toward teaching a particular topic limit the generalizability of the results. Second, the selection of the participants was left to the discretion of the main teacher. No clear-cut criteria were used. This makes replication of the results difficult. Third, the observers were not blind to the purpose of the study. They knew what the implementation of the response card intervention was aiming at. Fourth, we tried to keep the level of difficulty equal across the performance quizzes. However, we have not tested to what extent we achieved that goal. Finally, we used a reversal design (ABA) with only one treatment phase. Even though student engagement increased greatly from A1 to B, and subsided equally marked from B to A2, we cannot be sure if the differences would have been comparably distinct if we had incorporated another B phase. The participants were without a doubt very responsive to the intervention. However, part of that may be due to the fact that the response cards were new and unfamiliar to them. Thus, it is possible that a habituation effect would have set in if we had continued with the changes of phases (e.g. by applying an ABAB or an ABABAB design).

Giving these limitations, the practical implications of this study nevertheless support the systematic use of response cards during instruction to increase OtR and classroom participation, which in turn results in increased content mastery. Based on our participants, who presented as uninterested or uncertain about their ability to respond to questions in class, when given the OtR within the safety of unison responding, each demonstrated an interest in participating. This is of no small importance. Many teachers struggle greatly as they try to involve all of their students in classroom activities and be mindful of students who are shy and reluctant to raise their hands in class.

All too often, educators pose questions to the whole class and create situations in which the more able and outgoing learners feel encouraged to respond, whereas the more timid stay in the background. Response cards seem to be an excellent way of involving even the most diffident students to participate. Holding up a piece of cardboard along with everyone else in the class does not seem very intimidating. However, encouraging learners to do so at every given OtR seems to get them more into a lesson and to acquire more of the curriculum content that is being taught. Thus, response cards offer an easy-to-implement and low-cost solution to the challenge of engaging even the most reluctant students.

Our findings replicate those of Christle and Schuster (2003) and add to the growing body of research on the use of response cards with students with special needs (e.g., Cakiroglu, 2014; Didion, Toste, & Wehby, in press; Goodnight, Whitley, & Brophy-Dick, in press; Rao, 2018). Even though our study sheds some light on this quick-and-easy way to increase student response rates in lessons, a number of research questions still need to be addressed in order to widen the knowledge base on this kind of intervention. For example, future studies may consider collecting data over a longer span of time and with more reversal phases to either support or dispute the possibility that increased participation may be the result of the novelty of using response cards for the first time. Another consideration for future research is to include a sample of students who regularly participate. This will allow researchers to investigate the effect response cards have on the participation and performance of students perceived to ready be active participants.

References

Adamson, R. M., & Lewis, T. J. (2017). A comparison of three opportunity-to-respond strategies on the academic engaged time among high school students who present challenging behavior. *Behavioral Disorders, 4*, 41–51.

Alresheed, F., Hott, L. B., & Bano, C. (2013). Single subject research: A synthesis of analytic methods. *Journal of Special Education Apprenticeship, 2*, 1–18.

Blood, E. (2010). Effects of student response systems on participation and learning of students with emotional and behavioral disorders. *Behavioral Disorders, 35*, 214–228.

Bondy, A. H., & Tincani, M. (2018). Effects of response cards on students with autism spectrum disorder or intellectual disability. *Education and Training in Autism and Developmental Disabilities, 53*, 59–72.

Brophy, J., & Good, T. (1986). Teacher behavior and student achievement. In M. Wittrock (Ed.), *Handbook of research on teaching* (pp. 328–375). New York, NY: MacMillan.

Cakiroglu, O. (2014). Effects of preprinted response cards on rates of academic response, opportunities to respond, and correct academic responses of students with mild intellectual disability. *Journal of Intellectual & Developmental Disabilities, 39*, 73–85.

Christle, C. A., & Schuster, J. W. (2003). The effects of using response cards on student participation, academic achievement, and on-task behavior during whole class, math instruction. *Journal of Behavioral Education, 12*, 147–165.

Davis, L. L., & O'Neill, R. E. (2004). Use of response cards with a group of students with learning disabilities including those for whom English is a second language. *Journal of Applied Behavior Analysis, 37*, 219–222.

Didion, L. A., Toste, J. R., & Wehby, J. H. (in press). Response cards to increase engagement and active participation of middle school students with EBD. *Remedial and Special Education.*

Duchaine, E. L., Green, K. B., & Jolivette, K. (2011). Using response cards as a class wide intervention to decrease challenging behavior. *Beyond Behavior, 20*, 2–10.

Duchaine, E. L., Jolivette, K., Fredrick, L. D., & Alberto, P. (2018). Response cards: Increase engagement and achievement in high school inclusion science and mathematics classes. *Learning Disabilities: A Contemporary Journal, 16*, 157–176.

Engelmann, S. (2017). *Successful and confident students with direct instruction.* Eugene, OR: NIFDI Press.

Engelmann, S., & Carnine, D. (2016). *Theory of instruction: Principles and applications* (2nd ed.). Eugene, OR: NIFDI Press.

George, C. L. (2010). Effects of response cards on performance and participation in social studies for middle school students with emotional and behavioral disorders. *Behavior Disorders, 35*, 200–213.

Goodnight, C. I., Whitley, K. G., & Brophy-Dick, A. A. (in press). Effects of response cards on fourth-grade students' participation and disruptive behavior during language arts lessons in an inclusive elementary classroom. *Journal of Behavioral Education.*

Grünke, M., & Morrison Cavendish, W. (2016). Learning disabilities around the globe: Making sense of the heterogeneity of the different viewpoints. *Learning Disabilities: A Contemporary Journal, 14*, 1–8.

Haydon, T., Marsicano, R., & Scott, T. M. (2013). A comparison of choral and individual responding: A review of the literature. *Preventing School Failure, 57*, 181–188.

Haydon, T., Richmond Mancil, G., & Van Loan, C. (2009). Using opportunities to respond in a general education classroom: A case study. *Education and Treatment of Children, 32*, 267–278.

Horner, R. H., Carr, E. G., Halle, J., McGee, G., Odom, S., & Wolery, M. (2005). The use of single-subject research to identify evidence-based practice in special education, *Council for Exeptional Children, 71*, 165–179.

Huitema, B. E., & McKean, J. W. (2000). Design specification issues in time-series intervention models. *Educational and Psychological Measurement, 60*, 38–58.

Kaufman, A. S., & Kaufman, N. L. (2004). *Kaufman Assessment Battery for Children* (2nd ed.). Circle Pines, MN: American Guidance Service.

MacSuga-Gage, A. S., & Simonsen, B. (2015). Examining the effects of teacher-directed opportunities to respond on student outcomes: A systematic review of the literature. *Education and Treatment of Children, 38*, 211–240.

Menzies, H. M., Lane, K. L. Oakes, W. P., & Ennis, R. P. (2017). Increasing students' opportunities to respond: A strategy for supporting engagement. *Intervention in School and Clinic, 52*, 204–209.

Moser Opitz, E., Reusser, L., Moeri Müller, M., Anliker, B., Wittich, C., Freesemann, O., & Ramseier, E. (2010). *BASIS-MATH 4-8*. Göttingen, Germany: Hogrefe.

Narayan, J. S., Heward, W. L., Gardner, R., Courson, F. H., & Omness, C. K. (1990). Using response cards to increase student participation in an elementary classroom. *Journal of Applied Behavior Analysis, 23*, 483–490.

Owiny, R. L., Spriggs, A. D., Sartini, E. C., & Mills, J. R. (2018). Evaluating response cards as evidence based. *Preventing School Failure: Alternative Education for Children and Youth, 62*, 59–72.

Parsons, S. A., Nuland, L. R., & Parsons, A. W. (2014). The ABCs of student engagement. *Phi Delta Kappan*, *95*, 23–27.

Riley-Tillman, T. C., & Burns, M. K. (2009). *Evaluating educational intervention: Single-case design for measuring response to intervention.* New York, NY: Guilford.

Rao, M. (2018). Enhancing student engagement and immediate feedback with clickers and response cards. *International Journal of Innovation and Learning, 24*, 81–97.

Twyman, J. S., & Heward, W. L. (2018). How to improve student learning in every classroom now. *International Journal of Educational Research, 87*, 78–90.

Watkins, C. L., & Slocum, T. A. (2004). The components of direct instruction. In N. E. Marchand-Martella, T. A. Slocum, & R. C. Martella (Eds.), *Introduction to direct instruction* (pp. 29–65). Boston, MA: Pearson.

Wilbert, J. (2019). *Package "Scan."* Retrieved from https://www.uni-potsdam.de/fileadmin01/projects/inklusion/scan/scan.pdf

Authors' Note

Correspondence concerning this article should be addressed to Nicole Müllerke, MA, Special School Geisbach, Hanftalstr. 31, Hennef, Northrhein-Westfalia, 53773, Germany; Email: muellerke@t-online.de.