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OPPORTUNITIES TO RESPOND WITHIN THE CLASSROOM TO ENHANCE LEARNING FOR STUDENTS WITH LEARNING DISABILITIES

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OPPORTUNITIES TO RESPOND WITHIN THE CLASSROOM TO ENHANCE LEARNING
FOR STUDENTS WITH LEARNING DISABILITIES

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A capstone project submitted for Graduation with University Honors

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ABSTRACT

As students diagnosed with learning disabilities (LD) face disadvantages in the classroom, there is an increasing need to better understand how educators can increase equitable instruction and aid students in overcoming educational challenges. Previous research has shown that students with LD respond well when presented with Opportunities to Respond (OTRs). In several studies, the incorporation of OTRs within existing curriculum increased academic engagement and overall student outcomes for students with learning disabilities. This study uses data collected by the Special Education Research Accelerator (SERA) through three classroom observations during fifth-grade science lessons. Data was collected by determining the number and type of OTRs presented to a target student identified as having a learning disability compared to the number and type presented to the whole class and other individual students. The findings revealed that the target student received far less OTRs, as well as less variety in type of OTR. Furthermore, findings revealed a pattern in teacher-directed responses and leading questions. In combination, these findings suggest a lack of depth in the presented OTRs as well as limited opportunity for engagement for the target student. The present study highlights the importance of equitable instructional practices and suggests an imbalance in who is receiving opportunities for engagement within the classroom, as well as the quality of these opportunities.

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INTRODUCTION

Students identified as having a learning disability (LD) may face significant barriers in accessing and engaging with academic content. As of 2023, the largest single percentage of students who received special education in the United States were identified as having a specific LD (National Center for Education Statistics). With such a large portion of special education students being impacted by LD, it is increasingly important to find effective interventions and practices to improve the educational experience of these students.

One promising area of research in supporting students with LD centers around the use of Opportunities to Respond (OTR), where students are presented structured opportunities to engage with academic instruction. OTRs have been shown to improve student academic performance, classroom engagement, and behavioral outcomes (Sutherland & Wehby, 2001; MacSuga-Gage & Simonsen, 2015; Van Camp et al., 2020). For students with LD especially, OTRs can provide critical opportunities for student engagement through feedback and inclusion during instruction that may be absent otherwise.

Despite the documented benefits, the present study revealed that students with LD may receive fewer OTRs compared to their peers. Furthermore, while existing research has investigated the effects of OTRs in areas such as reading and mathematics, relatively few studies have examined the implementation of OTRs during science instruction or focused specifically on students with LD (Gardner et al., 1994; Schwab et al., 2013). This represents a critical gap in existing research, as the research that does exist suggests that students with LD can benefit greatly from increased OTRs in the classroom (Schwab et al., 2013; Young et al., 2018; Pfeifer et al., 2023). This project aims to fill this gap and identify how frequently students with LD are

provided OTRs compared to their peers, the types of OTRs most commonly used, and how students with LD engage with instructional content in relation to their peers.

BACKGROUND

In educational research, there continues to be a focus on improving the quality of instruction for students with disabilities, particularly students identified with LD. With the number of students identified as needing Special Education doubling in the last 40 years (Pendharker, 2023), finding ways to improve student achievement among students with LD becomes more relevant and important. One area of research that shows promise with improving student achievement is by understanding how OTR affects students at different ages and in different subjects, including students identified with LD. The purpose of this literature review is to examine the existing literature to understand what is known about OTRs specifically for students with LD. Research on OTRs has occurred across several different academic subjects (Sutherland & Wehby, 2001; Stichter et al., 2009). However, within this body of research, only a small number of studies have focused on the results of increased OTRs during science instruction in elementary classrooms (Gardner et al., 1994), as well as the effects of OTRs on students with learning disabilities (Schwab et al., 2013). The few studies that have been conducted report findings that indicate that providing adequate OTRs to students does support positive results in regards to student achievement (Gardner et al., 1994).

Opportunities to Respond

Several studies on OTR have shown that increasing OTRs in the classroom has a positive impact on students (Sutherland & Wehby, 2001; Stichter et al., 2009; MacSuga-Gage & Simonsen, 2015; Menzies et al., 2016; Leahy et al., 2018; Van Camp et al., 2020). There are several factors that impact the use of OTRs in the classroom, which may also have implications

for LD students, such as improved engagement and behavioral outcomes (Yanoff, 2006; Stichter et al., 2009; Hirn et al., 2018; Young et al., 2018). Research suggests that increased OTRs may lead to improved student outcomes in the following areas: (1) student behaviors (Sutherland & Wehby, 2001; Schwab et al., 2013; MacSuga-Gage & Simonsen, 2015; Leahy et al., 2019), (2) academic achievement (MacSuga-Gage & Simonsen, 2015; Van Camp et al., 2020), and (3) student engagement (Sukovskyy, 2014; Menzies et al., 2017). OTRs have also been used as an intervention for students with challenging behaviors or other academic difficulties (Sutherland & Wehby, 2001; Schwab et al., 2013; Van Camp et al. 2020). For this literature review of the effects of OTRs during general education instruction, a total of ten studies were located, with two of those studies being conducted during science instruction.

Student Behaviors. One of the positive effects increased OTRs has on students is improved behavioral outcomes (Sutherland & Wehby, 2001; Schwab et al., 2013; MacSuga-Gage & Simonsen, 2015; Leahy et al., 2019). For students with Emotional and Behavioral Disorders (EBD), increasing OTRs can be particularly effective in improving challenging behaviors (Sutherland & Wehby, 2001; Schwab et al., 2013). A review of literature conducted by MacSuga-Gage & Simonsen (2015) and a quantitative synthesis of research following a single-case design by Leahy et al. (2019) concurrently found that increasing the use of teacher directed OTRs (TD-OTRs) in the classroom, which involves guiding students by asking questions or providing an initial prompt to students in order to elicit a response, had a direct positive impact on student behavioral outcomes. While students with challenging behaviors are likely to benefit from OTRs, research suggests that OTRs have the capacity to prevent problem behaviors for students who aren't exhibiting these types of behaviors regularly due to higher academic task engagement and achievement (Sutherland & Wehby, 2001; Leahy et al., 2019).

Academic Achievement. Research on the effects of OTRs suggests that increasing the use of OTRs in the classroom has a direct impact on student academic performance (MacSuga-Gage & Simonsen, 2015; Van Camp et al., 2020). MacSuga-Gage & Simonsen, 2015 conducted a systematic literature review that examined the effects of TD-OTRs on academic performance, as well as behavioral outcomes. The review screened 527 abstracts and coded 15 empirical studies. Through this review, researchers found that this method yielded positive results for academic performance while also providing an opportunity for informal assessment of students via their responses (MacSuga-Gage & Simonsen, 2015).

Existing literature has also found that incorporating OTRs as part of interventions can benefit students academically and, in combination, intensify the effects of other methods of intervention (Van Camp et al., 2020). In the previously discussed meta-analysis conducted by Van Camp et al. (2020), the studies analyzed revealed that adopting multitiered systems of support (MTSS) and including OTRs into curriculum led to improved academic outcomes, among other benefits. The effects of the studies were synthesized to reveal a consistent increase in student outcomes with the implementation of increased OTRs.

Student Engagement. Another positive effect of increased OTRs in the classroom is an increase in student engagement (Sukovskyy, 2014; Menzies et al., 2017). Sukovskyy (2014) conducted a study which examined the impact of incorporating teacher training to manipulate rates of OTR as well as positive feedback provided to students in order to increase student engagement. This study followed an ABAB withdrawal design to determine if teacher training led to increased OTRs in the classroom. The study did face several limitations and failed to establish a functional relation between teacher training and increased OTRs, but implies a baseline understanding that increased OTRs leads to increased student engagement.

Another study by Menzies et al. (2017) offers a practice-based rationale for increasing OTRs in the classroom as well as incorporating low-intensity support to students in order to promote student academic engagement. Menzies et al. (2017) states that it is a necessity to manage student behavior, and suggests increasing student engagement to combat challenging behaviors in the classroom. In the article, Menzies et al. (2017) offers a step by step technique to increase OTRs in the classroom and, therefore, increase student engagement.

OTR as an Intervention. It is common that OTRs in the classroom are used as a method of intervention to improve student experiences and outcomes (Sutherland & Wehby, 2001; Schwab et al., 2013; Van Camp et al., 2020). A meta-analysis conducted by Van Camp et al. (2020) revealed that existing literature supports the use of OTRs in order to intensify academic and behavioral interventions. Using OTRs in combination with other intervention efforts can be particularly useful for students with academic and/or behavioral challenges (Van Camp et al., 2020). The meta-analysis consisted of 29 studies and focused on the effects of incorporating MTSS into instruction, focusing specifically on the practice of increasing OTRs in the classroom as an intervention method and its effects. The meta focused on studies that examined the effects of OTRs as an intervention technique and included studies that involved both students with and without an identified disability. In the analysis, 48.4% of students involved in the studies had an identified disability, which included LD, EBD, other health impairments, autism, multiple disabilities, speech or language impairments, and intellectual disabilities, with ages ranging from prekindergarten to 12th grade. Results indicated that the average effect size for increased OTRs was significant, increasing almost one standard deviation above baseline levels, at a 112.8% increase in OTRs from baseline levels to intervention phases. Findings of the meta-analysis suggest that OTRs are an effective method in instructional and behavioral intervention for

students with and without disabilities. Despite the large amount of studies present in the meta-analysis, only one study involved incorporating OTRs into Science instruction as a method of intervention. This study, conducted by Cavanaugh et al. (1996) used response cards as a method of increasing student recall in the science classroom. Although there are few studies that focus specifically on increasing OTRs in the science classroom, the findings of the Cavanaugh et al. (1996) study yielded positive results.

One study by Sutherland and Wehby (2001) found that existing literature supports increasing the number of OTRs in the classroom to improve academic and behavioral outcomes, specifically for students with EBD. Because students with LD are at a high risk for also having EBD, understanding these implications can be useful in improving these student's educational experiences (Bonti et al., 2024). This study was done as a literature review that included 6 studies to examine the effects of OTRs on academic and behavioral outcomes for students with EBD. Findings revealed that, for students with EBD, increased rates of OTRs led to more engagement on academic tasks as well as lower behavioral incidents, however, students with EBD rarely receive adequate OTRs (Sutherland & Wehby, 2001).

A study by Schwab et al. (2013) found that using response cards as a method of OTR increased student outcomes for students with LD and challenging behaviors. This study was conducted in one classroom consisting of 25 students, including 5 students with an identified LD and 4 students with EBD. Findings of the study revealed that integrating schema-based instruction with response cards as a method of OTR increased student engagement, specifically for students with LD and EBD (Schwab et al., 2013). It is worth mentioning that, despite the success of the study, the small scale and lack of replication of the study limits the generalizability of the findings.

Factors Impacting Use of OTR

Several factors have been found to impact the implementation of OTRs in the classroom (Stitcher et al., 2009; Cavanaugh, 2013; Hirn et al., 2018; Common et al., 2020). These factors include the following: attending a high versus low risk school (e.g. Title I vs. non Title), student population SES status, and teacher feedback in the classroom. Stichter et al. (2009) offers a comparison among the use of OTRs in both high and low risk elementary schools. The study analyzed use of OTRs and classroom management strategies among Title I and non Title schools. Findings indicate a clear relationship between SES status, indicated by school title, and OTRs as well as other classroom management strategies, where lower SES status correlated to poorer student environment, categorized by student work displayed, classroom setup, procedures, and product levels. Similarly, findings from a study from Hirn et al. (2018) highlight the differences in use of OTRs, performance, and SES status, particularly between Title I versus non Title schools. Cavanaugh (2013) conducted a literature review, which found a correlation between teacher feedback and OTRs. In the study, increased OTRs positively impacted performance feedback, but the reciprocal relationship is unclear.

Science Instruction. After completing a thorough review of the literature, only two studies were identified to support the use of OTRs during science instruction specifically. However, both studies showed a positive impact on the use of OTRs in the science classroom setting (Gardner et al., 1994; Jarret, 1999). In the Gardner et al. (1994) study, response cards were found to be an effective method of OTR during science instruction. Jarret (1999) offers a guide on research-based instructional strategies to use during science instruction, particularly for students with LD. The guide suggests the use of an inquiry-based method, which implies the inclusion of OTR.

Learning Disabilities. In order to understand how OTRs can impact students with LD, it is important to understand how students with LD learn and respond to types of instruction in school (Yanoff, 2006; Young et al., 2018). The term “Specific Learning Disability” is defined under the 2004 Individuals with Disabilities Education Act as “a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, that may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations, including conditions such as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia.” This can include, but is not limited to, reading ability, comprehension, mathematics, perception, memory, and more (Yanoff, 2006). About 51 percent of special education students, the largest single percentage in this area, are learning disabled (Yanoff, 2006). With so many students being affected by LD, it is important to find feasible ways to aid these students in learning to their full ability during instruction.

Conclusion

While little research exists regarding the use of OTRs for students with LD, the research that does exist consistently yields positive results in relation to the increased use of OTRs and student outcomes for students with LD (Schwab et al., 2013; Young et al., 2018; Pfeifer et al., 2023). The studies reviewed imply that OTRs are a viable approach to increasing student engagement, academic performance, and behavioral outcomes. For students with LD, this can be particularly useful to help maintain focus and be held accountable for specific tasks. While implications for science instruction specifically are limited, we can conclude that OTRs during science instruction would likely improve student outcomes similarly to math, reading, and writing instruction.

METHODS

This study analyzed the following research questions: (1) At what frequency do students identified with a Learning Disability (LD) receive Opportunities to Respond (OTR) compared to their peers?, (2) What types of OTR were most common?, and (3) How do students with LD engage with content, as compared to their peers without LD? To address these research questions, a mixed methods approach was used, where both quantitative and qualitative data were analyzed. Quantitative data from observations were examined using descriptive statistics, and quantitative data gathered from transcripts were examined using both inferential and descriptive statistics. Qualitative data was gathered from work samples and transcripts and examined using thematic analysis in order to identify patterns in instruction and engagement. In this study, one student identified as having a LD was labeled as the target student. Given the limited sample size, this study was treated as a case study.

Data preparation and cleaning. Data taken directly from the completed observation sheets was inputted into an excel spreadsheet. Due to the small sample used in this study, only descriptive statistics were included, and assumptions of normality were not formally checked for these datasets. Data was also collected from lesson transcripts, and coded based on whether the questions the teacher presented were closed-ended or open-ended and which student was presented the question (target student, other students, whole class, or unidentified). Closed-ended questions were defined as those with a yes/no answer or a predetermined set of responses. Transcripts occasionally labeled a student as unidentified, which was given its own category. Transcript data was analyzed using *t*-tests and Pearson correlation tests, and both descriptive and exploratory inferential statistics were conducted. Qualitative data was gathered from student

work samples and lesson transcripts and examined through an analysis using open coding in order to identify themes and patterns in instructional practices used and in student engagement.

Quantitative data analysis. In the data collected, three observations were compared. As seen in Figure 1, other students received the vast majority of OTRs. Across the three observations, the target student received an average of three OTRs per lesson, compared to 13 for the whole class and 54 for other students, as seen in Table 1. For the observation data ($n=3$), mean and median values were identical because the dataset was small, symmetrical, and contained no outliers. This indicated that both measures of central tendency accurately represented the typical number of OTRs observed. Verbal OTRs were the most common by far, averaging 51 verbal OTRs per lesson ($n=3$). Hands-on activities and “other” OTRs did not occur, as seen in Figure 2. Data from lesson transcripts ($n=12$) was gathered and coded based on how many closed-ended versus open-ended questions were presented to the target student, other students, the whole class, or unidentified students. Figure 3 shows that most of the questions presented to students were open-ended. Analysis from the transcript data revealed that the target student received an average of 1.2 open-ended questions per lesson and received no closed-ended questions across all 12 transcripts analyzed. Other students received an average of 16.5 open-ended questions and 0.25 closed-ended questions. Correlational analyses indicated moderate positive relationships between open-ended questions directed at the target student and those directed at other students ($r=.59$, $n=12$, $p<.001$), as well as between the target student and the whole class ($r=.56$, $n=12$, $p<.001$). Closed-ended questions for the target student showed little variation, and therefore correlations could not be calculated.

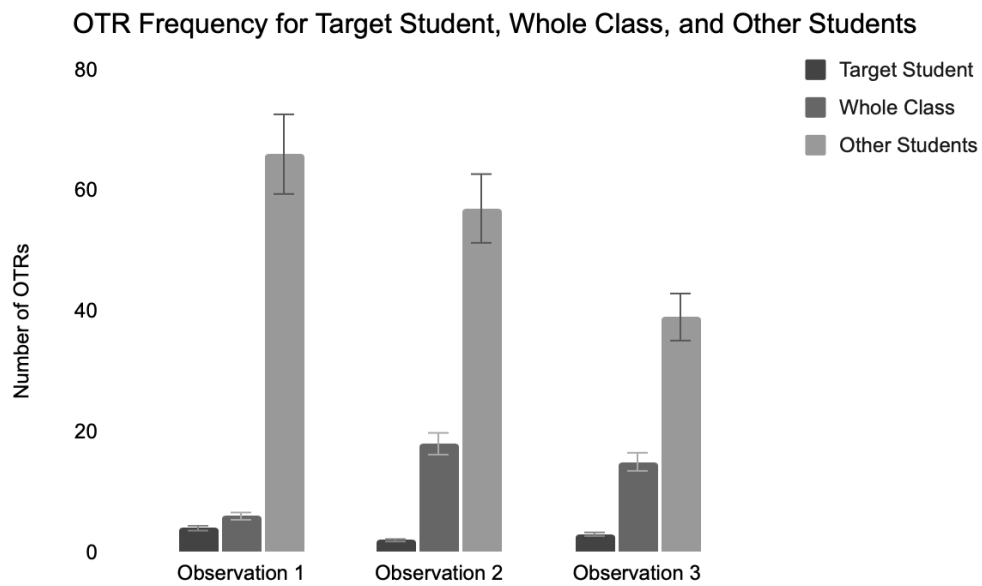


Figure 1. *OTR Frequency for Target Student, Whole Class, and Other Students*

	Target Student	Other Students	Whole Class
Mean	2.5	16.5	48
Median	2.5	16.5	48
SD	1	6.244997998	13.74772708

Table 1. *Frequency of OTRs Across Three Observations*

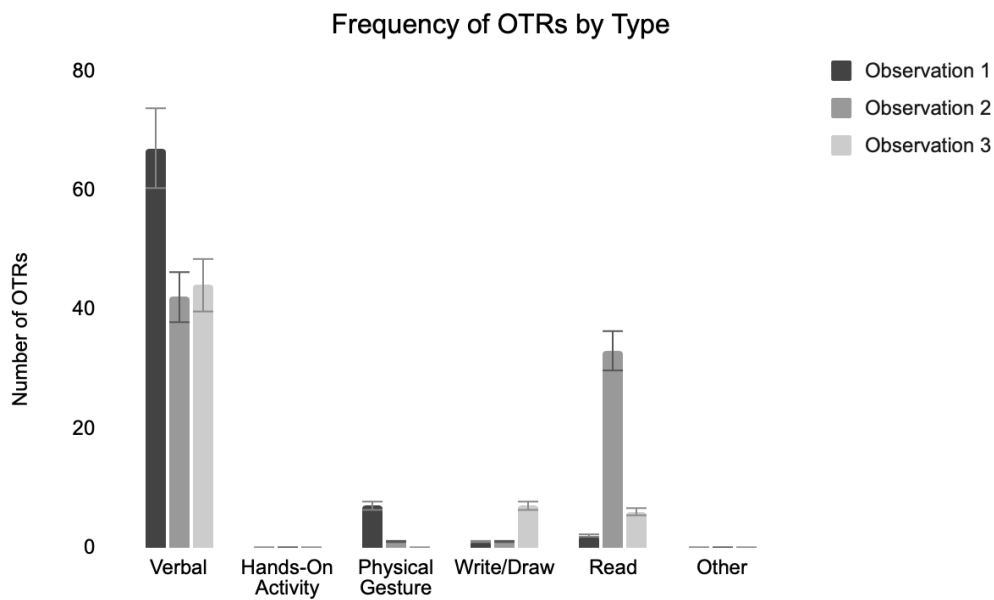


Figure 2. *Frequency of OTRs by Type*

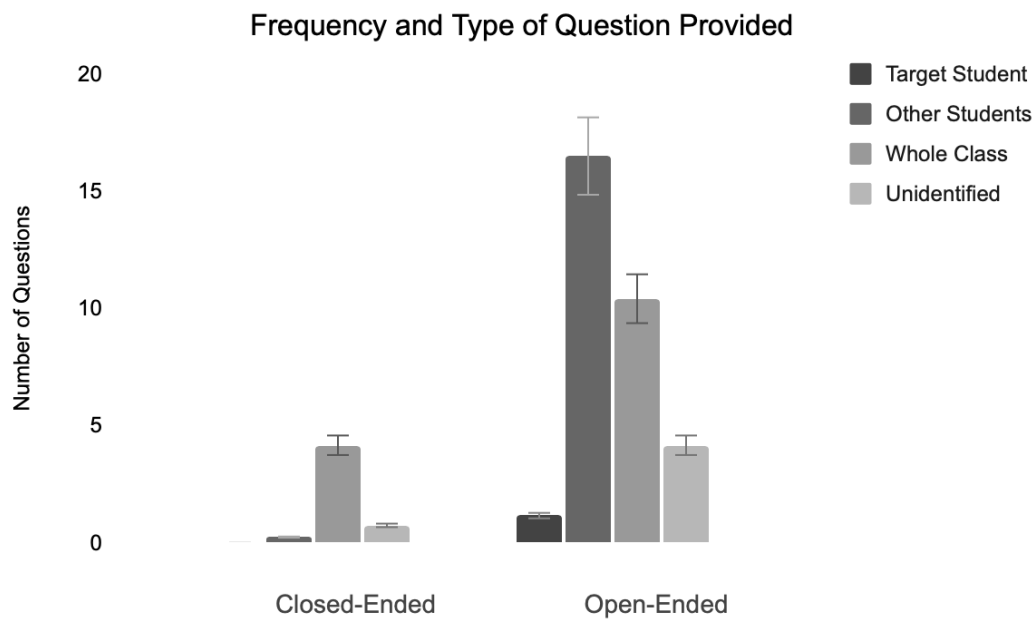


Figure 3. *Frequency and Type of Question Provided*

Qualitative data analysis. Qualitative codes were developed inductively, as they emerged from the data itself and were not based on an existing framework. The coding process began through open coding of 12 transcripts of classroom lessons and available student work samples, where instances of teacher questioning and student responses were labeled according to the type of interaction (e.g., leading question, teacher-directed work, etc.). The initial codes were then refined into broader themes in order to capture recurring patterns across the available data. Because coding and observations were conducted by a single researcher, inter-rater reliability was not assessed. Despite this limitation, the coding process emphasized transparency through repeated reviewing of data in order to ensure consistency within how the codes were applied.

Analysis of transcripts and student work samples revealed a few emergent themes. Thematic analysis revealed a pattern in the use of leading questions by the teacher, meaning the teacher's questions suggested the expected answer (e.g. "The atmosphere is kind of like a blanket. So if it's like a blanket, what does it do for us?"). These occurred across all 12 transcripts analyzed and were directed towards the whole class as well as individual students, which includes the target student. For example, in one interaction, the teacher asked, "Do you guys know what the biggest, not really object, but do you guys know what the biggest mass is in the solar system? Like Earth is pretty big, but you know what's bigger than the Earth? And it's actually the biggest thing in our solar system? [Target Student], do you know?" to the target student, where they replied "I think it's the sun." While asking questions like these do allow for participation, they don't necessarily encourage independent thinking or allow much room for independent problem solving. This pattern aligns with the finding that the instructional practices seen in this study tend to emphasize student recall over the development of ideas through the students themselves. Furthermore, analysis of student work samples revealed a pattern of

teacher-directed responses and work. In the samples analyzed, the teacher guided student responses and drawings, with many of the student samples including the same phrases and diagrams. For example, work samples from one lesson all included an identical drawn diagram, with the same labels on each. The transcripts also showed scenarios where the teacher directed students to write sentences that were directly from the text or from the lesson materials. This demonstrated the limited opportunity that all students, including the target student, had to show their individual understanding of the concepts presented in the lesson. It also reinforces the pattern seen in the transcripts, as both leading questions and teacher-directed work both lead to a lower cognitive demand for students.

Integration of findings. Throughout the quantitative and qualitative findings, there is a consistent pattern of instructional practices that emphasized a strong theme of teacher-direction in both class participation and student work. Analyses of quantitative and qualitative data revealed that (1) the target student received fewer OTRs than other students and the class as a whole, (2) most OTRs presented were verbal in nature, and (3) the target student received no closed-ended questions at all across the 12 transcripts analyzed, and only a very small number of open-ended questions. These findings further highlight the limited opportunities for classroom engagement. Quantitative results align with the themes that emerged from qualitative analyses of transcripts and student work samples, which showed a reliance on teacher-directed and teacher-led responses. Both quantitative and qualitative analyses intersect to suggest that, while the target student was included, classroom interactions were highly structured by the teacher, and offered little room for independent student expression.

Summary of key findings. Several key findings emerged from this study. Analyses revealed that students with LD received fewer OTRs compared to their peers and that the vast

majority of OTRs that were observed were verbal, which both indicated limited engagement opportunities. Both transcript and work sample analyses also revealed that instruction and participation was shaped largely by teacher-led instructional practices. Collectively, all findings suggest that OTRs in the observed lessons were present but restricted in both form and depth. This provides important implications for how students with LD access and engage with classroom content.

DISCUSSION

The findings of this study highlight important patterns in how students with LD engage with classroom instruction. Both quantitative and qualitative analyses found that the target student received fewer OTRs compared to peers, and the OTRs provided were largely limited in variety and depth. These results are consistent with existing research showing that students with disabilities are often underrepresented in classroom participation (Sutherland & Wehby, 2001; Schwab et al., 2013). While previous studies have demonstrated the positive effects of increasing OTRs on student engagement, behavior, and achievement (MacSuga-Gage & Simonsen, 2015; Van Camp et al., 2020), the present study suggests that students with LD may not be receiving equitable access to these benefits within the typical classroom setting.

The reliance on teacher-directed opportunities also raises important questions in regards to how much participation and engagement is limited during classroom activities. While this type of questioning allows for some participation, it limits opportunities for independent and deeper thinking. This aligns with research suggesting that OTRs, when limited to teacher-directed forms, may restrict the potential benefits for students with disabilities (Leahy et al., 2019). For students with LD, who may need repeated practice and feedback to build skills, this reliance on teacher-directed OTRs can allow for additional barriers.

These findings have several implications for classroom practice. Teachers could expand on the use of typical OTRs by incorporating other, lesser used methods, such as written responses or hands-on activities. This would diversify the ways students can demonstrate their understanding while also reducing the potential overuse of memorization and verbal recall, leading to deeper understanding of instructional material. Professional development that emphasizes intentional planning of OTRs, particularly for students with LD, could aid in cultivating more equitable learning environments.

Limitations. There are several limitations that should be noted in this study. This study was based on a small case study from a single fifth grade classroom, including three observations and 12 transcripts. Because of this, findings cannot be generalized and should be interpreted as exploratory. The limited variation in some variables, such as closed-ended questions for the target student, restricted the ability to inferential statistics on some data, and reduced the ability to identify potential broader trends. Work samples were also particularly uniform, which limited the ability to assess student understanding through the lessons. Potential teacher behavior variability and variability in the classroom itself may also impact the reliability of results. Finally, only Mathematics and Language Arts testing data were available for the target student, which provided a limited image of academic performance and its relevance to classroom engagement.

Future Directions. Future research should continue to explore how OTRs are implemented for students with LD across subjects and grade levels. Given the limited number of studies focused on science instruction (Gardner et al., 1994; Cavanaugh et al., 1996), further investigation into how OTRs can be embedded into science lessons is especially important. Larger-scale studies are also needed to examine patterns across more diverse classrooms and to

identify what practices are most effective in ensuring equitable participation. Experimental and longitudinal studies could be utilized to further clarify the extent to which increased frequency and variety of OTRs affect long-term academic outcomes for students with LD.

CONCLUSION

This study set out to explore how OTRs can be used to improve outcomes for K–12 students with LD. The findings revealed that students with LD often receive fewer and less variety in opportunities to engage with instruction compared to their peers. This limited access may have a direct impact on engagement and understanding of instructional content. By increasing both the frequency and variety of OTRs, teachers can help foster a more inclusive learning environment for students with LD.

The results reinforce that OTRs are important in promoting engagement and improving learning outcomes for students. However, this study also highlights that the success of OTR implementation depends on teacher intentionality. Without intentional planning, students with LD may continue to experience fewer opportunities to demonstrate their understanding and actively engage in lessons.

While this research was limited in scope, it contributes to a growing body of evidence emphasizing the importance of instructional equity. Future studies should expand on this and other existing works by examining OTR use across different grade levels and subjects. Furthermore, continued research and teacher training focused on equitable OTR practices can help ensure that all students have meaningful opportunities to learn and respond.

Ultimately, increasing OTRs is not just a strategy for improving academic outcomes, but rather serves as a commitment to inclusion. By intentionally providing more chances for students

with LD to respond, they help build classrooms where participation and engagement becomes a shared experience among students.

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