



Findings and Results of Root Cause Analysis for Comprehensive Support and Improvement Schools

Matthew A. Henson Elementary

September, 2019



COLLEGE OF
EDUCATION

CENTER FOR EDUCATIONAL
INNOVATION AND IMPROVEMENT



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This report was prepared by the University of Maryland College Park Center for Educational Innovation and Improvement at the College of Education and in partnership with the Bowie State University College of Education and the

Morgan State University School of Education & Urban Studies. The Root Cause Analysis process was facilitated by Jane Ehrenfeld and Daniel Russell, who also co-authored this report.

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I. INTRODUCTION

The purpose of this report is to share the outcomes of a Root Cause Analysis (RCA) conducted to support Matthew A. Henson Elementary School in identifying underlying causes of school performance problems. The report provides an overview of the RCA process, school profile, problem statement, root cause analysis and recommendations to address the root causes.

The Maryland Every Student Succeeds Act (ESSA) Consolidated State Plan requires schools that have been identified for comprehensive support and improvement (CSI) engage in a root cause analysis process facilitated by a third party. CSI schools are the lowest achieving five percent of Title I schools; high schools that do not graduate one third or more of their students; or schools that have federal school improvement grants (SIG). Matthew A. Henson Elementary School was identified as a CSI school as one of the lowest achieving 5 percent of Title I schools. Outcomes of the root cause analysis must be used to inform the development of intervention plans to improve school performance.

CSI schools that were identified in the 2018-2019 school year have three years to exit CSI status. CSI school leaders will receive a leadership coach to support the development and implementation of the intervention plan. CSI principals are also required to participate in the Leading for School Improvement Institute which provides customized professional learning experiences to support school improvement. CSI principals are also required to engage in monitoring visits by the Maryland State Department of Education (MSDE) to ensure that progress is being made toward school improvement goals.

MSDE established a memorandum of understanding with the University of Maryland College Park to facilitate the RCA process. The University of Maryland College Park collaborated with the American Institutes for Research (AIR) to develop RCA tools and train field teams. Field teams consisted of researchers, data analysts, and education practitioners from Morgan State University, Johns Hopkins University, Bowie State University, and other organizations. Field team members worked with all CSI schools to go through an RCA process. MSDE will support each school to engage in a long-term continuous improvement process that includes RCA analyses, recommended interventions, and evaluations of employed interventions. As part of this process, CSI schools were first required to go through a needs-assessment process that was used to drive the RCA work.

I. INTRODUCTION

RCA Process for CSI Schools

A Root Cause Analysis Facilitator Guide was developed to promote consistency in the root cause analysis process. The Facilitator Guide contains protocols designed to engage school leaders and stakeholders in identifying a specific problem and prioritizing root causes for the problem.

There was a four-step process used to facilitate the root cause analysis:

1. Craft a Problem Statement Based on Data
2. Brainstorm Causal Factors
3. Analyze Underlying Causes to Identify Root Causes
4. Prioritize Root Causes for Intervention

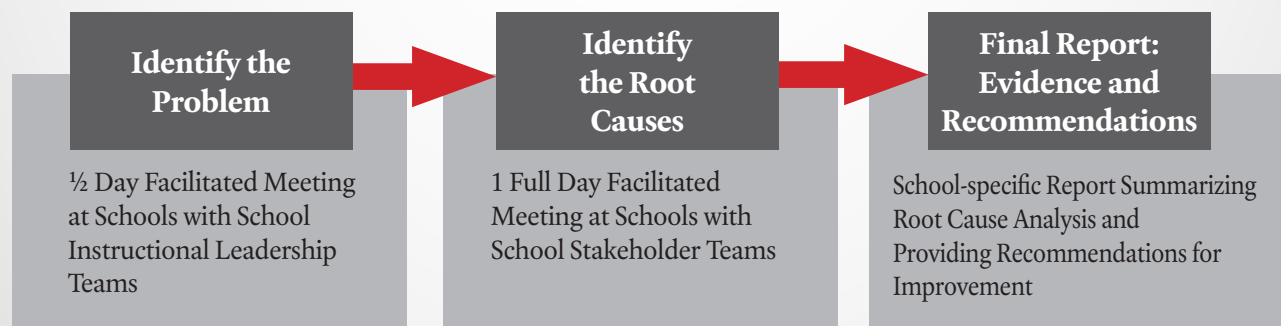
The root cause analysis process translates the successes and challenges identified through the CSI needs assessment into priorities to inform actionable improvement planning. The work with schools was staged in three steps: 1) identify

the problem; 2) identify the root causes; 3) draft a school report with recommendations for improvement.

First, the RCA team worked with school leadership teams to craft a problem statement in a half-day meeting. Using the available school, school system, and state data, the school team selected a problem that relates to their CSI status and provides a direction for the root cause analysis.

Second, the facilitators returned to the school for a full-day meeting with the school's stakeholder team to better understand the root causes of the problem. Once the stakeholders worked through the process of determining the root causes, they prioritized those root causes based on importance, feasibility, and alignment to CSI status.

As a third and final step, the RCA teams created these school-specific reports with recommendations for addressing the problem and root causes in improvement planning.



I. INTRODUCTION

An RCA starts with asking the question: What problem do we face that, if solved or mitigated, would most effectively lead to our desired outcomes (in this case significant improvement in student outcomes that would lead to the school being removed from CSI status)? This “Problem Statement” is then studied and interrogated by a team of stakeholders through the RCA process that answers questions such as:

- Why do we get these outcomes?
- Who are the people involved in this problem?
- What policies, procedures, or rules contribute to this problem?
- What resources are currently engaging with this problem?
- What environmental issues impact this problem?

This process led to a small number of “root causes” to the problem designed to help school stakeholders design strategies and programs that are more likely to lead to significant improvement for students. In addition, the process will include conducting research on the problem and prioritized root causes and recommending evidence-based strategies for improvement.

II. SCHOOL PROFILE

School Name: Matthew A. Henson Elementary School
 1600 N. Payson St, Baltimore, MD 21217
 (410) 396-0776

Total teachers: 21

Student Demographics								
Total Students	Asian	Black African Americans	Hispanic/Latino	White	Other	% Economically Disadvantaged	% English Learners	% Students with Disabilities
360	<10	352	<10	<10	<10	82.43%	<5%	12.97%

Matthew A. Henson Elementary School MSDE School Report Card Profile for Pre-kindergarten-5							
Academic Progress		School Quality and Student Success		Academic Achievement		Progress in Achieving English Language Proficiency	
Student Growth Percentile in Math	44	Students Not Chronically Absent	89.2%	% Proficient in Math	22.2%	% English Learners Making Progress Toward Learning English	40%
Student Growth Percentile in ELA	43			Average Performance Math	2.5		
Credit for Well Rounded Curriculum N/A	94.2%	Access to Well Rounded Curriculum	98.2%	% Proficient in ELA	31.7%		
				Average Performance ELA	2.8		
Earned Points /30:	13.8/30	Earned Points	21.8/25	Earned Points	8.0/20	Earned Points	4.0/10
Total Earned Percent:				57%			

To view this school's full report card, visit www.mdreportcard.org

III. PROBLEM STATEMENT

Description of the Process

The first step in the RCA process was to convene a half-day meeting that was facilitated by a two-member RCA team. Matthew A. Henson Elementary School convened on April 3, 2019 for day one of the RCA process. The convening included the school leadership team, consisting of a local school system leader (i.e., principal supervisor, school improvement lead) and other key school staff. The primary goal of this meeting was to craft a “Problem Statement” that would drive the root cause analysis. A Problem Statement can be defined as a statement describing a situation, issue, barrier, impediment, or challenge that a school must address to significantly improve students outcomes related particularly to those outcomes that led to the school being placed on the CSI list.

The goals of the first day were as follows: 1) to determine a problem statement to drive the analysis of the root causes, and 2) to identify stakeholders for day two of the RCA.

The primary data sources reviewed were the MSDE CSI Needs Assessment Report, the Maryland State School Report Card, and the School Climate Survey data and qualitative data from school stakeholders.

Problem Statement Criteria

Participants arrived at a problem statement by examining how CSI schools were identified; by using data to understand why the school received CSI status; by organizing data trends into themes; by evaluating the feasibility of addressing those themes; and by prioritizing addressable themes to identify the RCA area of focus. The problem statement was crafted based on the following criteria:

1. *How important is the problem to addressing our needs?*

Importance is determined by whether student outcomes will be improved, teacher efficacy is increased, and/or organizational systems will be improved.

2. *How feasible is it to address this problem?*

Feasibility is defined by the availability of adequate resources, staff, and capacity, and whether there is sufficient support and buy-in.

3. *How aligned is the problem to our needs?*

The problem statement should be related to the reason the school was identified as a CSI school. Also the school should be able to address the problem and its root causes by the effective selection and implementation of evidence-based practices.

Day One Summary

For the half-day day one meeting, the main discussion centered around two key areas: student home life and state assessment scores.

The staff discussed the trauma the students experience at home and were concerned about student ability to trust staff, especially with staff turnover. Other concerns about student home life included absences that occur because students are responsible for other siblings or have household responsibilities that interfere with their ability to get to school. Homelessness, transience, chronic hunger, and other pervasive problems were also discussed.

With respect to state assessment scores, one main concern was that the state assessments showed a decline while other assessments showed growth. Staff members raised questions about alignment between state assessments and iReady®. They also questioned how to use iReady and other assessments to effectively prepare the students for the state assessment.

III. PROBLEM STATEMENT

Key Data Themes

The group worked in smaller teams to analyze various data sources. Below are each team's key take-aways:

Data Source	Key Takeaways
Maryland State School Report Card	<ul style="list-style-type: none">• Staff turnover at tested grade levels is connected to low achievement scores.• Families are transient with high mobility. Transportation from home to school can be a challenge. Chronic absences are concentrated among children who depend on a sibling or adult to get them to school. District average is 40 percent chronically absent (Matthew A. Henson Elementary is 43 percent).
MSDE CSI Needs Assessment Report	<ul style="list-style-type: none">• Data reflects the team's concern about teacher turnover at tested grade levels.• Growth data: Data showed a reduction in scores on grade level. All groups showed some growth. Team had concerns about lack of correlation between iReady and state assessments.• Transience: Does the percentage of students tested beginning of year/ end of year reflect the same students, or, because of transience, is it a different population?• Mathematics growth data is positive.

III. PROBLEM STATEMENT

Themes Across Data Sources (Topics) (1 Being Highest Priority)	Ranking
Staff Turnover	1
Chronic Absence	2
Trauma, Homelessness, Transience, and Chronic Hunger	3
Low State Assessment Scores	4

Final Problem Statement

In grades 3-5, 95 percent of students did not score at the meets expectations or exceeds expectations levels on the state assessment in ELA.

Evidence Base for Problem Statement

This section represents a brief research summary of the evidence related to the significance and/or impact of the problem statement identified above.

Reading outcomes are hugely important for students to master. The National Assessment of Educational Progress (NAEP) is the only assessment that measures what US students know

and can do in various subjects across the nation, states, and in some urban districts. Also known as the Nation's Report Card, NAEP has provided important information about how students are performing academically since 1969. In 2017, the percentage of fourth grade students in Maryland who performed at or above the NAEP proficient level was 40 percent, and the percentage of students in Maryland who performed at or above the NAEP basic level was 69 percent. In contrast, the percentage of students in Baltimore City who performed at or above the NAEP proficient level was 13 percent in 2017, and 39 percent performed at or above the NAEP basic level. These results have real consequences for students because reading performance is strongly and significantly related to future earnings potential (Hanushek & Woessmann, 2008).

IV. ROOT CAUSE ANALYSIS OF THE PROBLEM STATEMENT

Day Two Summary

On day two, the team at Matthew A. Henson Elementary School continued to develop the themes that were discussed on day one. Because community partners also attended, the discussion covered issues around how the community and school could connect, and how the resources in the neighborhood and city could be better used to support the school.

Two main themes that emerged were schoolwide consistent and effective sharing of resources and knowledge. The team was concerned about innovations and interventions being applied inconsistently in the school. They discussed the need for strong support and feedback systems to ensure that new programs are implemented with fidelity by the whole staff. A discussion ensued about the importance of sharing knowledge and resources, both internally across teams and roles, and also with respect to knowledge and resources in the wider community.

There was significant engagement by the whole team and general consensus on the nature and scope of the challenges facing the school. One major concern was that the staff members feel that they all wear too many hats, and so

the prospect of taking on more roles, while potentially necessary, was also daunting in a context where everyone feels stretched too thin. Tension between the school and the surrounding community, as well as within the school staff, was also noted. Nevertheless, the conversation was collegial and the community members were highly engaged.

Specifically, the goals for day two included:

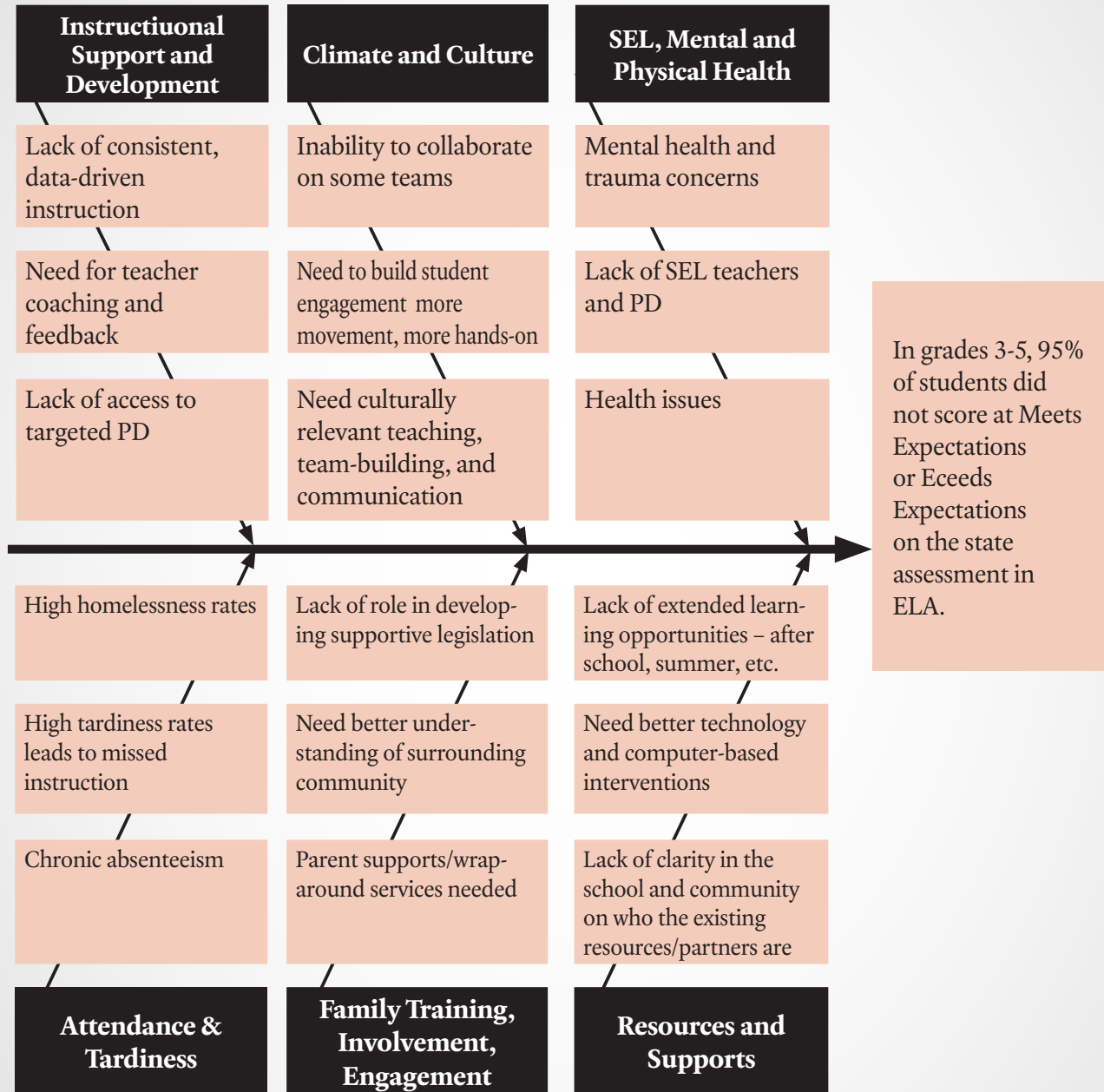
- Determining factors that contribute to the problem statement,
- Identifying underlying causes of the problem and determining which underlying causes are primary “root” causes, and
- Prioritizing the root causes based on the importance of impacting student outcomes and the feasibility of implementing strategies to address them.

Casual Factors

The “Fishbone” diagram represents the stakeholder group’s initial assessment of all of the individual factors contributing to the existence or recurrence of the problem statement.

IV. ROOT CAUSE ANALYSIS OF THE PROBLEM STATEMENT

Matthew Henson Elementary Fishbone: Exploring Causes



IV. ROOT CAUSE ANALYSIS OF THE PROBLEM STATEMENT

Prioritized Root Causes

Following several group exercises, the stakeholder group came to consensus on the priority root causes. These are the causes most critical to addressing the problem based on the criteria of importance, feasibility, and alignment.

Final Output. Prioritized Root Causes:	Ranking
Teachers do not have sufficient knowledge and capacity to differentiate ELA instruction based on the needs of each student.	1
A lack of trust amongst all stakeholders inhibits the support of student success.	2
The school lacks consistent incentives (intrinsic and extrinsic) and data analysis processes to increase student attendance.	3

Evidence Base for Prioritized Root Causes

Teacher professional learning programs are most effective when they are tailored to the individual needs of teachers. Additionally, professional learning is more effective when it is collaborative and inquiry based (centeroninstruction.org). Such collaborative structures are typically led by instructional coaches, often through professional communities of practice. Instructional coaching provides teachers with the support they need

to build collective leadership and continuously improve teacher instructional capacity and student learning. Sailors and Shanklin (2010) note that in order to raise literacy levels, schools and districts began investing in coaches to improve teaching instruction. Furthermore, Sailors and Shanklin highlight a growing body of research that points to the positive impact that instructional coaching has on improving teacher instruction on literacy and, in turn, increasing student achievement in reading.

V. RECOMMENDATIONS FOR IMPROVEMENT

Brainstormed Ideas for Improvement Planning from Stakeholders

At the conclusion of day two, the stakeholders had a brief opportunity to brainstorm ideas and strategies that might help to address the root causes identified. This brainstorming activity asked participants to list any good ideas they have. These ideas were not prioritized or identified as formal recommendations to the school.

To address ELA capacity (Root Cause #1)

- Data analysis of coaching cycle
- Dedicated instructional coach (external and internal)
- Process to identify teachers who need support; process should include progress monitoring
- Clearly defined roles and responsibilities for out-of-classroom staff
- More intentional and targeted professional learning for out-of-classroom staff
- Time for peer observations, learning walks, external observations, etc.
- Opportunities for co-teaching
- Analysis of scheduling—change it to support professional learning opportunities and communities, to provide feedback, etc.
- Site visits (Hope Academy)
- Professional learning and coaching that covers academics, instruction, and pedagogy; social emotional learning (SEL); classroom management; parent and community engagement; trauma-informed practice; etc.
- Development of consistent classroom management, SEL, and behavior routines across the whole school
- Certification for all teachers

To address partnerships (Root Cause #2)

- Team-building activities
- Off-site retreat(s) with follow-up activities
- Resource analysis and mapping
- Partner mapping (who partners are, which students and families are connected to each)
- Orientation for staff on school community and climate
- Student-advisory committee (student council, student government)
- Parent-advisory committee
- Increasing opportunities for parents to engage with school
- Volunteer opportunities
- Class parents
- Events (e.g., First Fridays)
- Connection with neighborhood association
- Peer-mediation
- Student voice, student leadership opportunities
- Consistent definition of and goals for school climate and culture (schoolwide)
- Consistent, transparent, and documented means of acknowledging and responding to concerns from all stakeholders
- Multicultural festival
- School climate committee

To address attendance (Root Cause #3)

- Incentives (e.g., attendance trophy)
- Clearer communication to address chronic absenteeism
- Process for family and student re-engagement with the school

V. RECOMMENDATIONS FOR IMPROVEMENT

RECOMMENDATION

Four Domains Domain of Rapid School Improvement¹

Use data-based decision-making to improve instruction and student achievement.

Instructional Transformation

Student performance data should be used to 1) understand the current ability levels of schools, classes, and students; 2) set improvement goals for schools, classes, and students; 3) determine strategies for accomplishing set goals; and 4) assess the effectiveness of the strategies (van Geel, Keuning, Visccher, & Fox, 2016). Using student data to drive instructional practices has the potential to increase student performance on standardized assessments when implemented under certain conditions (Carlson, Borman, & Robinson, 2011; van Geel et al., 2016). The following six research backed conditions should be taken into account:

1. Understand that implementation takes time. School and district leaders should see data-based decision-making (DBDM) as a multiyear process and should expect to see the results of effective interventions in the second and third years (van Geel et al., 2016).
2. Schools must build a culture around analyzing and using data effectively. School leaders and teachers can associate DBDM with accountability, negative judgments, and threatened job security and not with continuous improvement, which can lead to hostile environments and school cultures (Carlson et al., 2011).
3. Effective DBDM requires full collective participation of the school community (Carlson et al., 2011). Staff should actively engage in co-constructing school changes that are responsive to local school contexts (Datnow, Hubbard, & Mehan, 1998).
4. Teachers have been found to use formative assessment data to decide what content to reteach and to whom, not to fundamentally change how they teach or what curriculum they use (Goertz, Oláh, & Riggan, 2009). If fundamental instructional strategies or curriculum choices need to be changed, these must be identified and addressed as separate components of professional learning and school improvement plans.
5. The success of DBDM interventions are highly related to the quality of the inferences drawn on the basis of the data; thus, data interpretation should be performed in collaboration with multiple stakeholders, particularly during initial data review (Anderson, Leithwood, & Strauss, 2010).
6. DBDM has been shown to have greater effect on mathematics performance than it has on reading performance. Specifically, DBDM has been shown to have statistical and meaningful impact on standardized tests scores in mathematics, but empirical studies have only captured positive trends in reading performance (Carlson et al., 2011).

The Institute of Educational Sciences (IES) Regional Educational Laboratory Program (see: https://ies.ed.gov/ncee/edlabs/projects/data_use.asp) provides tools that would help the school staff adopt a data-driven culture, as well as provide tools to train staff on how to extract and analyze their data.

V. RECOMMENDATIONS FOR IMPROVEMENT

RECOMMENDATION

Four Domains Domain of Rapid School Improvement¹

Enlist parents and families as academic partners in student learning.

Culture Shift

Research has proven that family engagement matters tremendously to student academic success across all populations. Family involvement has been shown to benefit children from diverse ethnic and economic backgrounds in particular. For example, low-income African American children whose families maintained high rates of parent participation in elementary school were shown to be more likely to graduate from high school (Fantuzzo, McWayne, Perry, & Childs, 2004; Krieder, 2006).

In order to enlist parents as academic partners, schools should start by providing information and training for families to support high expectations for their children’s education. These shared academic expectations for children’s education should be rooted in the recognition of the value of education. Therefore, schools that are effective in partnering with parents actively invite parents to team with teachers and other staff in communicating and reinforcing these shared values at home as well as in school (Flamboyant Foundation, 2018).

For Elementary Schools

Evidence-based family engagement practices that support academic success and reinforce high academic expectations include parents reading regularly at home with their children, parents regularly communicating with their children about their school experiences, and parental participation in school activities and functions (Jeynes, 2005). Home visits can foster families’ understandings of the importance of these supports. Efforts should also acknowledge and integrate the funds of knowledge of student’s families into the school environment (Wilder, 2014; Mapp & Kuttner, 2013).

¹The MSDE uses the Center on School Turnaround at WestEd’s Four Domains for Rapid School Improvement: A Systems Framework as a framework for continuous improvement. The framework identifies four areas as central to rapid and significant improvement: turnaround leadership, talent development, instructional transformation, and culture shift. The recommendations in this report are aligned to the four domains as a way to organize and frame the improvement efforts. For more information: <https://centeronschoolturnaround.org>.

V. RECOMMENDATIONS FOR IMPROVEMENT

RECOMMENDATION

Four Domains Domain of Rapid School Improvement¹

Provide strong literacy instruction in ELA courses and across the curriculum.

Instructional Transformation

Research suggests that for students to become fluent readers, they need to build both foundational reading skills and comprehension skills.

Key components for improving reading skills include:

- Explicit instruction of academic language
- Instruction on decoding words, word parts, and letter sounds
- Reading multiple sentences daily
- Use of reading comprehension strategies
- Use of textual organizational structures
- Engaging and context rich setting for reading

(National Reading Panel, 2000; Foorman et al., 2016; Shanahan et al., 2010)

The instruction of reading must extend beyond the language arts classroom or lesson. Teaching students the function and structure of language as they are used in multiple content areas and domains is also part of a robust literacy program. Although this focus has typically been concentrated on the secondary level, building an early foundation for literacy in the content areas is important for future success in multiple subjects (Moss, 2005).

VI. CONCLUSION AND NEXT STEPS

Collaboratively with the Local School System (LSS) and stakeholders, Comprehensive Support and Improvement (CSI) school teams will develop intervention plans that identify SMART (Specific, Measurable, Achievable, Realistic, Time-bound) intervention goals with measurable annual outcomes and progress indicators that will guide schools toward meeting annual targets and exit criteria in three years. The outcomes of the root cause analysis must be used to inform the development of the SMART intervention goals and identification

of evidence-based strategies included in the intervention plan. Any evidence-based strategy must meet the Every Student Succeeds Act (ESSA) evidence requirements (level 1, 2, or 3). Intervention Plans will be approved by the school, LSS, and the Maryland State Department of Education (MSDE), and monitored annually by staff from the LSS and the MSDE. Additional information and resources are available on the MSDE Resource Hub. <https://www.marylandresourcehub.com/>

APPENDICES

Appendix A: List of Stakeholders

	Name	Position
Day 1	Tyra Gaither	<i>Student Support</i>
	Aaron Bush	<i>Physical Education/Health</i>
	Nicole Burda	<i>Kindergarten Teacher</i>
	G. Travis Miller	<i>Principal</i>
	Kendra Page	<i>Assistant Principal</i>
	Lisa Donmoyer	<i>Staff Specialist, Title I Office Baltimore City Public Schools (BCPS)</i>
	Mack Jones	<i>School Turnaround Specialist</i>
	Nicole Wilson	<i>First Grade Teacher</i>
	Shana Barnes	<i>Teacher/Reading Intervention</i>
Day 2		
	Name	Position
	Doc Cheatham	<i>President, Matthew A. Henson Neighborhood Association</i>
	Tanya Harcum	<i>Para Educator, Baltimore Teachers Union (BTU)</i>
	Tyra Gaither	<i>Representative</i>
	Megan Prutzer	<i>Student Support</i>
	Kendra Paige	<i>Fourth Grade General Educator</i>
	Joni Holifield	<i>Assistant Principal</i>
	Ranga Atapatiu	<i>Community Partner</i>
	Margaret Powell	<i>School Psychologist</i>
	Thomas Burk	<i>Community Partner</i>
	Sonya Goodwyn	<i>BTU Representative</i>
	Lisa Donmoyer	<i>Instructional Leadership Executive Director</i>
	Amber Clemmons	<i>Staff Specialist, Title I Office BCPS</i>
Aaron Bush	<i>Literacy Academic Content Lead</i>	
Michelle Friend	<i>Physical Education/Health</i>	
	<i>Third Grade Math/Academic Planning Facilitator</i>	

APPENDICES

Appendix B: Bios of Facilitators

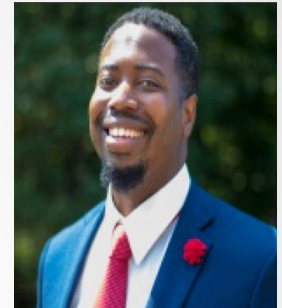
Jane Dimyan Ehrenfeld

is an educator and attorney with a decade of teaching experience in the classroom. She began her career as an elementary school teacher in the Prince George's County Public Schools, and taught elementary school as well in the Boston Public Schools. Most recently she served as the Executive Director of the Center for Inspired Teaching, a Washington, DC-based nonprofit dedicated to helping teachers create authentically engaging, playful classrooms for their students. Between 2010 and 2016, Jane was a board member, vice chair, and chair of the board of directors of the Maya Angelou Public Charter Schools. Jane's classroom was the focus of Jonathan Kozol's 2007 book, *Letters to a Young Teacher*. She has also published education-related essays in a number of publications. In 2009, Jane received her JD, magna cum laude, from Georgetown University Law Center, where she was a Public Interest Law Scholar. Following law school, she served as Deputy Director of the Georgetown Center on Poverty, Inequality, and Public Policy; clerked for The Honorable Judith W. Rogers on the United States Court of Appeals for the District of Columbia Circuit; and served as an attorney in the Office for Civil Rights at the US Department of Education. Jane is a graduate of Swarthmore College, and holds a Master's Degree in Anthropology and Education from Teachers College, Columbia University. Jane and her husband Michael reside in Silver Spring, MD, and are the proud parents of three daughters. Their two school-age children are students in the Maryland public schools.



Daniel Russell

is an educational leader with twenty years of experience in the K-12 and post-secondary arena. He regularly engages with school and district leaders to develop and deliver a customized set of research-based activities to drive school improvement.



In various roles he has provided leadership coaching and school transformation support to numerous school districts. Daniel successfully led turnaround efforts in a network of underperforming schools using evidence-based strategies as an Executive Director with The Johns Hopkins University School of Education. This work included efforts to maximize the impact of more than \$10 million in annual grant funds by operationalizing a system-wide socioeconomic community outreach and integration campaign. During his tenure, he was an advisory board member and contributor to President Obama's "My Brother's Keeper" initiative helping to lead the implementation and evaluation work in New York City Public Schools. He also worked with the Baltimore City Mayor's Office of Employee Development and Baltimore City Public Schools supporting the successful implementation of a pilot workforce development initiative. Daniel works directly with principals, school district leaders, higher education practitioners, and their leadership teams to help them define ambitious goals, manage for execution, implement rigorous "people practices," build capacity, and strengthen competencies in areas of need. He has trained and supported leadership teams in Boston; New York City; Philadelphia; New Jersey; Baltimore; Washington, DC; the US Virgin Islands; and Guam. Daniel is a recipient of The Johns Hopkins University Kevin Cuffie "Above and Beyond" Award and received an official citation from the Baltimore City Mayor's Office for excellence in education. Daniel has a Master's Degree in School District Leadership and is a member of The Harvard Graduate School of Education's Scaling for Impact cohort. Daniel began his career as a high school Spanish teacher in Baltimore City, where he was recognized as "Teacher of the Year." He continues to serve as an advocate for youth and a champion for education reform.

APPENDICES

Appendix C: Citations of research

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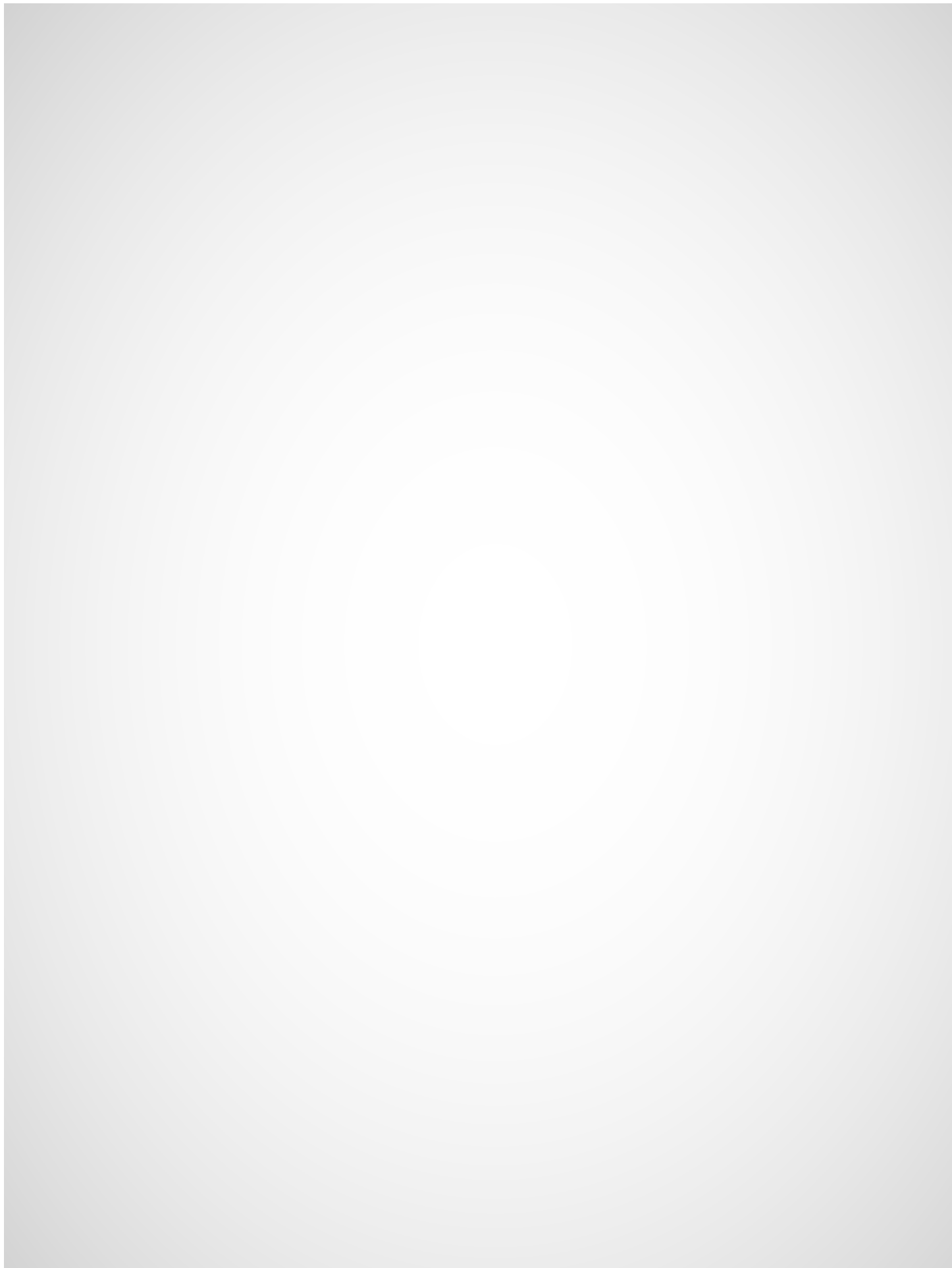
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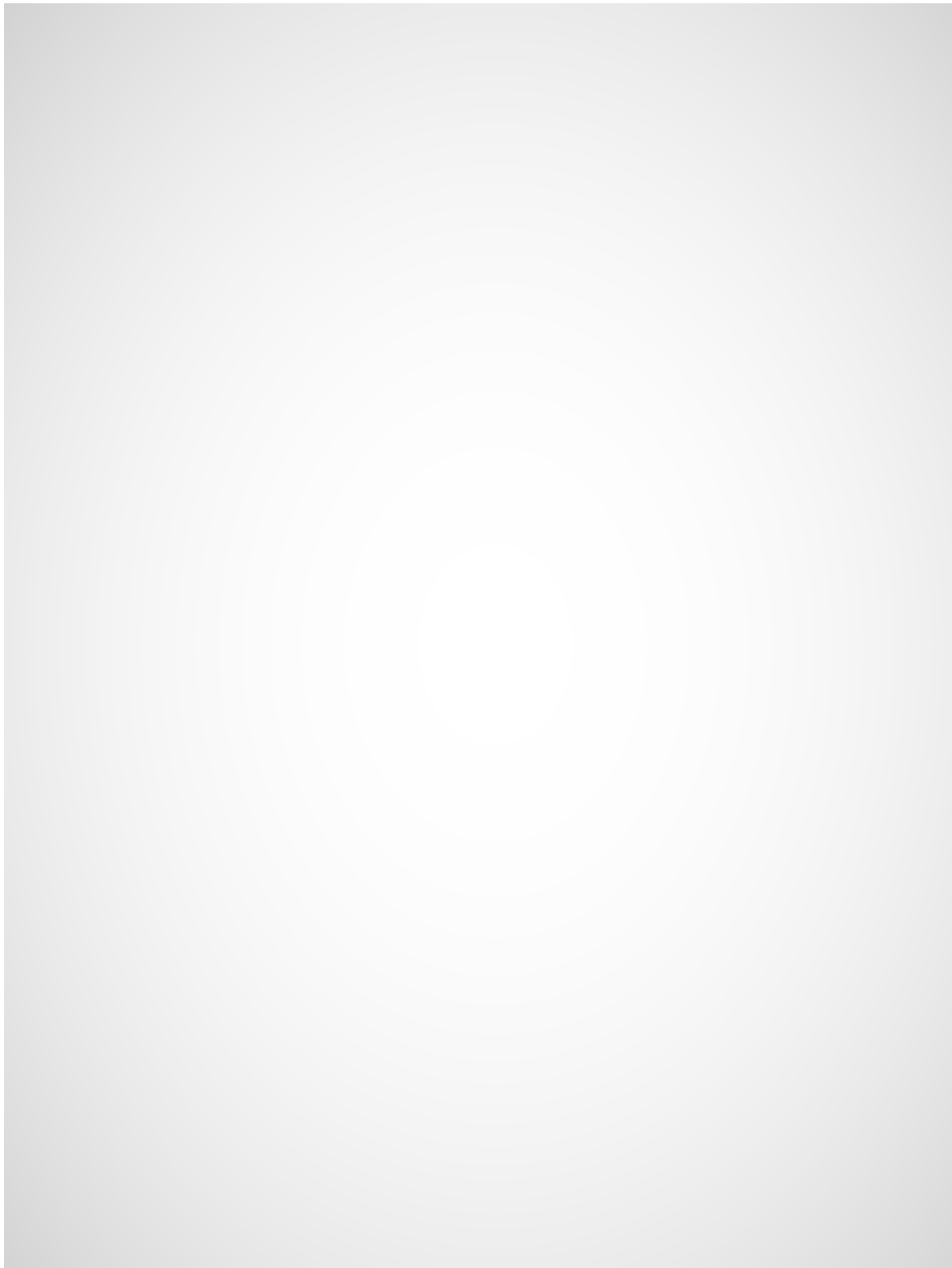
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APPENDICES

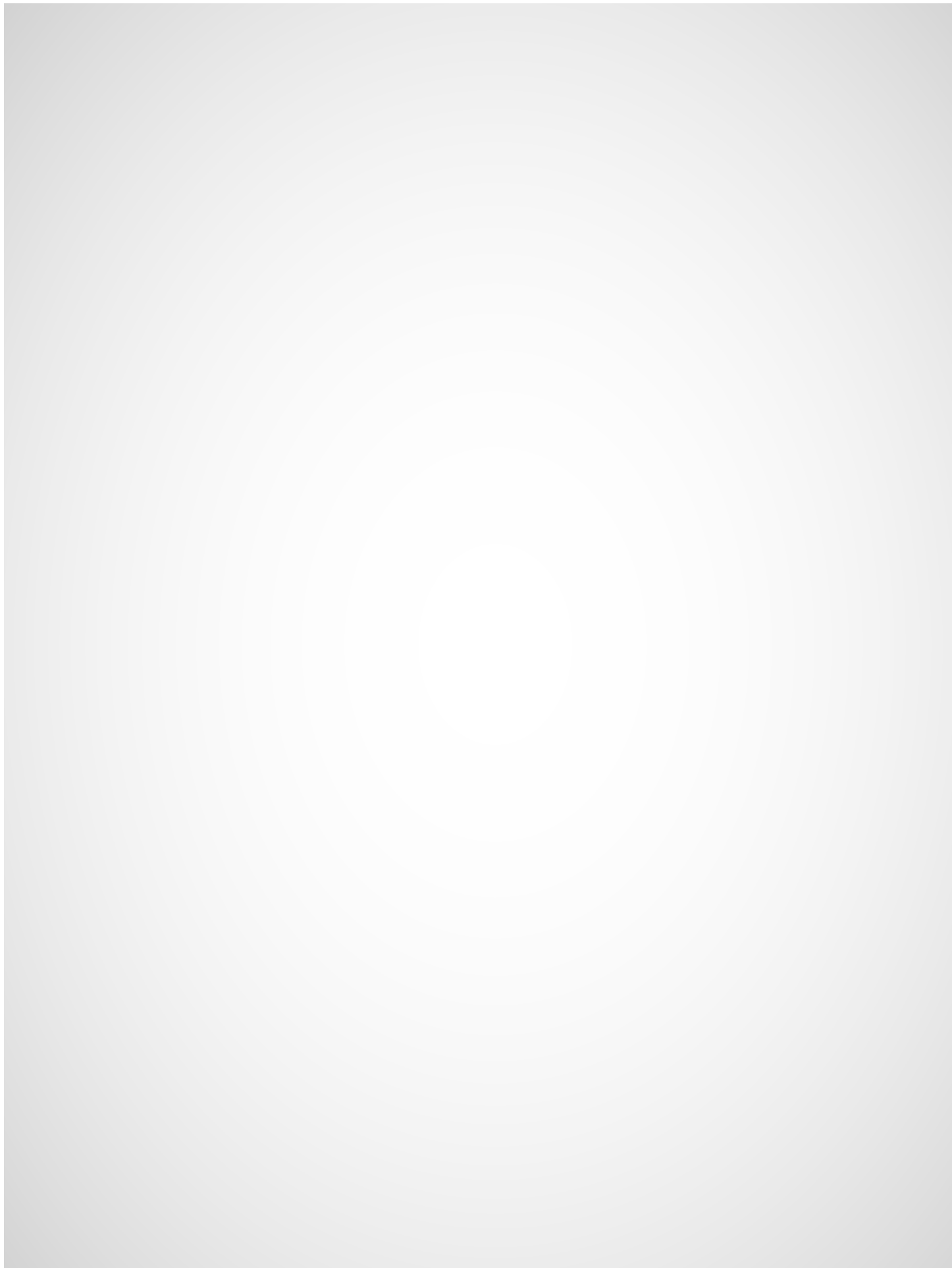




The first part of the text discusses the importance of maintaining accurate records in a laboratory setting. It emphasizes the need for clear labeling and organization of samples and equipment. The author notes that proper record-keeping is essential for ensuring the reliability and reproducibility of experimental results. This section also touches upon the importance of safety protocols and the role of documentation in incident investigations.

The second part of the text delves into the specifics of data collection and analysis. It describes various methods for gathering data, including direct observation, interviews, and the use of specialized instruments. The author highlights the importance of using standardized procedures to ensure consistency across different experiments and researchers. This section also discusses the challenges of data management, such as handling large volumes of information and ensuring its long-term storage and accessibility.

The final part of the text focuses on the interpretation and communication of results. It discusses the importance of critical thinking and the ability to identify patterns and trends in the data. The author emphasizes the need for transparency in reporting findings, including the inclusion of limitations and potential sources of error. This section also touches upon the importance of effective communication skills, both in writing and in presenting research findings to a wider audience.



The first part of the text discusses the importance of maintaining accurate records in a laboratory setting. It emphasizes the need for clear labeling and organization of samples and equipment. The author notes that proper record-keeping is essential for ensuring the reliability and reproducibility of experimental results. This section also touches upon the importance of safety protocols and the role of documentation in identifying and preventing accidents.

The second part of the text delves into the specific challenges of data management in a research environment. It highlights the volume of data generated by modern experiments and the need for efficient storage and retrieval systems. The author discusses various software solutions and hardware configurations that can help researchers manage their data effectively. Additionally, the text addresses the issue of data security and the importance of protecting sensitive information from unauthorized access.

In the final section, the author provides practical advice for researchers on how to integrate record-keeping and data management into their daily workflow. This includes suggestions for creating standardized templates and protocols, as well as tips for staying organized and up-to-date. The author concludes by emphasizing that while these tasks may seem tedious, they are crucial for the success of any scientific endeavor.

