

## K-12 schools' campus, food service, and transportation directors' COVID-19 and current challenges

G. S. Prakasha<sup>1</sup>, Trent Grundmeyer<sup>2</sup>, Sivaselwam Arulnesan<sup>1</sup>, S. Thirumalesha<sup>3</sup>, C. S. Gururaja<sup>4</sup>

<sup>1</sup>School of Education, Christ University, Bengaluru, India

<sup>2</sup>School of Education, Buena Vista University, Storm Lake, United States

<sup>3</sup>Department of Education, Mount Carmel College, Bengaluru, India

<sup>4</sup>Department of Education, Central University of Kashmir, Srinagar, India

### Article Info

#### Article history:

Received Sep 21, 2024

Revised Jun 8, 2025

Accepted Jul 19, 2025

#### Keywords:

Barriers and resources  
K-12 education  
Midwestern United States  
School directors  
School superintendents

### ABSTRACT

This study examines the COVID-19 experiences of K-12 school campus directors, especially in terms of building and grounds, transportation, and food services from the Midwestern United States. The COVID-19 pandemic has changed to online education mode and implemented safety protocols to ensure equitable access to K-12 education. School directors play a crucial role in United States's school administration. The researchers used a mixed method research design and purposive sampling. The sample included 9 school-grounds directors, 34 food service directors, and 31 transportation directors. A 5-point Likert-type questionnaire was prepared by the researchers to collect the relevant data for the study. The data were analyzed using descriptive statistics and thematic analysis. While revealing their experiences, various school directors mentioned that key challenges are reliable sources of information for them to work, inequities in resource allocation, finance allocation, and lack of professional training. The survey highlighted the need for several resources, including federal and state funding, teacher professional development programs, and community partnerships that support K-12 education. School directors addressed challenges regarding transportation, buildings, grounds, and food services during COVID-19. The study revealed the need for systemic policy changes and communication resources to create resilient and adaptive learning environments for K-12 education. Eventually, the study recommended that policymakers and educational leaders bring changes to K-12 infrastructure to withstand crises like COVID-19.

*This is an open-access article under the [CC BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license.*



### Corresponding Author:

G. S. Prakasha  
School of Education, Christ University  
Bengaluru, Karnataka 560029, India  
Email: prakasha.gs@christuniversity.in

## 1. INTRODUCTION

Leading a school district cannot entirely fall in the lap of a district administration. Directors in key areas such as maintenance, food service, and transportation were often underappreciated before the pandemic. Post-pandemic, most people in these roles were praised for their time and efforts in serving the district [1]. Many district directors were not asked to do things for the district they were trained for or had previous experiences with. This raises the question of how these K-12 directors stay current and what resources they find helpful to continue growing on the job. The conceptual framework put forth by Strange and Banning [2] posits that effective educational environments hinge on fostering a sense of inclusion, safety, engagement, and community for students and staff.

The framework is constructed around 3 key components of all human environments: i) Physical conditions, design, and layout: this pertains to the tangible features of the environment, including buildings, landscapes, and other human-made objects that interact with people using the environment, like the layout of classrooms and the cafeteria in a school district [3]. ii) Aggregate component: this component emphasizes the impact of human characteristics on the environment. It proposes that environments are influenced by the collective characteristics of the individuals who inhabit them. iii) Organizational structures: this relates to how an organization operates, achieves its goals, and allocates resources. This can range from complex, bureaucratic structures to relatively flat organizations, with their effectiveness assessed by how well they meet their end goals [1]. Strange and Banning [2] conceptual framework emphasizes the interplay between the physical, human, and organizational components in creating effective educational environments.

Despite such frameworks detailing effective educational environment, the COVID-19 pandemic had hit the functioning of school agency. There were unforeseen hurdles the school directors faced during pandemic. Therefore, the current study proposed following research questions: i) what are the obstacles faced by the Midwestern United States K-12 school superintendents and various school directors during COVID-19; and ii) what are the lessons learned by K-12 school superintendents during COVID-19 and the way forward. Therefore, the current study provides the detailed account of obstacles faced by the Midwestern United States K-12 school superintendents and various school directors during COVID-19. The study further provides the possible directions to handle such future crises situation. The details included infrastructure facilities such as buildings, grounds, transportation, food services, faculty development programs, student mental health, and technological requirements for online classes. The researchers usually measure the school effectiveness out of student or teachers survey but in the current study the lived experiences of administrators are captured which provides very candid information and is an innovative approach to measure school effectiveness.

Measuring school environment from the lived experiences of school directors and district superintendents fetch researcher a valuable input. The studies pertaining COVID-19 impact on schools are mostly understood by the teachers, head of schools, and students' perspectives. Moreover, the outcome of these studies did mention much about the administrative issues that affected them. There are not enough study exploring the details of challenges that the administrators faced and due to which the consequence is. Therefore, present study shifted the focus to understand the school directors and superintendents lived challenges so that the future such crisis time may be well tackled.

## 2. LITERATURE REVIEW

Student learning and achievement are the ultimate focus of schools. Marzano and Marzano [4] identified key components that positively impact student achievement. The key components are the quality of the curriculum, instruction provided to students, and infrastructure significantly impacting student performance and learning outcomes [5]. The findings in Council of Great City Schools [6] reported the importance of reversing the cycle of deterioration in the nation's school buildings and the link between the physical school environment and student achievement outcomes. The report describes how school districts, financially squeezed over long periods, made economic decisions that reduced the most cost-effective types of maintenance work: preventive and predictive maintenance [5]. The result of those decisions "to save money" will, in the long term, increase the amount and frequency of much more expensive breakdown repair and replacement work. Their study from 2014 found that students in deteriorating school buildings score between 5 and 11 percentile points lower on standardized achievement tests than students in modern buildings. Students in non-air-conditioned buildings have been found to perform 3 to 12 percentile points lower on student achievement than those in air-conditioned buildings [5].

Strange and Banning [2] also describe 7 structural features that lead to characteristic environments from fixed to fluid. The first of the 7 components is complexity, which refers to the specialization and subunits within the system and the amount of expertise needed in the environment. The next component is centralization, which refers to how power is distributed in a setting. Production is another structural component assessed by what an organization does or produces. In times of diminished resources, low-producing units may find a need to justify their continued existence [2].

### 2.1. Strange and Banning [2] environmental model

According to various studies, the choice of schools by potential employees and students is influenced by multiple factors, including academics, extracurricular opportunities, school atmosphere, leadership attitudes, dissatisfaction with local schools, safety concerns, and convenience [2]. The environmental model encompasses these reasons in 4 environments: physical, aggregate, organizational, and socially constructed [3]. Research indicates that designing appealing learning environments in school districts leads to increased

student enrollment and improved retention rates [7]. The physical environment, including the built environment and artifacts, influences students' sense of place and can impact their performance and learning outcomes. Factors such as air quality, lighting, and acoustics have been found to affect students' and teachers' abilities to perform effectively.

The organizational environment encompasses the planned and systemic nature of schools and organizations. Bureaucracy, flexibility, and organizational priorities impact the environment's performance and efficiency. Large organizations often experience decreased flexibility and increased complexity, leading to more incredible bureaucracy and less personal interaction [8]. Parents' priorities in school choice decisions vary, with some placing importance on extracurricular activities and indirect costs while others prioritize academic quality [9]. Different school choice patterns exist between advantaged and disadvantaged families, influenced by various contextual factors [10].

Shared impressions, conversations, stories, artifacts, symbols, and rituals within a school district shape the socially constructed environment. It represents the collective subjective views and experiences of participants [5]. A supportive environment, characterized by school supportiveness, a sense of community, and opportunities for student interaction and influence, increases students' attachment to school and reduces engagement in negative behaviors. Positive relationships with caring teachers, principals, and peers and a safe and friendly environment are influential factors for parents considering open enrollment. Understanding the different environments described by Strange and Banning [2] model helps analyze the operations and challenges of K-12 public school districts. The physical environment, convenience, aggregate environment, organizational environment, and socially constructed environment all play crucial roles in shaping school choice, student experiences, and academic outcomes.

Teaching K-12 children about the environment and sustainability is environmental education's primary goal. The objectives are to augment learners' comprehension of ecological principles, foster ecological stewardship, and stimulate conscientious decision-making concerning environmental concerns [7]. The paper examines several studies showing environmental education programs' benefits, emphasizing their adaptability and the necessity for creative research methods to increase their efficacy in learning environments. Convenience, a component of the physical environment, plays a significant role in parents' and students' decisions regarding school choice. Factors such as proximity to home, availability of before and after-school care, and existing siblings attending the school influence enrollment decisions [10]. The importance of convenience is often associated with families' socioeconomic status, with higher-income families placing less value on convenience than lower-income families.

The aggregate environment, shaped by the people in a school or community, is crucial for student success and a sense of belonging [11]. Families choose schools where the student body composition aligns with their backgrounds [9]. Collaboration between parents and schools fosters family-like schools, recognizing each child's individuality and involving families in supporting students' educational experiences. Different personality types, such as realistic, investigative, artistic, social, enterprising, and conventional, influence the compatibility between individuals and the social environment of a school district [12]. Academic factors are often a primary consideration for parents when choosing schools [13], with higher-educated parents valuing educational opportunities more than lower-income or less-educated parents [14].

## **2.2. Role of K-12 schools superintendents**

According to Kim and Weiner [15], this suggests that superintendents influence these dynamics through their policies and support for school leaders. Their role is crucial in balancing organizational and individual demands for effective school management. Supervisors play an essential role in educational research by facilitating the implementation of findings in schools [16]. They help principals develop instructional leadership and align district policies with research-based practices [17].

Superintendents, along with school management levels. They manage their interactions, which affect community capacity and local authority [18]. Through a cooperative understanding of duties and responsibilities, they play an essential role in academic management, influencing team-supervisor interactions and ultimately enabling student achievement [19]. Although their influence on enrollment and spending is modest, the study shows that school principals play a critical role in district leadership, impacting management abilities and overall school success [20].

Supervisors are responsible for personnel management, policy implementation, and district operations of schools. Although admitting their jobs have become more complex, many express great satisfactions [21]. However, Jackson et al. emphasize that political and work-related stress significantly determines whether they consider leaving their jobs [22]. School superintendents are essential in supporting student health by managing school health activities and regulations [23]. These help to strengthen the resources of schools. They work with various partners to promote methods that increase nutrition and physical activity to improve student health outcomes [24].

### 2.3. Education learning environments

Indoor classroom settings significantly impact learning, defined by air quality, temperature, and building upkeep [25]. These issues impact pupils' health and academic performance; thus, school administrators must consider them [26]. Knowing how students learn in visual settings in the classroom is essential. In this case, the benefits of visualization for students are significant [27]. They have a major impact on reading success, especially for students from diverse backgrounds who can identify their academic quality [28].

Effective online K-12 education includes educated educators, technology access, and students' ability to self-regulate learning [29]. Essential instructional methods include evidence-based curriculum design, active learning, and real-time assessment [30]. Thus, the quality of subsequent educational environments determines the long-term success of early education initiatives such as preschool [31]. However, current methods for measuring these interactions reveal fewer tangible impacts, emphasizing the need for new research tactics [32].

In a school, pleasant, warm, and harmonious learning spaces with ergonomic furniture and adequate lighting and ventilation significantly improve student and teacher performance, satisfaction, and well-being. Integration of indoor and outdoor learning areas is effective [33]. In American schools, peer relationships are valued based on social elements such as safety and teacher support [34]. According to Wilkins *et al.* [13] longitudinal research indicates that a sense of community affects social and emotional outcomes. Creating meaningful learning experiences at school and actively fostering solid relationships can significantly improve the sense of community [35].

### 2.4. Theoretical framework

The situational leadership theory guides the present study. District school superintendents and K-12 school campus directors, transportation directors, and food service directors in the Midwestern United States had adapted themselves to the changing demands of K-12 schools due to the unprecedented emergency of COVID-19. Their change in their functioning played a crucial role in continuing K-12 education amid COVID. They are expected to take the best action to make school more accessible and equitable to the students and teachers in any given situation and crisis times [36].

### 2.5. Context of the study

The study investigates how Midwestern United States K-12 school superintendents and various school directors handled obstacles and use of resources in the changing educational environment during COVID-19 and what lessons learned to handle future crises are the essence of this study. From administrators' perspectives, the study focused on infrastructure facilities such as buildings, grounds, transportation, food services, faculty development programs, student mental health, and technological requirements for online classes. The study further explored the requirement of government funding and community collaborations to enable flexible learning environments for K-12 education. Reporting school superintendents' challenges in the new normal is essential for smooth functioning of school systems in United States. The present study provides a platform to look at diverse community expectation, ensuring staff morale, and implementing state mandates to provide equitable and inclusive education in the United States.

### 2.6. Research objectives

The present study intends to address the following research objectives:

- To report the K-12 school directors' locations, outsourcing information, and resources they explore to update their working knowledge.
- To reveal the challenging experiences faced by the K-12 school directors (involved in building and grounds, transportation, and food services or nutrition) during COVID-19.
- To find out the current challenges faced by the K-12 school directors involved in building and grounds, transportation, and food services or nutrition

## 3. METHOD

The present study employed a mixed method research design to understand the experiences and challenges faced by K-12 school directors during COVID. The quantitative data collection involved a survey questionnaire. The study employed a purposive sampling technique, and accordingly, the sample consisted of the public-school building and grounds directors, nutrition or food service directors, and transportation directors from the Midwestern United States. The researchers developed a web-based survey instrument on the Google Form platform. Google Form was utilized so that participants would not have issues accessing the survey and providing feedback on computers or their cell phones since many K-12 school districts are already Google schools. In addition to collecting participants' designations, districts, and years of service,

the survey instrument consisted of an informed consent form and 9 questions. Each question has to be responded to on a 5-point Likert-type rating scale starting from strongly disagree-1 to strongly agree-5. The survey questionnaire was validated by 3 senior administrative experts from the field who provided face and content validity suggestions for the questions. It is then further processed to a pilot study on a small sample to establish reliability. The Cronbach's alpha value of the survey was found to be 0.84, indicating the study is highly reliable.

The current study and the survey design, format, and final instrument were submitted and approved by the Institutional Review Board at a University in the United States. Data collection occurred through the use of the survey. Eligible participants received a cover letter and a web email link to the survey instrument. The survey link was live and, when clicked, automatically took the participant directly to the survey instrument page. An additional follow-up email to encourage participation for those who have not completed the survey was sent approximately one week from the initial email date. The study sample included 9 public school building and grounds directors, 34 nutrition or food service directors, and 31 transportation directors in the Midwestern State of the United States. The survey was sent to around 600 K-12 directors. However, the study could get only 74 complete responses, forming the data. Figure 1 presents the sample details.

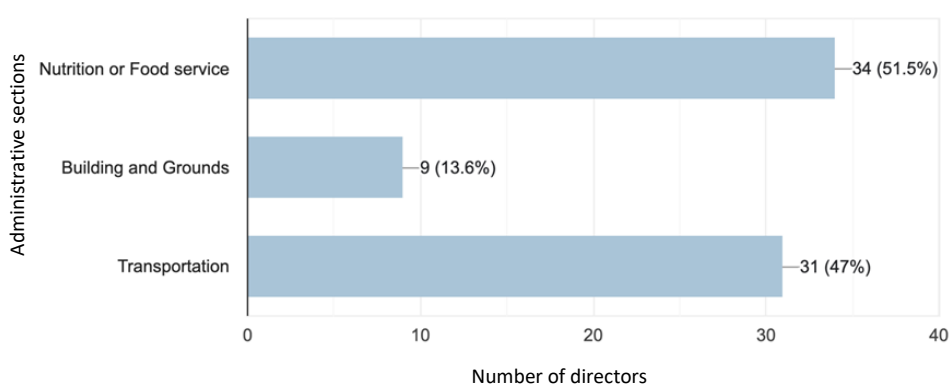


Figure 1. Shows the sample details, directors' type on the Y-axis, and number of directors on the X-axis

### 3.1. Data analysis procedures

The study collected descriptive quantitative survey data, including demographic and a few open-ended questions. Thus, the participants' responses were segregated for better interpretation. Coding is a critical step when looking for themes in open-ended survey questions. Coding helped the researcher start with numerous ideas from the data collected and eventually sort them into categories, beginning to see patterns and eventually translating them into themes or findings [37]. The themes that emerged from the open-ended question response are defined as "broad units of information that consist of several codes aggregated to form common ideas" [38]. Thematizing involves putting the information that is gathered into a smaller number of categories or themes [38]. The researcher starts analyzing open-ended textual data by reading and rereading the transcripts and coding for general themes and sub-themes from the textual data [37]. In this study, themes were analyzed both holistically and as categories of various director roles. For example, the researchers looked at all the directors' feedback for a question before breaking down the data according to the directors' roles, such as nutrition, transportation, building, and grounds.

## 4. RESULTS AND DISCUSSION

Participants who completed the survey were asked to define what type of school district they serve as part of demographic data. About 69.7% of participants described their school districts as suburban. In comparison, 9.1% served in rural districts, and another 21.2% of respondents served in urban neighborhoods. The details are depicted in Figure 2.

The researchers wondered if any directors in the study "outsource" any of their transportation, food service, or buildings and grounds services. Only ten participants responded that they outsourced services. The largest service outsourced was transportation in urban districts (50%); Figure 3 depicts its details. The study asked participants where they tend to get new information to stay updated on their jobs. Most participants said that job-specific conferences and training (47%) provide them with the latest updates on their duties. However, 25.8% of the participants reported it as webinars (25.8%), and the remaining said they got it from professional networking groups and informational websites presented in Figure 4.

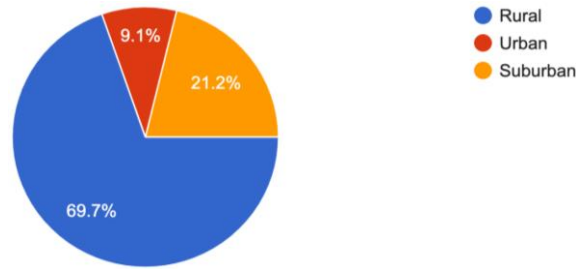


Figure 2. Type of school in the district as revealed by directors

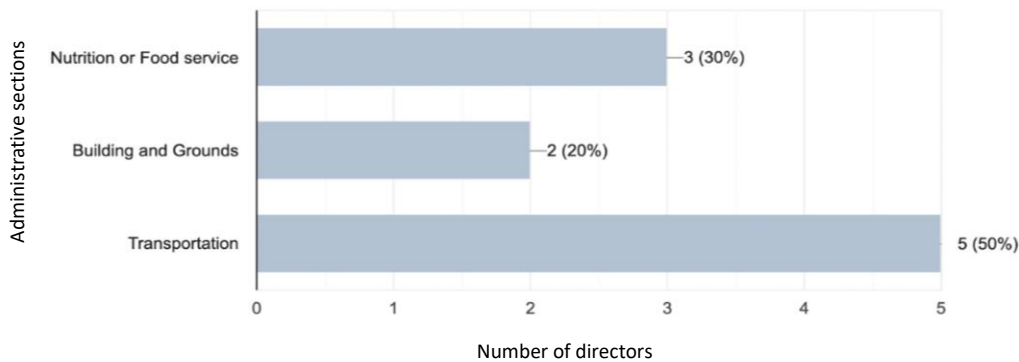


Figure 3. Participant’s responses on their transportation, food service, or buildings and grounds services

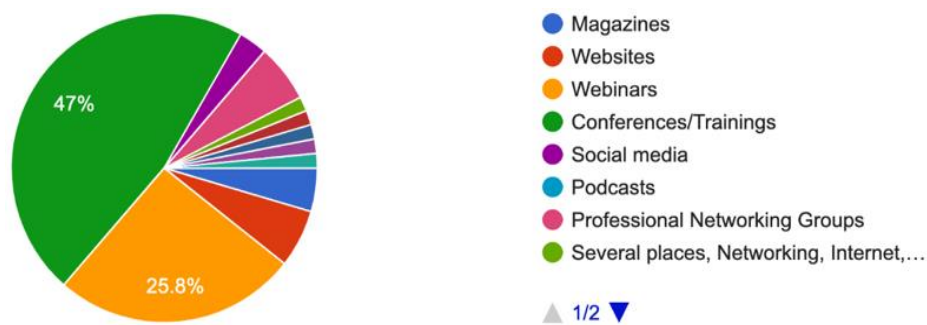


Figure 4. Shows the participants’ responses on their job update resources

**4.1. Resources that support school directors (food services and nutrition, transportation, building and grounds) in performing their duty**

**4.1.1. Food services and nutrition directors**

They cited that the primary sources of information for food are webinars and training sessions offered by the Iowa Department of Education (IDOE), the School Nutrition Association (SNA), the Institute of Child Nutrition (ICN), and the United States Department of Agriculture (USDA) [39]. Some directors said social media groups and online resources such as the IDOE website, No Kid Hungry web page, and the School Meals That Rock Facebook group were beneficial. These are the verbatims stated by the Food Services and Nutrition directors.

*“Most of the information comes directly from training with the IDOE and the Bureau of Nutrition. To stay current, I also use professional organizations like the school-nutrition association and National Child and Adult Care Food Program (CACFP) community sponsors”.*  
*“School Nutrition Association Magazine, Webinars from SNA, Department of Education, Institute of Child Nutrition, recipes from other state websites.”*

*“The state is very good at offering webinars and updates to keep the directors informed, and it is always willing to help with resources and answer questions. I also belong to SNA which offers valuable resources and training. The Child Nutrition Institute is also another wonderful source for training. The directors I have become friends with over the years offer each other suggestions, ideas, etc... on what we are doing. We are always willing to help out a fellow director.”*

#### **4.1.2. Transportation directors**

The primary source of information for transportation directors was cited as the Iowa Pupil Transportation Association (IPTA). Other sources include online networking groups, email newsletters, conferences, industry magazines, and vendor information. The directors also consult with each other and the state consultants for advice on any rule changes and innovative ideas. These are the verbatims stated by a few of the transportation directors.

*“...The Annual Transportation Conference is where I learn new things. I look forward to it every year...”*

*“...I contact our bus inspector for most of my needs, or I research it on my own...”*

#### **4.1.3. Building and grounds directors**

Building and grounds directors found the best source of information during COVID-19 was the annual conference in Des Moines, contacting other directors, and correspondence from the IDOE. Due to their busy schedules, some directors have found it challenging to have time to attend these events and utilize the resources. These are the verbatims stated by a few building and grounds directors.

*“I always like attending the yearly conference in Des Moines to see others in the same line of work and catch up.”*

*“When I need to figure something out, I check the IDOE website first and then usually go to others to get answers to my questions.”*

*“I look to other schools because I’m new to the director position, and my state lady helps me out a lot.”*

#### **4.2. COVID-19 challenging experiences shared by the school directors (food services and nutrition, transportation, building and grounds)**

The COVID-19 pandemic posed many challenges to the school’s nutrition, building and grounds, and transportation systems. This included staffing and supply chain shortages, difficulties securing food and supplies, sanitation, and even spacing on school buses to maintain social distance. In addition, it is essential to find enough drivers, ensure their safety, and avoid inconsistency and uncertainty in meal funding and menu planning. Frequent menu changes and supply chain disruptions increased health concerns for aged staff [40]. Difficulty managing amended bus routes and schedules, maintaining social distancing on buses, keeping up with ever-changing protocols and regulations, and misinformation from the media.

Participants in the study reflected on the pandemic and the different resources they utilized to serve their districts and navigate the pandemic. For many directors, asking them to reflect on the pandemic was a negative experience they did not want to remember. One food service director said, *“Meal participation had so many challenges during the pandemic and still now has a domino effect on the ups and downs of meal participation.”* The demand was very high for “free meals” offered during the pandemic by USDA, and we did not have enough staff to keep up [41]. Another building and grounds director succinctly commented, *“There were so many challenges I don’t want to even think about it again!”* Many directors shared that *“There were no clear directions”* as a major area of concern as they navigated serving their districts during the pandemic. One nutrition director pointed out, *“Getting your questions answered (was a challenge). It seemed like there were several different answers to one question.”* While a building and grounds director said similarly, *“Not having clear direction from the department of education was a real issue.”* Some challenges were made more difficult than during the pandemic now, and other challenges considerably took a new shape and progressed after the pandemic. For transportation directors, there were some unique challenges caused by the pandemic, as cited by one participant who said, *“Sticking with what the district wanted, but what we could do as drivers.”* Many others said *“finding drivers”* was and remained a consistent challenge.

There were also some pandemic-specific challenges for food service directors and others that all directors continued to face. During the pandemic, *“Trying to get food and help to hand out meals for parents to pick up”* was a new challenge. Other directors talked about many of their closed schools, but they were still expected to come to work. One participant said, *“The expectation that the district closed but food service was expected to work was a real challenge for me.”* Other challenges for food service directors remain consistent, like *“Cost and availability of food and supplies,”* which continues to be a significant challenge.

A director mentioned, *“I think the biggest challenge was the inconsistency of knowing where/how we would provide meals to students and quickly adjusting our normal practices to come up with grab-and-go menu plans.”* Also, there was an inconsistency or uncertainty of knowing how the meals would be funded with all of the changes in USDA programming to meet the needs at that time”.

#### **4.3. Training and support needed**

The survey asked participants what ongoing training or support is needed most in their area of service to their school districts now and in the future. The following sections identify the key areas of training and support that directors reported that they need, and they also offer some possible solutions to the ongoing challenges they face.

#### **4.4. Nutrition or food service directors’ ongoing challenges**

Procurement training for local and commercial products, federal guideline support, nutrition information, and food safety training, training on scratch cooking with fewer staff, new software and equipment training, networking with others in the same position and state education department, support in budgeting and supply chain management, costs, and menu planning [42]. Many participants’ comments confirmed the ongoing challenges in delivering nutrition programs in their schools. One food service director said, *“I’m hopeful for financial support from USDA over the next few years to keep up with the rising food and staffing costs. Continued training from IDOE on updates to programming and program changes.”* Others commented, *“Continued support in budgeting and supply chain shortages, costs, menu planning about meeting nutrition guidelines”* as ongoing challenges. A newer food service director noted “help with federal guidelines” as an ongoing challenge as she learns the role and serves her district.

Another major challenge is the training, support, and retention of staff. The 1 director said, *“How can we do more with less, motivate people to work for a school when they can make more money at WalMart, and deal with the USDA regulations that are moving to a far extreme where they are making food not palatable?”* Another said, *“The staff shortage is numbing, there are no subs, and we have burned out. How do we keep providing quality programs/meals when short-staffed and covering 2 positions, and how do we retain our amazing employees when they are mentally and physically burned out?”* A recent study mentioned the need for understanding reasons for teachers’ shortage [43]. It was mentioned frequently with some major concerns. A veteran food service director noted concern: *“Our biggest issue today is very low wages, especially compared to other district groups. Entry-level servers start at \$11.16. I offered a lady a full-time position with full benefits for \$11.19 and she told me that she could not work for anything less than \$15.00 an hour, which I have no control over.”* A recent study confirms that the teachers are paid less in America [44].

Other ongoing challenges mentioned by participants include training, networking, and learning about cooking methods. Representative comments include, *“My current focus/goal is on bringing local foods into our schools. There has been a huge ramp-up of training and resources on this already, but “farm to school” would still be appreciated as I learn how to properly and effectively do this.”* Another comment was, *“More opportunities to network with other directors would be great. I always learn when talking to colleagues.”* Another participant said, *“It would be nice to have small group sessions sometimes to discuss what is happening in other districts...learn and help each other.”* This is true even a decade before COVID-19, studies have reported that, school superintendents never get to speak often to discuss their contextual work problems [45].

#### **4.5. Transportation directors’ ongoing challenges**

Updates on entry-level driver training (ELDT), the portal and other updates, driver training and recruitment, recruitment, and retention of staff, which is a critical issue, training on bullying, seatbelt use, and new driver training, ELDT course for school bus drivers to satisfy current training requirements. Transportation directors across Iowa are also facing unique ongoing challenges in school districts. Post-pandemic retention of drivers and training were 2 key challenges. Once, the director discussed the challenge of recruiting and retaining drivers by saying, *“Recruitment and retention of staff is the #1 issue for every district in the state. We are running over 15% short on staffing levels, causing stress and strain on every district level. from increased student behavior issues, deferred vehicle maintenance, high absence levels and low staff morale.”* Another long-term transportation director said, *“Securing new drivers and the ability to become licensed with new Federal Guidelines is a big challenge we continue to face.”* Another said, *“Bringing on new drivers is the challenge.”* A recent study is in coherence with the driver shortage issue in America [44].

New drivers must do many things to be approved to drive. I feel our state agencies are very good at keeping us informed. One problem is they do not get the information promptly to pass on to the schools to incorporate in time and is causing us extra work as we must go back and change materials and data. A few solutions were offered by one transportation director, who said: *“I believe we need support to be focused on*



*all the new driver training that is now required.*" The federal government federal motor carrier safety administration (FMCSA), department of transportation, and department of education require hours upon hours of training for a 2 to 4-hour (split shift) part-time job. Many prospective candidates hear about all the requirements and time they will put in before ever getting behind the wheel. Bus driving was once considered a "retirement" or a "mommy" job. A small job to help the district and make a little money has become a hard-to-get license and a time-consuming process many applicants choose not to pursue. The new ELDT requirements certainly did not help us attract new drivers. The whole process must be streamlined so that one training satisfies all stakeholders [46]. Much of the process is currently redundant, with each group requiring individual testing on the same topics. This makes getting licensed an overwhelming process for any potential new driver. If the FMCSA needs class B to be just for those drivers pursuing an actual DOT job, then make a class for school buses and drop many of these requirements. A recent study agreed that the support system for drivers needs improvement [47].

Beyond hiring new drivers, the training requirements for new drivers have increased and seem challenging for transportation directors. Directors brought ELDT training multiple times. One veteran transportation director said, *"ELDT training for new drivers is the biggest reason more drivers do not start."* Another said, *"The state/federal governments should look at an ELDT course for just school bus drivers that would satisfy all the current training. The districts' cost for all the current training/testing requirements has skyrocketed in the past 3 years."* *"ELDT – requirements and availability help with training for staff to meet professional standards would be helpful to me a simplification of all the rules and make them into a simpler understanding,"* one director stated in all caps on the survey. A lot of the language is complicated and confusing. Try to make it simple. Another said, *"I would like to see Federal License Training Requirements step back. Very hard to get drivers for part-time positions because of all the training."* The training seems to change frequently and be a financial burden for districts trying to train and hire new drivers.

Another increased demand for transportation directors and drivers is related to student behaviors on the bus. One director mentioned, *"We will need more training regarding the new commercial driver's license (CDL) Laws to license drivers. Also, training for increasing behaviors with students riding buses is needed more than ever."* Another transportation director expressed similar concerns, saying, *"How to handle different forms of student behavior is something none of us is trained to do."* The student behaviors lead to drivers and directors having to contact parents in many cases. One participant said, *"Handling conversation with difficult parents is not something I thought I'd have to deal with. Parents today need you to prove their child was in the wrong before they will believe you."* As revealed by transportation directors there are number of challenges, they face such as recruiting drivers, retaining drivers, upskilling them, paying them well, student bullying, parents complain and so on. There is a need for complete support system in place to help the directors in all these areas and it is an appeal to the authority to support the matter for smooth functioning of schools.

#### **4.6. Building and grounds directors' ongoing challenges**

Safety training includes active shooter training, management training, talent retention and digitizing documentation, and understanding and handling different forms of student behavior. Building and grounds directors who responded to the study offered insightful insights into their ongoing challenges. Some of the consistent challenges include staff training and dealing with complex student behaviors. Some directors even mentioned the need for active shooter training as something they hope to get or do not get, depending on their political thoughts. One director said, *"I have employees on both sides of the active shooter side and wonder if it is only time before they expect us to be trained."* A recent study also suggested the need for active shooter training for emergency time [48].

Staff training was an ongoing challenge, directors reported. One building and grounds director said, *"New software and equipment training is ongoing for my staff."* Another said something similar: *"Keeping up with maintaining equipment and new technology is a never-ending battle in my department."* Staffing was also a common theme for many directors tasked with building and grounds work. One said, *"Just like most industries, it is difficult to find good help. I believe this will continue to get worse, and it will be even more difficult in public schools because of low wages. We can offer wonderful benefits and a wonderful retirement, but at the end of the day, a future retirement income does not pay current bills. I have had conversations with staffing companies about outsourcing our staff."* A recent study while discussing the equity director's role agrees with the current findings [49]. As revealed by directors, retaining staff, paying a decent salary, training them for upskilling has been a challenge. Therefore outsourcing the labour is an achievable strategy. Stakeholders and higher administrative authority must take care of this issue in the new-normal world.

#### **4.7. Limitations of the study**

They had the following limitations: the study sample included K-12 school directors. It was limited to the locations of demographic variables, outsourcing information, and resources they explored to update

their working knowledge. Furthermore, the study only investigated the challenges of K-12 school directors (involved in building and grounds, transportation, and food services or nutrition) during COVID-19.

## 5. CONCLUSION

This study found that all K-12 public school directors faced significant challenges during the COVID-19 pandemic. Although there were many challenges, directors in key roles played a big part in keeping students safe and fed, and this continues to be the case in public schools today. Field-specific conferences and training tend to be the best ongoing method for most directors to learn and stay current on practices in their field. Networking opportunities, websites, and webinars were also cited as helpful for directors to stay current and share resources. Recruiting and retaining a quality workforce is at the top of the ongoing challenges for all directors. Many cite pay and hours as key reasons people leave the field and take jobs outside school districts. Public schools must find a way to pay quality directors and their staff to ensure the district's operations run smoothly. There are many resources available to directors. Some are common, but most are job-specific.

The participants in this study offered some good resources worth sharing with others. While good resources are available, the challenge will be keeping resources updated promptly and delivered to directors in a format they will engage with. Based on the study participants' feedback, the researchers want to offer recommendations to school boards, superintendents, and state associations. The recommendations are awareness and knowledge of available job-specific resources, ongoing training and development, prompt professional networking, onboarding, and mentorship support for new directors. The effective operations of a K-12 school district rely on good people like any other business. This study offers good insights into the challenges food service, transportation, buildings, and grounds directors face (and will continue). The study also provides resources to stay current in their fields, benefit these key roles, and serve students best.

This study reported the challenges during the COVID-19 pandemic, available supports and resources, and future challenges for job roles, including K-12 building and grounds directors, transportation directors, and nutrition directors. There are opportunities to extend the study in multiple ways. Future research may include further studying the implications for directors of K-12 schools, specifically those specific to building and grounds, transportation, or nutrition. There is much to be learned going deeper into one field than this study's broad feedback gleaned from multiple fields. This study employed a mixed method research design. Future research may include interviews with specific directors that may extend the findings. It may be interesting to break down findings between novice and veteran directors. The recommendations may also change based on the findings that lead to specific needs for novice and veteran directors.

## ACKNOWLEDGEMENTS

Thanks to all the participants for their participation and cooperation throughout the study. We thank the University for approving the study that discusses the unique administrative aspect supporting the K-12 learning environment in the United States. This is a collaborative research work and has no grant involved.

## FUNDING INFORMATION

There is no funding involved for this research work.

## AUTHOR CONTRIBUTIONS STATEMENT

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

| Name of Author       | C | M | So | Va | Fo | I | R | D | O | E | Vi | Su | P | Fu |
|----------------------|---|---|----|----|----|---|---|---|---|---|----|----|---|----|
| G. S. Prakasha       |   | ✓ | ✓  | ✓  | ✓  | ✓ |   | ✓ | ✓ | ✓ | ✓  |    |   | ✓  |
| Trent Grundmeyer     | ✓ | ✓ |    |    | ✓  | ✓ |   | ✓ | ✓ | ✓ |    | ✓  | ✓ | ✓  |
| Sivaselwam Arulnesan |   |   | ✓  |    | ✓  |   | ✓ |   | ✓ | ✓ | ✓  |    | ✓ | ✓  |
| S. Thirumalesha      | ✓ |   |    | ✓  |    |   | ✓ |   | ✓ | ✓ | ✓  | ✓  |   | ✓  |
| C. S. Gururaja       |   | ✓ |    | ✓  |    |   | ✓ |   | ✓ | ✓ |    | ✓  |   | ✓  |

C : Conceptualization

M : Methodology

So : Software

Va : Validation

Fo : Formal analysis

I : Investigation

R : Resources

D : Data Curation

O : Writing - Original Draft

E : Writing - Review & Editing

Vi : Visualization

Su : Supervision

P : Project administration

Fu : Funding acquisition

**CONFLICT OF INTEREST STATEMENT**

All authors have agreed to the content presented in the manuscript.

**DATA AVAILABILITY**

The data of the study is available with one of the authors and may be requested through corresponding author.




**REFERENCES**

- [1] A. Wharton-Beck, C. C. Chou, C. Gilbert, B. Johnson, and M. A. Beck, "K-12 school leadership perspectives from the COVID-19 pandemic," *Policy Futures in Education*, vol. 22, no. 1, pp. 21–42, Jan. 2024, doi: 10.1177/14782103221135620.
- [2] C. C. Strange and J. H. Banning, *Designing for learning: creating campus environments for student success*. 2nd ed. San Francisco, CA: Jossey-Bass, 2015.
- [3] T. Lahey, "From college to classroom: using virtual collaborative inquiry to support first-year teachers with classroom management," *Journal of Education*, vol. 204, no. 3, pp. 499–510, Jul. 2024, doi: 10.1177/00220574231166014.
- [4] R. J. Marzano and J. S. Marzano, "The key to classroom management," *Educational Leadership*, vol. 61, no. 1, pp. 6–13, 2003.
- [5] C. Tapia-Fonllem, B. Fraijo-Sing, V. Corral-Verdugo, G. Garza-Terán, and M. Moreno-Barahona, "School environments and elementary school children's well-being in Northwestern Mexico," *Frontiers in Psychology*, vol. 11, p. 510, Mar. 2020, doi: 10.3389/fpsyg.2020.00510.
- [6] Council of Great City Schools, "Annual report 2013-2014. Urban public school system U.S.A." 2014. [Online]. Available: [https://www.cgcs.org/cms/lib/DC00001581/Centricity/Domain/16/Annual\\_Report\\_2013-14\\_Website.pdf](https://www.cgcs.org/cms/lib/DC00001581/Centricity/Domain/16/Annual_Report_2013-14_Website.pdf)
- [7] N. M. Ardoin, A. W. Bowers, N. W. Roth, and N. Holthuis, "Environmental education and K-12 student outcomes: a review and analysis of research," *The Journal of Environmental Education*, vol. 49, no. 1, pp. 1–17, Jan. 2018, doi: 10.1080/00958964.2017.1366155.
- [8] A. S. Ved and M. P. M. P. Kumar, "The factors impacting parental choice in picking non-public schools for their children," *Education and Urban Society*, vol. 53, no. 7, pp. 761–777, Sep. 2021, doi: 10.1177/0013124520966053.
- [9] J. Valant and L. H. Weixler, "Informing school-choosing families about their options: a field experiment from New Orleans," *Educational Evaluation and Policy Analysis*, vol. 44, no. 4, pp. 608–637, Dec. 2022, doi: 10.3102/01623737221086305.
- [10] S. L. Carroll et al., "Identifying the 'active ingredients' of socioeconomic disadvantage for youth outcomes in middle childhood," *Development and Psychopathology*, vol. 36, no. 2, pp. 857–865, May 2024, doi: 10.1017/S0954579423000135.
- [11] N. Cantu, D. G. Varela, D. Jones, and L. Challoo, "Factors that influence school choice: a look at parents' and school leaders' perceptions," *Research in Educational Policy and Management*, vol. 3, no. 1, pp. 19–41, May 2021, doi: 10.46303/repam.2021.2.
- [12] K. D. Arnold, "Designing for learning: creating campus environments for student success (2nd ed.) by C. Carney Strange and James H. Banning (review)," *Journal of College Student Development*, vol. 57, no. 2, pp. 224–226, Mar. 2016, doi: 10.1353/csd.2016.0019.
- [13] N. J. Wilkins, J. M. V. Verlenden, L. E. Szucs, and M. M. Johns, "Classroom management and facilitation approaches that promote school connectedness," *Journal of School Health*, vol. 93, no. 7, pp. 582–593, Jul. 2023, doi: 10.1111/josh.13279.
- [14] G. V. Prabhakar, G. S. Bhargavi, P. R. Reddy, and M. Shehab, "Influence of performance feedback and academic performance on parent–family involvement and parent satisfaction in US schools," *Journal of Community Psychology*, vol. 52, no. 1, pp. 27–38, Jan. 2024, doi: 10.1002/jcop.23083.
- [15] T. Kim and J. Weiner, "Negotiating incomplete autonomy: portraits from three school principals," *Educational Administration Quarterly*, vol. 58, no. 3, pp. 487–521, Aug. 2022, doi: 10.1177/0013161X221080374.
- [16] S. W. Lee and X. Mao, "Recruitment and selection of principals: a systematic review," *Educational Management Administration & Leadership*, vol. 51, no. 1, pp. 6–29, Jan. 2023, doi: 10.1177/1741143220969694.
- [17] L. V. Trevisan, J. H. P. P. Eustachio, B. G. Dias, W. L. Filho, and E. Á. Pedrozo, "Digital transformation towards sustainability in higher education: state-of-the-art and future research insights," *Environment, Development and Sustainability*, vol. 26, no. 2, pp. 2789–2810, Jan. 2023, doi: 10.1007/s10668-022-02874-7.
- [18] D. H. Sutherland, "Capacity and control: superintendent-school board relations in locally controlled districts," *Educational Administration Quarterly*, vol. 59, no. 3, pp. 667–699, Aug. 2023, doi: 10.1177/0013161X231159135.
- [19] D. H. Sutherland, E. McHenry-Sorber, and J. N. Willingham, "Leading rural districts: research synthesis of rural educational leaders," *Peabody Journal of Education*, vol. 98, no. 4, pp. 414–429, Aug. 2023, doi: 10.1080/0161956X.2023.2238519.
- [20] T. S. Dee, S. Loeb, and Y. Shi, "Public-sector leadership and philanthropy: the case of broad superintendents," *Educational Evaluation and Policy Analysis*, vol. 45, no. 2, pp. 220–246, Jun. 2023, doi: 10.3102/01623737221113575.
- [21] H. L. Schwartz and M. K. Diliberti, "State of the superintendent — high job satisfaction and a projected normal turnover rate: selected findings from the fifth American school district panel survey," RAND Corporation, 2022, doi: 10.7249/RRA956-12.
- [22] M. Jackson, L. Bass, S. Jackman-Ryan, K. Hoeflaken, and J. A. Picart, "Locating equity in principals' pandemic decision-making practices," *Peabody Journal of Education*, vol. 97, no. 3, pp. 274–290, May 2022, doi: 10.1080/0161956X.2022.2079883.
- [23] C. Stone-Johnson and J. Weiner, "Theorizing school leadership as a profession: a qualitative exploration of the work of school leaders," *Journal of Educational Administration*, vol. 60, no. 4, pp. 386–402, Jun. 2022, doi: 10.1108/JEA-05-2021-0112.
- [24] S. D. Hayes and M. L. Derrington, "School leadership in uncertain times: identifying dimensions of effective principal leadership," *School Leadership & Management*, vol. 43, no. 4, pp. 330–347, Aug. 2023, doi: 10.1080/13632434.2023.2171002.
- [25] S. Deng, J. Lau, Z. Wang, and P. Wargoeki, "Associations between illness-related absences and ventilation and indoor PM2.5 in elementary schools of the Midwestern United States," *Environment International*, vol. 176, p. 107944, Jun. 2023, doi: 10.1016/j.envint.2023.107944.
- [26] A. Kabirikopaei, J. Lau, J. Nord, and J. Bovaird, "Identifying the K-12 classrooms' indoor air quality factors that affect student academic performance," *Science of The Total Environment*, vol. 786, p. 147498, Sep. 2021, doi: 10.1016/j.scitotenv.2021.147498.
- [27] K. Shatri and K. Buza, "The use of visualization in teaching and learning process for developing critical thinking of students," *European Journal of Social Sciences Education and Research*, vol. 9, no. 1, pp. 71–74, Jan. 2017, doi: 10.26417/ejser.v9i1.p71-74.
- [28] M. Kuhlengel, I. Konstantzos, and C. Waters, "The effects of the visual environment on K-12 student achievement," *Buildings*, vol. 11, no. 11, p. 498, Oct. 2021, doi: 10.3390/buildings11110498.
- [29] C. C. Johnson, J. B. Walton, L. Strickler, and J. B. Elliott, "Online teaching in K-12 education in the United States: a systematic review," *Review of Educational Research*, vol. 93, no. 3, pp. 353–411, Jun. 2023, doi: 10.3102/00346543221105550.




- [30] E. Black, R. Ferdig, and L. A. Thompson, "K-12 virtual schooling, COVID-19, and student success," *JAMA Pediatrics*, vol. 175, no. 2, pp. 119–120, Feb. 2021, doi: 10.1001/jamapediatrics.2020.3800.
- [31] J. Grannäs and S. M. Stavem, "Transitions through remodelling teaching and learning environments," *Education Inquiry*, vol. 12, no. 3, pp. 266–281, Jul. 2021, doi: 10.1080/20004508.2020.1856564.
- [32] D. H. Bailey, J. M. Jenkins, and D. Alvarez-Vargas, "Complementarities between early educational intervention and later educational quality? A systematic review of the sustaining environments hypothesis," *Developmental Review*, vol. 56, p. 100910, Jun. 2020, doi: 10.1016/j.dr.2020.100910.
- [33] S. Manca, V. Cerina, V. Tobia, S. Sacchi, and F. Fornara, "The effect of school design on users' responses: a systematic review (2008–2017)," *Sustainability*, vol. 12, no. 8, p. 3453, Apr. 2020, doi: 10.3390/su12083453.
- [34] H. M. Grover, L. V. Boberiene, and S. P. Limber, "Are U.S. schools places of community? Does it matter?" *American Journal of Orthopsychiatry*, vol. 91, no. 3, pp. 332–347, 2021, doi: 10.1037/ort0000551.
- [35] M. Parker, K. Patton, L. Gonçalves, C. Liguetti, and O. Lee, "Learning communities and physical education professional development: a scoping review," *European Physical Education Review*, vol. 28, no. 2, pp. 500–518, May 2022, doi: 10.1177/1356336X211055584.
- [36] G. Thompson and R. P. Vecchio, "Situational leadership theory: a test of three versions," *The Leadership Quarterly*, vol. 20, no. 5, pp. 837–848, Oct. 2009, doi: 10.1016/j.leaqua.2009.06.014.
- [37] A. Draganova, "Book review: irving seidman, interviewing as qualitative research: a guide for researchers in education & the social sciences," *Qualitative Research*, vol. 15, no. 3, pp. 411–412, Jun. 2015, doi: 10.1177/1468794114535050.
- [38] S. Lewis, "Qualitative inquiry and research design: choosing among five approaches," *Health Promotion Practice*, vol. 16, no. 4, pp. 473–475, Jul. 2015, doi: 10.1177/1524839915580941.
- [39] J. L. Pomeranz, S. B. Cash, M. Springer, I. M. del Giudice, and D. Mozaffarian, "Opportunities to address the failure of online food retailers to ensure access to required food labelling information in the USA," *Public Health Nutrition*, vol. 25, no. 5, pp. 1375–1383, May 2022, doi: 10.1017/S1368980021004638.
- [40] S. Aday and M. S. Aday, "Impact of COVID-19 on the food supply chain," *Food Quality and Safety*, vol. 4, no. 4, pp. 167–180, Dec. 2020, doi: 10.1093/fqsafe/fyaa024.
- [41] B. L. Bennett, K. M. Gans, K. Burkholder, J. Esposito, S. W. Warykas, and M. B. Schwartz, "Distributing summer meals during a pandemic: challenges and innovations," *International Journal of Environmental Research and Public Health*, vol. 19, no. 6, p. 3167, Mar. 2022, doi: 10.3390/ijerph19063167.
- [42] J. Liu, Y. Liu, and L. Yang, "Uncovering the influence mechanism between top management support and green procurement: The effect of green training," *Journal of Cleaner Production*, vol. 251, p. 119674, Apr. 2020, doi: 10.1016/j.jclepro.2019.119674.
- [43] T. D. Nguyen, C. B. Lam, and P. Bruno, "What do we know about the extent of teacher shortages nationwide? A systematic examination of reports of U.S. teacher shortages," *AERA Open*, vol. 10, no. 1, pp. 1–18, Jan. 2024, doi: 10.1177/23328584241276512.
- [44] E. B. Singleton and T. Roberts, "The impact of teacher pay on teacher poverty: teacher shortage and economic concerns," *Current Urban Studies*, vol. 11, no. 2, pp. 289–300, 2023, doi: 10.4236/cus.2023.112015.
- [45] H. Williams, "Perceptions of rural superintendents on factors influencing employment decisions," in *Proceedings of the 2020 AERA Annual Meeting*, 2020, pp. 1–15, doi: 10.3102/1570607.
- [46] A. K. Sharma, "A comprehensive analysis of the school bus driver shortage in the United States," *Journal of Marketing & Supply Chain Management*, vol. 1, no. 3, pp. 1–9, Sep. 2022, doi: 10.47363/JMSCM/2022(1)129.
- [47] S. Hogenkamp, "Sitting at the front: school bus drivers' perceptions of bullying on the bus," in *Proceedings of the 2019 AERA Annual Meeting*, 2019, pp. 1–13, doi: 10.3102/1433892.
- [48] S. E. M. Kerr, "Managing active shooter events in schools: an introduction to emergency management," *Laws*, vol. 13, no. 4, p. 42, Jul. 2024, doi: 10.3390/laws13040042.
- [49] A. Matschiner, "A national analysis of P–12 equity director role establishment," *American Educational Research Journal*, vol. 61, no. 6, pp. 1115–1151, Dec. 2024, doi: 10.3102/00028312241269131.

## BIOGRAPHIES OF AUTHORS






**G. S. Prakasha**    is an associate professor at the School of Education, Christ University, Central Campus, Bengaluru, India. He has 20 years of teaching and research experience in Education. His research interests are teacher-education, educational-technology, teaching-learning, assessment-evaluation, and higher education. He has published research articles in peer-reviewed journals indexed in Scopus and Web of Science. He frequently conducts quantitative data-analysis workshops and delivers lectures on research and publication. He can be contacted at email: prakasha.gs@christuniversity.in.






**Trent Grundmeyer**    is an associate professor for the School of Education at Buena Vista University, United States. He earned a Specialist degree from Iowa State University in 2008, a Master's degree at Drake University in 2005, and a Bachelor's degree from Buena Vista University in 2003. His research focus includes technology adoption, parent-school communication, school law, and public-school reform. Trent teaches multiple classes in the Master's, Specialist, and Doctorate Programs, which include supervision of instruction, leadership and the profession, school law, and advanced school law. He can be contacted at email: grundmeyer@bvuu.edu.






**Sivaselwam Arulnesan**    is a research scholar at the School of Education, Christ University, Central Campus, Bengaluru, India. An individual with a keen interest in writing, creativity, and research. He earned his Bachelor of Education Honors from the Eastern University of Sri Lanka and holds a Master of Education degree from the Open University of Sri Lanka. His research interests are education management, teacher education, school education and leadership, and the sociology of education. He can be contacted at email: [sivaselwam.arulnesan@res.christuniversity.in](mailto:sivaselwam.arulnesan@res.christuniversity.in).



**S. Thirumalesha**    is an assistant professor at the Department of Education, Mount Carmel College, Autonomous, Bengaluru. He has published research articles on various aspects of Education. He has presented research papers at national and international seminars/conferences. His research interests include sociology, teacher education, educational technology, and innovative teaching and learning methods. He can be contacted at email: [thirumalesh@mccblr.edu.in](mailto:thirumalesh@mccblr.edu.in).



**C. S. Gururaja**    is an assistant professor in the Department of Education at Central University of Kashmir, Srinagar. He has published research articles on various aspects of education. He has presented research papers at national and international seminars/conferences. His research interests include teacher education, inclusive education, and innovative teaching and learning methods. He can be contacted at email: [gururaj@cukashmir.ac.in](mailto:gururaj@cukashmir.ac.in).