NEPC Review: Use of Personalized Learning Platforms in One Pandemic-Era Microshool: A Case Study and "The Most Professionally Satisfied I've Been." How Could the Best Aspects of Learning Pod Staffing Be Scaled Up? (Center on Reinventing Public Education, June 2022)

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October 2022

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Suggested Citation: Mann, B.. (2022). *NEPC review: Use of personalized learning platforms in one pandemic-era microschool: A case study* and *"The most professionally satisfied i've been." How could the best aspects of learning pod staffing be scaled up?*. Boulder, CO: National Education Policy Center. Retrieved [date] from http://nepc.colorado.edu/thinktank/models

Funding: This review was made possible in part by funding from the Great Lakes Center for Educational Research and Practice.

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Summary

Families across the U.S. experimented during the COVID-19 pandemic with new educational models in response to school closures. This review examines the Center on Reinventing Public Education's two recent reports on two related strategies that exemplify such experimentation: microschools and learning pods. The first report analyzes engagement patterns and success rates of a digital platform used at one microschool in Nevada. The second report praises learning pods' staffing features and argues that these approaches might be adopted in traditional schools. Both reports paint the new strategies in positive light. But both reports have methodological and analytical shortcomings that limit their utility for policymakers. Evidence offered in support of the strategies' overall benefits is plainly insufficient. Moreover, despite presenting inadequate evidence, the author of the second report uses it to promote school models developed by his company.

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I. Introduction

Microschools and learning pods were hot topics during COVID-19 school closures in 2020. These educational models are small gatherings of students who learn together from in-person instruction and digital technology, typically in an environment resembling a homeschool.[1] Their small-group designs appealed to parents because they limited exposure to large gatherings, keeping children safe from the virus. The models subsequently enticed education reformers who favor privatization and digitization of schooling. For example, EdChoice, a school choice advocacy group, reported excitement about learning pods, claiming that 38% of parents nationwide were participating or considering participating in a learning pod.[2] This enthusiasm could upend traditional public schools, creating a need for policymakers to understand what is—and isn't—known about these innovations.

The Center on Reinventing Public Education (CRPE) commissioned research to explore outcomes of the models and has published seven working papers as well as a summary report.[3] The reports were funded by the Chan Zuckerberg Initiative, Joyce Foundation, Michael & Susan Dell Foundation, New Schools Venture Fund, and Walton Family Foundation. This review focuses on the two most recent reports, released in June 2022. The first analyzes an online learning platform's effectiveness in a microschool, and the second details why and how learning pods' staffing lessons could apply elsewhere. The terms "learning pods" and "microschools" will be used interchangeably to match the reviewed reports' language.

In *Use of Personalized Learning Platforms in One Pandemic-Era Microschool: A Case Study*,[4] hereafter "the learning platform report," Christopher Doss and Elizabeth D. Steiner examine online learning software that microschools use to "differentiate math and/or literacy instruction so that the difficulty of the academic material is tailored to the skill level of the child."[5] The software additionally aims to help students performing at below grade level to achieve grade-level performance. The software determines these grade-level indicators for students through a diagnostic assessment. Students used the software to supplement their weekly educational activities for two to 10 hours a week. The report analyzes how many hours individual students used the software and how demographic and use pattern variables related to student outcomes. CRPE also provides a second document, a technical appendix that contains a more robust analytical discussion.

In *"The Most Professionally Satisfied I've Been." How Could the Best Aspects of Learning Pod Staffing Be Scaled Up?*,[6] hereafter "the staffing report," Bryan C. Hassel reflects on how some learning pod lessons might inform other educational settings. Most specifically, the report praises learning pod staffing features found in other CRPE reports.[7] Contrasting staffing features of learning pods and traditional public schools, the report details three differences for teachers and three for support staff. It then explains how traditional public schools can adopt the features in their post-COVID operations.

II. Findings and Conclusions of the Reports

The learning platform report provides six findings in its results section[8] and a technical appendix[9]:

1. Microschool leaders set ambitious goals and used the program more than the developer recommended.
2. Most students made substantial progress in the program.
3. Students who spent more time with the software made more progress through its content.
4. Below-grade-level students spent more time in the program and made more progress than above-grade-level students.
5. Demographic variables did not predict time or progress through the program.
6. The study has several limitations, so the report urges further research.

All six findings appear in the report, but it emphasizes findings one, two, and six through its headings. The result "[b]ased on the online platform metrics, most SNUMA [Southern Nevada Urban Micro Academy] students made substantial progress" is given its own full section, despite other results appearing in subsections or without any headings whatsoever.

The findings and framing suggest that, on the one hand, students learn in the online program. On the other hand, the report concedes that its methodological issues limit the findings' generalizability and usefulness. The report suggests examining the online program in other settings.

Rather than original research, the staffing report[10] summarizes findings from other reports and provides recommendations. The six findings are in two groups, with the first group summarizing what learning pod teachers reported:

1. Smaller student groups
2. Fewer hours with students, including part-time teaching arrangements
3. Differentiated roles in learning pods

The second set of findings describes the roles of other adults, termed "non-certified staff," in learning pods, including:

1. Tutoring and other academic support
2. Social and emotional support
3. Providing staff diversity, as these adults came from more diverse racial and cultural backgrounds than teachers

The report suggests that traditional schools should learn from reported findings and:

1. Create advanced roles for expert teachers
2. Differentiate roles among teachers and staff
3. Develop new pipelines of talent

The report provides examples of these suggestions in practice, citing Opportunity Culture designs and multi-classroom leader (MCL) models created by the author's company.[11]

The report also offers three "moves" to "scale" these staffing arrangements:

1. Clear policy barriers
2. Promote new mindsets
3. Support transitions to new structures

The report concludes with a statement about advancing research and knowledge. Suggested research areas include the report's primary focus on analysis of roles, flexibility, and time considerations.

III. The Reports' Rationale for Findings and Conclusions

To explain the program's background, the learning platform report bases its findings and conclusions on analysis of data from multiple sources, including interviews and another CRPE report.[12] Other findings are based on student data from the online platforms, including individual enrollment demographics, use patterns, and performance indicators within the program, such as badges for achieved proficiency standards.

The staffing report justifies its conclusions based on another CRPE report[13] and reports and websites from the author's organization. There is no original research; instead, this report relies on these other sources to develop conclusions and recommendations.

IV. The Reports' Use of Research Literature

The learning platform report uses four peer-reviewed research articles, a working paper, and three reports from various advocacy organizations. The microschools topic is novel to the field, so this limited use of research is not inherently problematic. However, the report could have used research in related areas to bolster its credibility, including other studies of online and digital learning.[14]

Also, the report at times struggles to define terms such as "personalized learning" and "differentiated instruction." For example, the report says, "this differentiated instruction matches the difficulty of the academic material to the skill level of the child."[15] In this example, the material was differentiated, not the instruction. While these terminology issues are not frequent enough to cause major concern, they raise questions about how the report fits into broader conversations on these topics and whether its policy recommendations align with or contradict those from past research.

The staffing report generally does not use academic literature outside of CPRE reports and reports from advocacy organizations. Government sources are mentioned a few times, and one citation of Tyack, Tobin, and Cuban's "grammar of schooling" concept appears—although the concept is mentioned only in passing and out of context.[16]

The lack of literature in the staffing report makes it difficult to trust its recommendations. Lacking original research and offering limited data to demonstrate learning pod features are worth scaling, the report needs other credible expert support. When research is unavailable on a particular topic, it is a standard scholarly practice to find related past research to understand what scholars have conceptualized, analyzed, and concluded in these related areas. For example, an abbreviated list of related areas includes class size, teacher professionalization, student wraparound supports, and appropriate parental involvement.[17]

Even if the reader finds the report's citations enough to justify action on recommendations, the omission of any discussion of research on scale is critical in a report promoting the scaling up of specific practices.The report never defines the term and hardly explains its scaling goals. Past scholarship has documented the multiple meanings of scale and explains how these definitions relate to policy recommendations. These meanings capture "depth, sustainability, spread, and shift in reform ownership."[18] Yet the report mentions no work from this robust line of inquiry on scale.

V. Review of the Reports' Methods

The learning platform report claims to be a case study, but it is unclear how the research could be classified as such. While the unit of analysis is a single microschool in Nevada, the analysis is quantitative, using descriptive statistics and regression modeling. These quantitative analyses are supplemented with two interviews. Typically, a case study includes deep analysis with several forms of data and extensive engagement with a research site.[19]

Research design typology aside, the descriptive and regression methods in the report are conducted in a technically sound manner. However, despite the technical soundness of the individual statistical tools the report uses, overarching design flaws limit the utility of the findings. The report notes these limitations but underplays them.

The overarching design has three major flaws. The first flaw is that the researchers' predictive variables are too closely linked with their outcomes. For example, one primary predictive variable is the amount of time students spent with the program, and one primary outcome variable is how much students achieve in the program. Unsurprisingly, the report shows that the more time students spend on the program, the more accomplishments (such as earning digital badges) they achieve. The report also analyzes the effect of demographic variables on outcomes. Again unsurprisingly, it finds that demographics have little predictive value, likely because time spent is the strongest predictor since it is inherently linked to the achievement outcome. An added challenge related to this critique is that the learning platforms defined student learning and grade levels, making it unclear if these concepts align with true learning and official grade level measures or if they are just internal to the software. The report concedes this limitation, saying, "We do not know, for example, if these gains will be validated by standardized assessments . . . "[20] While this concession is commendable, it underplays how this methodological limitation hinders interpreting the findings, especially since, as noted above, the report states in a section apart from the other findings, "Based on the online platform metrics, most SNUMA students made substantial progress."[21]

The second flaw is that without a comparison group or variables to control for other conditions of the microschool environment, it is impossible to disentangle the small group setting from the technology when deciding which produced positive effects. This flaw is particularly apparent because of the microschool's primary feature of small class sizes and prolonged engagement with adults. If a large school with many students tried this software, the learning platform study could not be used to justify implementation because the contexts are so different. The report mentions this flaw but underplays how fundamental it is to the study. The report says, "[t]hese descriptive results are encouraging but difficult to interpret because we do not know if the amount of time spent on the platforms was more or less effective for student learning than other educational approaches."[22]

The third flaw is that the researchers only interviewed two participants. A modest quantitative analysis and two interviews is a substandard data collection strategy for a case study. It is commendable that the report authors gained more context through interviews, but the qualitative research is too limited to provide depth of meaning. The report did not follow recommended guidance on determining when interviews are sufficient to develop valuable knowledge on a topic.[23] The report downplays this lack of participants by calling the interviews background, but then centers the interviews in the first results section and the title of the report promises "a case study."

The staffing report's methodological issues are more straightforward. The report relied on outside sources, but it did not sufficiently engage with the volume and quality of research needed to justify its claims. While relying on the past work of CRPE and the organization is a starting point, the topics the report raised have been studied in other areas of educational research and should have been incorporated.

VI. Review of the Validity of the Findings and Conclusions

The learning platform report's findings are valid but oversold. The first finding, that the school set more ambitious goals than the developer expected, does not have utility beyond helping developers adjust their goals. The second finding, that most users made substantial progress, is not helpful because the report cannot show if the finding represents genuine learning or within-platform achievements. Additionally, the finding's causes are unknown because they may relate to other features of microschools, such as small class size. Researchers should work to replicate the findings with a pre- and-post-test that demonstrates authentic learning. If replication occurs and the researchers can control for environmental factors, policymakers could begin to judge the programs positively. Another step would be to supplement the report with more qualitative research.

The staffing report is not a research report and relies on outside information. Its conclusions and recommendations are overstated. Despite relying on outside research to justify its claims, the report lacks literature on scale, learning pod programs, and related issues that education policy scholars have debated for years. These issues, as noted earlier, include class size, teacher professionalization, student wraparound support, and appropriate parental involvement. An unfortunate aspect of the report's lack of research is that some (but not all) of the report's conclusions align with other scholarship on these issues. The reader cannot trust the recommendations in the report, even if they are sufficient, because the authors do not cite outside research. This flaw is especially problematic because the report relies on and promotes programs from the author's company.

VIII. Usefulness of the Reports for Guidance of Policy and Practice

The two reports should not be used to guide policy and practice. The learning platform report is only a first step in research. While the report uses valid statistical methods, the overall research design and sample make it difficult to interpret and extend findings beyond the single case. More research is needed before policymakers act on the report's findings. The staffing report is not useful for policy and practice. The report engages with topics related to well-researched issues in education but fails to include these studies. These shortcomings are problematic because the report relies on past research to frame its discussion. This lack of depth is disappointing because the report's ideas might help address some policy issues, but it is difficult to take the report seriously since it did not engage with the overarching body of research.

Notes and References

1 National Education Association. (2020, August 25). *The proliferation of pandemic pods, micro-schools, and home education*. Washington, DC. Retrieved August 25, 2022, from https://www.nea.org/sites/default/files/2020-08/Pandemic-Pods-Report.pdf

2 Kristof, J. (2021, April). *Parents and teachers both want more learning pods*. Indianapolis, IN. Retrieved September 7, 2022, from https://www.edchoice.org/engage/parents-and-teachers-both-want-more-learning-pods/

3 The working papers are:

Jochim, A. & Poon, J. (2022, January). *Crisis breeds innovation: Pandemic pods and the future of education*. Bothell, WA: Center on Reinventing Public Education, University of Washington Bothell. Retrieved August 30, 2022, from https://crpe.org/wp-content/uploads/CRPE-Pandemic-Pods-Report_Pages_FINAL.pdf

Kim, J., Hassel, B.C., & Gilliam, P. (2022, March 2). *Equitable pandemic learning pods? A glimpse of an emerging ecosystem*. Tempe, AZ: Center on Reinventing Public Education, Arizona State University. Retrieved August 31, 2022, from https://crpe.org/wp-content/uploads/final_Pods-ecosystem-working-paper.pdf

McShane, M. & DiPerna, P. (2022, March 2). *The demand side of alternative education products*. Tempe, AZ: Center on Reinventing Public Education, Arizona State University. Retrieved August 31, 2022, from https://crpe.org/wp-content/uploads/v1-McShane-DiPerna-working-paper.pdf

Polikoff, M. (2022, March 2). *Lessons for improving curriculum from the COVID-19 pandemic*. Tempe, AZ: Center on Reinventing Public Education, Arizona State University. Retrieved August 31, 2022, from https://crpe.org/wp-content/uploads/v2-Polikoff-working-paper.pdf

Steel King, M. & Gold, T. (2022, April 11). *Pandemic pods and teaching the whole child: The role of parents and the community*. Tempe, AZ: Center on Reinventing Public Education, Arizona State University. Retrieved August 31, 2022, from https://crpe.org/wp-content/uploads/final_Whole-child-pods-working-paper.pdf

Daramola, E.J. (2022, June 15). *Progress and potential: The innovations of pandemic learning communities led by leaders of color*. Tempe, AZ: Center on Reinventing Public Education, Arizona State University. Retrieved August 31, 2022, from https://crpe.org/wp-content/uploads/final-Pods-leaders-of-color-paper.pdf

Doss, C. & Steiner, E.D. (2022, June). *Use of personalized learning platforms in one pandemic-era microschool: A case study*. Tempe, AZ: Center on Reinventing Public Education, Arizona State University. Retrieved July 30, 2022, from https://crpe.org/wp-content/uploads/final-SNUMA-report.pdf

Hassel, B.C. (2022, June). *"The most professionally satisfied I've been." How could the best aspects of learning pod staffing be scaled up*? Tempe, AZ: Center on Reinventing Public Education, Arizona State University. Retrieved July 30, 2022, from https://crpe.org/wp-content/uploads/final-Staffing-learning-pods-working-paper.pdf

4 Doss, C. & Steiner, E.D. (2022, June). *Use of personalized learning platforms in one pandemic-era microschool: A case study*. Tempe, AZ: Center on Reinventing Public Education, Arizona State University. Retrieved July 30, 2022, from https://crpe.org/wp-content/uploads/final-SNUMA-report.pdf

5 Doss, C. & Steiner, E.D. (2022, June). *Use of personalized learning platforms in one pandemic-era microschool: A case study* (p. 3). Tempe, AZ: Center on Reinventing Public Education, Arizona State University. Retrieved July 30, 2022, from https://crpe.org/wp-content/uploads/final-SNUMA-report.pdf

6 Hassel, B.C. (2022, June). *"The most professionally satisfied I've been." How could the best aspects of learning pod staffing be scaled up*? Tempe, AZ: Center on Reinventing Public Education, Arizona State University. Retrieved July 30, 2022, from https://crpe.org/wp-content/uploads/final-Staffing-learning-pods-

working-paper.pdf

7 Jochim, A. & Poon, J. (2022, January). *Crisis breeds innovation: Pandemic pods and the future of education*. Bothell, WA: Center on Reinventing Public Education, University of Washington Bothell. Retrieved August 30, 2022, from https://crpe.org/wp-content/uploads/CRPE-Pandemic-Pods-Report_Pages_FINAL.pdf

8 Doss, C. & Steiner, E.D. (2022, June). *Use of personalized learning platforms in one pandemic-era microschool: A case study* (pp. 7-12). Tempe, AZ: Center on Reinventing Public Education, Arizona State University. Retrieved July 30, 2022, from https://crpe.org/wp-content/uploads/final-SNUMA-report.pdf

9 Doss, C. & Steiner, E.D. (2022, June). *Use of personalized learning platforms in one pandemic-era microschool: A case study |Technical Appendix*. Tempe, AZ: Center on Reinventing Public Education, Arizona State University. Retrieved July 30, 2022, from https://crpe.org/wp-content/uploads/final-Appendix-SNUMA-report.pdf

10 Hassel, B.C. (2022, June). *"The most professionally satisfied I've been." How could the best aspects of learning pod staffing be scaled up?* (p. 4). Tempe, AZ: Center on Reinventing Public Education, Arizona State University. Retrieved July 30, 2022, from https://crpe.org/wp-content/uploads/final-Staffing-learning-pods-working-paper.pdf

11 The company is called Public Impact, LLC and its website is https://publicimpact.com/

12 Gilliam, P. & Kebschull Barrett, S. (2022). *Pods in action: Southern Nevada Urban Micro Academy*. Bothell, WA: Center on Reinventing Public Education, University of Washington Bothell. Retrieved September 1, 2022, from https://crpe.org/wp-content/uploads/v1-SNUMA-case-study.pdf

13 Jochim, A. & Poon, J. (2022, January). *Crisis breeds innovation: Pandemic pods and the future of education*. Bothell, WA: Center on Reinventing Public Education, University of Washington Bothell. Retrieved August 30, 2022, from https://crpe.org/wp-content/uploads/CRPE-Pandemic-Pods-Report_Pages_FINAL.pdf

14 One research area to explore focuses on how digital learning platforms have been used for remediation or by varying populations of students:

Lewis, S., Whiteside, A.L., & Dikkers, A.G. (2014). Autonomy and responsibility: Online learning as a solution for at-risk high school students. *International Journal of E-Learning & Distance Education/Revue internationale du e-learning et la formation à distance*, *29*(2), 1-11. Retrieved September 8, 2022, from https://www.ijede.ca/index.php/jde/article/view/883

Oliver, K. & Kellogg, S. (2015). Credit recovery in a virtual school: Affordances of online learning for the at-risk student. *Journal of Online Learning Research, 1*(2), 191-218. Retrieved September 8, 2022, from https://files.eric.ed.gov/fulltext/EJ1148607.pdf

Barbour, M.K. & Siko, J. (2012). Virtual schooling through the eyes of an at-risk student: A case study. *European Journal of Open, Distance and E-Learning, 15*(1), 1-14. Retrieved September 8, 2022, from https://files.eric.ed.gov/fulltext/EJ979591.pdf

Mann, B., Li, W., & Besnoy, K. (2021). Digital divides: K-12 student profiles and online learning. *Education Policy Analysis Archives, 29*(August-December). Retrieved September 1, 2022, from https://doi.org/10.14507/epaa.29.6351

Another option is wide-ranging reviews of digital and online learning platforms:

Means, B., Bakia, M., & Murphy, R. (2014). *Learning online: What research tells us about whether, when and how*. New York, NY: Routledge.

Cavanaugh, C. & Clark, T. (2007). The landscape of K-12 online learning. In P. Adamson, B. Adamson, N. Clausen-Grace (Eds.), *What works in K-12 online learning* (pp. 5-19). Eugene, OR: International Society for

Technology in Education.

Barbour, M.K. (2022). Looking back to see ahead: An analysis of K-12 distance, online, and remote learning during the pandemic. *Journal of Digital Social Research, 4*(2), 7-25. Retrieved September 1, 2022, from https://doi.org/10.33621/jdsr.v4i2.107

Saqlain, N., Mulcahy, D., & Barbour, M.K. (2020). E-Learning at the K-12 Level: An overview of the relevant literature. *i-Manager's Journal on School Educational Technology, 16*(2), 39. Retrieved September 1, 2022, from https://imanagerpublications.com/article/17590/

15 Doss, C. & Steiner, E.D. (2022, June). *Use of personalized learning platforms in one pandemic-era microschool: A case study* (p. 3). Tempe, AZ: Center on Reinventing Public Education, Arizona State University. Retrieved July 30, 2022, from https://crpe.org/wp-content/uploads/final-SNUMA-report.pdf

16 The "grammar of schooling" is a term that Tyack, Tobin, and Cuban coined in the 1990s through the following:

Tyack, D. & Tobin, W. (1994). The "grammar" of schooling: Why has it been so hard to change? *American Educational Research Journal, 31*(3), 453-479. Retrieved September 8, 2022, from https://www.jstor.org/stable/pdf/1163222.pdf

Tyack, D. & Cuban, L. (1995). *Tinkering toward utopia: A century of public school reform*. Cambridge, MA: Harvard University Press.

The concept suggests schools maintain a certain set of features, a grammar, that are difficult to change because they are deeply embedded in what makes a school a school. If a school did not have these features, it would likely not be considered legitimate by society. These features include age-graded classrooms, separation of classes by academic discipline (e.g., science, math, language arts), direct instruction, ability tracking, and sorting children by ability.

The irony with the staffing report using this citation is that scholars who align with Tyack, Tobin, and Cuban would look at the report with skepticism. The report mirrors past proclamations of where educational reformers feel they have a solution that ultimately fails to make lasting change to teaching and learning. Those past reforms struggle to change the grammar of schooling, have weak implementation addressing the periphery, or completely fail. Cuban has done extensive work critiquing enthusiastic calls by reformers in the realms of technology. See:

Cuban, L. (1993). Computers meet classroom: Classroom wins. *Teachers College Record, 95*(2), 185-210. Retrieved September 1, 2022, from https://doi.org/10.1177/016146819309500202

Cuban, L. (1990). Reforming again, again, and again. *Educational Researcher, 19*(1), 3-13. Retrieved September 1, 2022, from https://doi.org/10.3102/0013189X019001003

A better way to engage with this scholarly conversation is to start with contemporary work building on the "grammar of schooling" concept:

Mehta, J. & Datnow, A. (2020). Changing the grammar of schooling: An appraisal and a research agenda. *American Journal of Education, 126*(4), 491-498. Retrieved August 31, 2022, from https://www.journals.uchicago.edu/doi/epdf/10.1086/709960

Courtney, S. J. & Mann, B. (2021). Thinking with 'lexical' features to reconceptualize the 'grammar' of schooling: Shifting the focus from school to society. *Journal of Educational Change, 22*(3), 401-421. Retrieved August 31, 2022, from https://doi.org/10.1007/s10833-020-09400-4

The staffing report suggest solutions that hardly address grammar of schooling and falls into the traps these past scholars have explained. Mentioning one wants to change the grammar by "highlighting alternatives" to "prompt actors in the field to consider different possibilities," as the report suggests on p. 7, will not change the grammar.

17 Each of these topics have their own dedicated line of inquiry ranging from individual scholars to multiple government reports to dedicated journals. While the staffing report does not use identical terminology of these research areas, it overlaps with them. The report should have engaged with past research to situate its arguments within the broader context of scholarship. Sample publications in these areas include:

Chingos, M. (2013). Class size and student outcomes: Research and policy implications. *Journal of Policy Analysis and Management, 32*(2), 411-438. Retrieved September 1, 2022, from https://www.jstor.org/stable/pdf/42001539.pdf

Milner, R. (2013, February). *Policy reforms and the de-professionalization of teaching*. Boulder, CO. National Education Policy Center. Retrieved August 30, 2022, from https://files.eric.ed.gov/fulltext/ED544286.pdf

Eber, E, Sugai, G., & Smith, C.R. (2002). Wraparound and positive behavioral interventions and supports in the schools. *Journal of Emotional and Behavioral Disorders, 10*(3), 171-180. Retrieved September 1, 2022, from https://journals.sagepub.com/doi/pdf/10.1177/10634266020100030501

Ferrara, M. (2009). Broadening the myopic vision of parent involvement. *The School Community Journal, 19*(2), 123-142. Retrieved August 29, 2022, from https://files.eric.ed.gov/fulltext/EJ867972.pdf

Khan, M. (1996). Parental involvement in education: Possibilities and limitations. *The School Community Journal, 6*(1), 57-68. Retrieved August 29, 2022, from https://www.adi.org/journal/ss96/KhanSpring1996.pdf

Hanson, R., Pugliese, C. & Grady, S. (2020, July). *Parent and family involvement in education: 2019 – National Household Education Surveys Program*. Washington, DC. U.S. Department of Education. Retrieved September 1, 2022, from https://nces.ed.gov/pubs2020/2020076full.pdf

18 The quote is taken from Coburn's foundational work in this area:

Coburn, C.E. (2003). Rethinking scale: Moving beyond numbers to deep and lasting change. *Educational Researcher, 32*(6), 3-12. Retrieved September 1, 2022, from https://journals.sagepub.com/doi/pdf/10.3102/0013189X032006003

Coburn recently updated this work with other scholars in the field:

Morel, R.P., Coburn, C., Catterson, A.K., & Higgs, J. (2019). The multiple meanings of scale: Implications for researchers and practitioners. *Educational Researcher*, *48*(6), 369-377. Retrieved September 1, 2022, from https://journals.sagepub.com/doi/pdf/10.3102/0013189X19860531

This work has informed studies in the field that have considered how to scale educational reforms. Some helpful examples include:

McDonald, S.K., Keesler, V.A., Kauffman, N.J., & Schneider, B. (2006). Scaling-up exemplary interventions. *Educational Researcher, 35*(3), 15-24. Retrieved September 1, 2022, from https://journals.sagepub.com/doi/pdf/10.3102/0013189X035003015

Cohen-Vogel, L., Cannata, M., Rutledge, S.A., & Socol, A.R. (2016). A model of continuous improvement in high schools: A process for research, innovation design, implementation, and scale. *Teachers College Record, 118*(13), 1-26. Retrieved September 1, 2022, from https://journals.sagepub.com/doi/pdf/10.1177/016146811611801301

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