Learning Disabilities: A Contemporary Journal 18(2), 153-166, 2020

"State Standards and IEP Goals. A lot of TPT Products": What Resources Early Childhood Educators Report Using to Plan Mathematics Instruction

Corey Peltier*
Tiffany Peltier
Taylor Werthen
Andy Heuer
University of Oklahoma

Access to high-quality resources is integral for educators to provide research-aligned mathematics instruction. Identifying the supplemental resources educators use to plan mathematics instruction can inform the ways researchers and organizations disseminate research-based practices. The goal of this study was to identify the frequency in which early childhood educators (i.e., pre-Kindergarten through third grade) reported using various resources to plan for mathematics instruction. Furthermore, we investigated whether differences were observed based on teacher factors (i.e., general or special education, route to certification, years of experience) and locale (i.e., rural, urban, suburban). We retained data from 917 teachers for data analysis. The three most frequently reported resources by educators were colleagues, Teachers Pay Teachers, and Google/Yahoo. The three least frequently reported resources were the typical outlets researchers use to reach teachers: What Works Clearinghouse, Teaching Exceptional Children, and Teaching Children Mathematics. General and special education teachers differed on their self-reported usage of five resources: colleagues, Google/Yahoo, teaching blogs, Teaching Exceptional Children, and the What Works Clearinghouse. Rural educators self-reported that they were less likely than suburban educators to use colleagues or specialists at the district to plan instruction. Implications for future research and practice are discussed.

Keywords: **Early Childhood, Resources, Mathematics Instruction, Rural, Special Education**

Introduction

The mathematics performance of students in the US has received scrutiny due to data trends on national (National Center for Education Statistics, 2019) and international (Trends in International Mathematics and Science Study; Provasnik et al., 2016) assessments. This has led to debates on the best mathematics instructional methods (Ansari & Lyons, 2016). Mathematics teachers are caught in the middle; they are tasked with implementing high-quality mathematics instruction by selecting and using available resources. However, this access to resources may differentially affect rural locales (Marlow & Cooper, 2008) and special education teachers (Albrecht,

*Please send correspondence to: Corey Peltier, PhD, Assistant Professor, Department of Educational Psychology, University of Oklahoma, 820 Van Vleet Oval, Norman, Oklahoma, US 73019, United States of America, Phone: +1 401-487-0921, Email: coreypeltier@ou.edu.

Johns, Mounsteven, & Olorunda, 2009; Bishop et al., 2010; Mason-Williams, 2015). By identifying the resources teachers use to plan mathematics instruction, the field can better target dissemination efforts of research-aligned mathematics practices.

Evidence-Based Practice

The evidence-based practice (EBP) movement seems straightforward. The research field will demonstrate which practices have evidence impacting student outcomes and report these findings to relevant stakeholders. Stakeholders will buy in because these practices have been shown to impact student outcomes. However, in the words of Lee Corso, "Not so fast, my friend." Since the inception of the EBP movement in special education, this process has not been as impactful as researchers had hoped (Carnine, 1997). The process to label a practice as an EBP has been debated (Maggin et al., 2014). Currently, leading organizations in the field (e.g., *Council for Exceptional Children Standards for Evidence-Based Practices* and *What Works Clearinghouse Standards and Procedures for Evidence-Based Practice*) provide similar, but different processes for this purpose. In addition, widespread dissemination efforts have not influenced teaching decisions with many educators being unfamiliar with EBPs (Burns & Ysseldyke, 2009; Gable et al., 2012; Stormont et al., 2011). Furthermore, even when educators are familiar with EBPs, the implementation of said practices is not guaranteed; low fidelity has been identified (Harn et al., 2013) along with a resistance to implementation (Cook & Odom, 2013; Hammersley, 2007). Some have argued that conceptualizing the EBP movement in special education as a dynamic process, rather than merely the identification of individual practices, is more appropriate (Cook & Cook, 2016). A key consideration within this dynamic process is to understand the resources educators are using to plan instruction.

The Role of Adequate Resources

Teachers impact a student's behavioral and academic trajectory, for the better or worse. In order to maximize instruction, educators must have access to high-quality resources. In fact, access to resources is a key aspect affecting the working conditions for special education teachers which in turn predicts their likelihood for staying in the field (Bettini, Gilmour, Williams, & Billingsley, 2020; Billingsley & Bettini, 2019). Resources have also been shown to be an important predictor of student mathematical achievement in addition to teacher mathematical knowledge (Hill, Blazar, & Lynch, 2015). Thus, access to resources is important to improve working conditions and the ability to provide high-quality mathematics instruction. It is critical to consider not only access to resources but also the type of resources educators are using to plan for mathematics instruction. This information will aid in dissemination efforts along with in-service and pre-service teacher development on how to become a critical consumer of available resources.

To compound issues, a majority of students (i.e., 63.5%) with an identified disability under the Individuals with Disabilities Education Improvement Act (IDEIA, 2004) receive a majority of their instruction (80% or more) in a general education environment provided by a general education teacher (OSEP Annual Report, 2019). This percentage is higher for students identified with a specific learning disability (SLD), 71.6%. Research suggests special education teachers are not proficient in their understanding or implementation of EBPs in mathematics for students identified with a disability. General education teachers are less knowledgeable of EBPs for students with disabilities (e.g., Maccini & Gagnon, 2006; Stormont et al., 2011). However, the show goes on; teachers must consult available resources to extend their knowledge and plan for instruction.

Previous Literature on Teacher Resource Selection

The EBP movement has placed a high priority on training teachers in the use of EBPs for instruction. This is mandated in federal legislation, with the IDEIA (2004) stating "scientifically-based research" must be used in determining curriculum material selection and program development. The Every Student Succeeds Act (ESSA, 2015) used the term "evidence-based intervention" to specify the types of professional development and practices schools should be implementing. Fortunately, there is a substantial and growing body of literature on effective practices to improve mathematical outcomes for students with disabilities in pre-kindergarten through third grade (i.e., early childhood certification). However, if teachers did not receive training in EBPs for mathematics during their preservice preparation program, alternative certification program, or continuous professional development activities than they are left to seek out information and/or instructional materials on their own. Educators have access to an infinite amount of resources, ranging from the internet to academic journals to conversations with their colleagues. The question remains, "What resources are teachers consulting to plan for mathematics instruction?"

Opfer and colleagues (2016) surveyed over 1,000 English language arts and mathematics teachers and found that teachers mostly consulted resources not provided by their district. Pinterest and Teachers Pay Teachers were used by over 85% of elementary teachers to plan for instruction. Hott and colleagues (2019) surveyed 258 rural Texas educators who provided algebra instruction; a concerning finding was that practitioner journals were the least accessed resources as this is one of the major avenues the research community uses to disseminate information to practitioners. In addition, the Council for Exceptional Children's website was used by less than 20% of teachers. Furthermore, Hott and colleagues found that teachers used a variety of websites that are not vetted (e.g., Pinterest, Teachers Pay Teachers, Blogs, Facebook), which would increase the variability in the quality of resources students encounter. A more promising finding in that study was the National Council for Teachers of Mathematics website was used by more than 60% of teachers to plan instruction. In addition, teachers reported using colleagues and conversations with specialists in the district frequently to plan instruction.

Test and colleagues (2015) evaluated 47 educational websites purporting to promote EBPs for students with and without disabilities. The authors categorized 34% of the websites credible, 23% cautiously credible, and 43% of websites as not trustworthy. All available resources are not equally credible. These studies raise important considerations for the field.

Purpose of Current Study

The goal of the current study was to investigate the resources early childhood teachers (pre-kindergarten through third grade) report using to plan mathematics instruction. Further, we aimed to investigate whether differences were identified based on teacher demographics or locale. The following research questions guided this project.

1. What is the frequency of teachers' reported use of published curriculum, school/district/state created curriculum, curriculum posted on Teachers Pay Teachers, or self-developed curriculum?
2. What is the frequency of teachers' reported use of various resources to plan mathematics instruction?
3. Do teachers differ in their reported use of resources based on the locale of their school, teacher role (i.e., general or special education), path to certification, or years of experience?

Method

Survey Development

To identify mathematical curriculum teachers may use, we consulted prior literature and publisher websites to identify curriculum geared toward PreK through third-grade. We included an item for teachers to identify whether their school, district, or state have provided curriculum for them to use. Last, we included two additional items: (a) teachers could select other and type in the name of the curriculum used or (b) teachers could identify if they create their own curriculum and provide the names of the resources used. To identify external resources to include in our survey we purposefully selected avenues the research community uses for dissemination (i.e., practitioner journals, the What Works Clearinghouse), personnel resources teachers would have access to in school environments (i.e., colleagues, district level specialists), and web-based resources (search engines [Google, Yahoo], Pinterest, Teachers Pay Teachers, Teacher Blogs, Youtube). The draft survey was disseminated to three scholars in the field of mathematics instruction for students at-risk or identified with a disability and who engage in pre-service teacher development. The following prompts were given: (a) evaluate the instrument for clarity of directions, rating scale, language and (b) the appropriateness of the mathematical resources included on the survey. The feedback was used to revise the instrument. The following elements were revised: (a) rewording of the demographic items (i.e., highest degree in the field of education) and (b) adding teacher blogs as a resource to include.

The final survey included 13 demographic items, 7 related to the teacher and 6 related to the students they served. Teachers were asked to rate select the primary curriculum used and their use of 10 external resources to plan for mathematics instruction on the following Likert-type scale: *never heard of It* (0), *heard of it, but never* (1), *rarely* (2), *occasionally* (3), and *frequently* (4).

Participants

The target population for the current study was early childhood teachers (pre-kindergarten through third-grade) in a southwestern state who provided mathematics instruction. To recruit this population, we used a listserv provided by the State Department of Education that included email addresses associated with teachers in the state. We deleted all email addresses associated with teachers working in a middle school or high school setting.

In January 2019, the first email was sent to 23,612 email addresses. A total of 1,875 email addresses were undeliverable; this may be attributed to teachers leaving their position because the listserv is updated once a year or email addresses incorrectly entered into the database. The first recruitment email resulted in 936 teachers completing the survey and another 1,330 starting the survey but not completing it. A reminder email was sent one week later to 23,152 (email addresses were removed from those who requested); a total of 1,892 email addresses were undeliverable. The second recruitment email resulted in 508 teachers completing the survey with another 780 starting the survey but not completing it. After the two recruitment emails 1,444 teachers completed the survey. Data were retained for 917 educators who met the following criteria (a) provided mathematics instruction to children in pre-kindergarten through third grade, (b) primary role was a classroom teacher (cf., intervention specialist, Title 1 teacher), (c) completed the survey. We excluded teachers working in virtual schools. See Table 1 for full demographic information of respondents.

Table 1. ***Demographic Information of Teacher Respondents***

Variable	Frequency (Percentage)
Degree in Education	No, *n* = 36 (3.9%) Yes, *n* = 881 (96.1%)
Path to Certification	Non-Traditional, *n* = 130 (14.2%) Traditional, *n* = 787 (85.8%)
Current Position	General Education, *n* = 767 (83.6%) Special Education, *n* = 150 (16.35%)
Years of Experience	0-5 years, *n* = 289 (31.5%) 6-10 years, *n* = 200 (21.8%) 11-15 years, *n* = 142 (15.5%) 16-20 years, *n* = 111 (12.1%) 21-30 years, *n* = 175 (19.1%)
Geography	Urban, *n* = 267 (29.1%) Suburban, *n* = 278 (30.3%) Rural, *n* = 372 (40.6%)

Data Analysis

Our first research question aimed to evaluate the frequency in which teachers used a published curriculum, curriculum developed by school/district/state, published curriculum on Teachers Pay Teachers, or self-developed curriculum. Items were collapsed to report a frequency of published curriculum, curriculum provided by school/district/state, curriculum obtained from Teachers Pay Teachers, or self-developed curriculum. Our second research question address the frequency in which teachers used each external resource provided to plan for mathematics instruction. To address this research question, we computed two measures of central tendency (i.e., mean, median), one measure of dispersion (i.e., standard deviation), and the frequency of responses per Likert scale option. In addition, we provided an open response option, we coded responses and reported the frequency for the top five responses typed in. Research question 3 aimed to address whether the frequency in teacher self-reported resource usage differed by locale, role of the teacher, path to certification, and years of experience. To address these research questions, we used crosstabs to run chi-squared distribution tests to identify whether the distribution of responses were differential for each demographic variable. In addition, we reported an effect size estimate: (a) eta^2 for nominal by interval variables (i.e., locale, role of teacher, path to certification) and (b) R^2 for interval by interval variables (years of experience).

Results

What is the frequency of teachers' reported use of published curriculum, school/district/state created curriculum, curriculum posted on Teachers Pay Teachers, or self-developed curriculum?

A majority of teachers reported using a published curriculum to plan for mathematics instruction (n = 625, 68.2%). A total of 108 (11.8%) of teachers reported using a curriculum developed by their school/district/state that consisted of multiple resources and 21 (2.3%) reported using a curriculum published on Teachers Pay Teachers. Surprisingly, nearly one-fifth of teachers (n = 163, 17.8%) reported developing their own curriculum by pulling from multiple resources.

What is the frequency of teachers' reported use of various resources to plan mathematics instruction?

The two highest self-reported resources used for instruction were colleagues (mean = 3.41 [0.69], median = 4.00) and Teachers Pay Teachers (mean = 3.30 [0.775], median = 3.00). The three least frequently used practices were *Teaching Exceptional Children* (mean = 0.65 [0.96], median = 0.00), *Teaching Children Mathematics* (mean = 0.64 [1.02], median = 0.00), and the What Works Clearinghouse (mean = 0.23 [0.61], median = 0.00). A majority of educators reported they did not know about these resources: *Teaching Exceptional Children* (50%), *Teaching Children Mathematics* (55%), and What Works Clearinghouse (70%). A total of 110 teachers typed in a response when asked what other resources they use for mathematics instruction, the following five resources received the highest frequency (a) Khan Academy, (b) other curriculum resources [e.g., previous, freely available online], (c) previous materials from undergraduate, graduate, or professional development activities, (d) IXL, and (e) materials from the state department.

Do teachers differ in their reported use of resources based on the locale of their school?

Teachers differed on their self-reported use of 3 of 10 resources based on the geographical locale of their school (i.e., rural, suburban, urban). Rural educators (mean = 3.30 [0.75]) and urban educators (mean = 3.35 [0.71]) reported conversing which their colleagues less often than their suburban counterparts (mean = 3.59 [0.55]). Urban (mean = 3.00 [0.87]) and rural educators (mean = 2.98 [0.78])

Table 2. ***Descriptive Statistics for Teacher Self-Reported Use of Resources***

Resource	Mean (SD) Median	Do not know (0)	Never (1)	Rarely (2)	Occasionally (3)	Frequently (4)	Missing
Colleagues	3.41 (0.69) 4.00	4 (<1%)	5 (<1%)	60 (6.5%)	360 (39%)	436 (47%)	57 (6%)
TPT	3.30 (0.775) 3.00	1 (<1%)	26 (3%)	84 (9%)	353 (38%)	403 (44%)	55 (6%)
Google/Yahoo	2.92 (0.84) 3.00	6 (<1%)	41 (4%)	171 (18.5%)	412 (45%)	206 (22%)	86 (9%)
Pinterest	2.88 (0.87) 3.00	1 (<1%)	68 (7%)	164 (18%)	407 (44%)	205 (22%)	77 (8%)
Youtube	2.64 (0.94) 3.00	4 (<1%)	112 (12%)	212 (23%)	354 (38%)	148 (16%)	92 (10%)
Teaching Blogs	2.64 (0.95) 3.00	12 (1%)	97 (10.5%)	196 (21%)	358 (39%)	136 (15%)	83 (9%)
Specialists[a]	1.79 (1.06) 2.00	102 (11%)	191 (21%)	277 (30%)	173 (19%)	31 (3%)	148 (16%)
TEC	0.65 (0.96) 0.00	465 (50%)	158 (17%)	91 (10%)	39 (4%)	9 (1%)	160 (17%)
TCM	0.64 (1.02) 0.00	504 (55%)	112 (12%)	88 (9.5%)	56 (6%)	9 (1%)	153 (17%)
WWC	0.23 (0.61) 0.00	647 (70%)	77 (8%)	23 (2.5%)	15 (2%)	4 (<1%)	159 (17%)

Note. TCM = *Teaching Children Mathematics*; TEC = *Teaching Exceptional Children*; TPT = Teachers Pay Teachers; WWC = What Works Clearinghouse

[a]Specialists at the district office

Table 3. ***Correlations between Teacher Demographic Variables and Self-Reported Use of Resources***

Resource	Path to Certification	Role	Years of Experience	Geography
Colleagues	χ^2 (4, n = 865) = 4.93 $p = 0.29$	χ^2 (4, n = 865) = 8.56 $p = 0.04$ $\eta^2 = 0.005$	χ^2 (16, n = 865) = 18.32 $p = 0.30$	χ^2 (8, n = 865) = 33.07 $p < 0.01$ $\eta^2 = 0.032$*
TPT	χ^2 (4, n = 867) = 1.37 $p = 0.85$	χ^2 (4, n = 867) = 2.13 $p = 0.71$	χ^2 (16, n = 867) = 14.61 $p = 0.55$	χ^2 (8, n = 867) = 10.59 $p = 0.23$
Google/ Yahoo	χ^2 (4, n = 836) = 2.69 $p = 0.61$	χ^2 (4, n = 836) = 20.74 $p < 0.01$ $\eta^2 = 0.021$*	χ^2 (16, n = 836) = 37.99 $p < 0.01$ $r^2 = 0.017$*	χ^2 (8, n = 836) = 17.52 $p = 0.025$ $\eta^2 = 0.012$*
Pinterest	χ^2 (4, n = 845) = 11.22 $p = 0.02$ $\eta^2 = 0.012$	χ^2 (4, n = 845) = 5.22 $p = 0.27$	χ^2 (16, n = 845) = 23.45 $p = 0.10$	χ^2 (8, n = 845) = 12.85 $p = 0.12$
Youtube	χ^2 (4, n = 830) = 4.86 $p = 0.30$	χ^2 (4, n = 830) = 4.975 $p = 0.29$	χ^2 (16, n = 830) = 15.76 $p = 0.47$	χ^2 (8, n = 830) = 11.40 $p = 0.18$
Teaching Blogs	χ^2 (4, n = 799) = 14.02 $p < 0.01$ $\eta^2 = 0.012$	χ^2 (4, n = 799) = 11.465 $p = 0.02$ $\eta^2 = 0.004$	χ^2 (16, n = 799) = 18.64 $p = 0.29$	χ^2 (8, n = 799) = 9.38 $p = 0.31$
Specialists[a]	χ^2 (4, n = 774) = 2.47 $p = 0.69$	χ^2 (4, n = 774) = 5.29 $p = 0.26$	χ^2 (16, n = 774) = 14.87 $p = 0.53$	χ^2 (8, n = 774) = 84.53 $p < 0.01$ $\eta^2 = 0.096$*
TEC	χ^2 (4, n = 762) = 4.55 $p = 0.34$	χ^2 (4, n = 762) = 64.35 $p < 0.01$ $\eta^2 = 0.063$*	χ^2 (16, n = 762) = 26.72 $p = 0.04$ $r^2 = 0.009$	χ^2 (8, n = 762) = 8.44 $p = 0.39$

TCM	χ^2 (4, n = 769) = 4.47 *p* = 0.35	χ^2 (4, n = 769) = 6.11 *p* = 0.19	χ^2 (16, n = 769) = 36.20 *p* < 0.01 r^2 = 0.006	χ^2 (8, n = 769) = 8.07 *p* = 0.43
WWC	χ^2 (4, n = 763) = 3.62 *p* = 0.46	χ^2 (4, n = 763) = 15.64 *p* < 0.01 η^2 = 0.008	χ^2 (16, n = 763) = 15.09 *p* = 0.52	χ^2 (8, n = 763) = 4.10 *p* = 0.85

* = *small effect*

Note. TPT = Teachers Pay Teachers; TEC = *Teaching Exceptional Children*; TCM = *Teaching Children Mathematics*; WWC = What Works Clearinghouse; Path Cert is coded as 0 = Non-Traditional, 1 = Traditional; Role is coded as 0 = Gen Ed, 1 = SPED; Years of Experience is coded as 0 = 0–5 yrs, 1 = 6–10 yrs, 2 = 11–15 yrs, 3 = 16–20 yrs, 4 = 21–30 yrs; Geography is coded as 0 = Urban, 1 = Suburban, 3 = Rural.

[a]Specialists in District Office

were more likely to use Google or Yahoo to plan for mathematics instruction than suburban educators (mean = 2.78 [0.87]). Rural educators (mean = 1.40 [1.03]) were less likely to consult with specialists in their school district than urban educators (mean = 1.96 [0.99]) and suburban educators (mean = 2.14 [0.985]).

Do special education and general education teachers differ in their reported use of resources?

General education teachers (mean = 3.43 [0.69]) were more likely to ask colleagues for support than special education teachers (mean = 3.30 [0.68]). In addition, general education teachers (mean = 2.66 [0.92]) were more likely to use teacher blogs as a resource than special education teachers (mean = 2.51 [1.09]). Special education teachers (mean = 3.19 [0.78]) were more likely to use Google or Yahoo to plan instruction than general education teachers (mean = 2.87 [0.84]). Although this practice was used sparingly, special education teachers (mean = 1.18 [1.29]) were more likely to use *Teaching Exceptional Children* than general education teachers (mean = 0.54 [0.84]). Last, the What Works Clearinghouse was rarely used by educators, special education teachers (mean = 0.36 [0.815]) were more likely to use the resource than general education teachers (mean = 0.20 [0.56]).

Do teachers differ in their reported use of resources based on the path to certification they pursued?

Traditionally certified teachers (mean = 2.92 [0.86]) were more likely to use Pinterest to plan mathematics instruction than alternatively certified teachers (mean = 2.66 [0.915]). In addition, traditionally certified teachers (mean = 2.68 [0.93]) were more likely to use teacher blogs to plan mathematics instruction than alternatively certified teachers (mean = 2.37 [1.03]).

Do teachers differ in their reported use of resources based on their years of experience?

Teachers with 0–5 years of experience (mean = 2.77 [0.88]) were less likely to use Google or Yahoo to plan for mathematics instruction than all other teacher: 6–10 years (mean = 2.94 [0.81]), 11–15 years (mean = 2.96 [0.80]), 16–20 years (mean = 3.05 [0.85]), and 21–30 years (mean = 3.06 [0.79]). Although this was used rarely, teachers with 21-30 years of teaching experience (mean = 0.86 [1.15]) were more likely to use *Teaching Children Mathematics* to plan instruction than teachers with 11-15 years of experience (mean = 0.47 [0.82]). Although *Teaching Exceptional Children* was used rarely, differences were observed across years of experience.

Discussion

Identifying the resources educators use to plan for instruction is essential as the field engages in identification, dissemination, and implementation of EBPs. Knowing what resources educators' access to plan for mathematics instruction can inform dissemination efforts of evidence-based findings. Furthermore, identifying whether teachers differ in the types of resources they access based on demographic variables or school level variables can inform the differentiation of professional development opportunities and highlight where inequities may be occurring.

In regard to our first research question, the three least used resources were the two practitioner journals listed (i.e., *Teaching Exceptional Children*, *Teaching Children Mathematics*) and the What Works Clearinghouse. Roughly 50% of teachers stated they did not know about the two practitioner journals, with 70% stating they did not know about the What Works Clearinghouse. Roughly 5% of teachers stated they used either practitioner journal occasionally or frequently to plan for instruction. Only 2% of teachers reported using the What Works Clearinghouse frequently or occasionally to plan for mathematics instruction. This finding is concerning because these are the primary resources that are vetted through the research community and are one of the major avenues the research community uses to disseminate evidence-based findings to teachers.

The most frequently used resources were colleagues, Teachers Pay Teachers, search engines (i.e., Google, Yahoo), and Pinterest. Roughly 86% of teachers stated they used colleagues occasionally or frequently to plan for mathematics instruction. This is a critical finding to consider as stakeholders considering bolstering the EBP process in school settings. Hughes and Kritsonis (2007) found that strong professional learning communities focused on increasing content knowledge and research-based mathematics instruction lead to higher standardized mathematics achievement for students. However, colleagues can become a less informative resource if there is not a colleague with strong content knowledge and understanding of the research-based literature available. This can lead to the widespread adoption of pseudoscientific practices based on teacher testimonials, "It worked with huge success in my class!" rather than research-based findings.

Teachers stated they frequently or occasionally used Teachers Pay Teachers (82%), Pinterest (68%), and search engines (e.g., Google, Yahoo; 67%) to plan for mathematics instruction. This is not surprising because these resources are inexpensive or free and can be readily accessed. However, the concern is these resources are not vetted by researchers and may contain recommendations or materials that do not align with the research literature (Test et al., 2015). If educators lack the content knowledge and understanding of research-based literature they may inadvertently select resources and implement suggestions that are contradictory to research. With this knowledge educators however can be critical consumers of the available resources.

General and special education teachers reported using resources at different frequencies to plan for mathematics instruction. General education teachers reported seeking advice from colleagues more often than special education teachers. Although the mean differences were not socially significant (between *occasionally* and *frequently*), the frequency data suggest over half of general education teachers (52.5%) stated they *frequently* consulted with colleagues to plan mathematics instruction whereas roughly 40% of special education teachers rated *frequently* consulting with colleagues. This is not surprising considering most PreK through third-grade teachers are on grade level teams (i.e., multiple teachers providing instruction at that grade level), which makes querying colleagues more accessible. However, in regard to special education teachers, they may be the only special education teacher in their building providing mathematics instruction to students with disabilities at that grade level. We anticipated that perhaps special education teachers would seek advice from district level specialists who are tasked with providing technical support and training. However, neither general education nor special education teachers reported using this resource (mean usage fell between never and rarely). In looking at the frequency data closer roughly 4% of educators reported *frequently* consulting with district level specialists and 22% rated *occasionally*. District level specialists are tasked with building their expertise and may aid in the research-to-practice dissemination to teachers in their district; therefore, it is surprising so few teachers are using them for support and advice. An interesting finding was that special education teachers appear to be using search engines (e.g., Google, Yahoo) at higher frequencies to plan mathematics instruction than their general education counterparts (mean for special educators fell between *occasionally* and *frequently*, mean for general educations fell between *rarely* and *occasionally*).

Limitations

When interpreting findings several limitations should be considered. First, our goal was to identify the resources educators in a southwestern state use to plan for mathematics instruction. Thus, the generalizability of findings may be limited, particularly given some of the unique contextual factors in the state (e.g., high percentage of alternatively certified educators, high percentage of rural districts). Second, these data represent teacher self-report, which may vary from actual practice.

Implications for Practice and Future Research

Based on these findings, researchers may consider using social media to connect with teachers, including Teachers Pay Teachers and Pinterest, and writing blog posts to more widely disseminate evidence-based practices. We may also consider making membership in professional organizations (e.g., Council for Exceptional Children, National Council for Teacher of Mathematics) more affordable or free for teachers practicing in public schools. Furthermore, it would behoove researchers to think of developing meaningful partnerships with school districts to improve practice and provide knowledge to the field (e.g., Juniper Gardens Children's Project). This includes rural and remote districts, which may require technology to provide professional development and coaching.

We believe the current project highlights several critical avenues of future research. First, engaging in direct observation, and perhaps the collection of permanent products, to identify what types of resources or information teachers use from the internet to provide mathematics instruction would be useful. Interviews or open-ended responses may be helpful to determine why teachers spend time supplementing if a published curriculum is adopted school wide. As we highlighted above, not all internet sources are credible; thus, research identifying if educators are able to locate and use research-aligned information to plan for mathematics instruction would be informative. In addition, practitioner journals and the What Works Clearinghouse are not being used by many educators to plan for mathematics instruction. Understanding why these resources are not being used and identifying more impactful dissemination paths is critical for the field.

References

Albrecht, S. F., Johns, B. H., Mounsteven, J., & Olorunda, O. (2009). Working conditions as risk or resiliency factors for teachers of students with emotional and behavioral disabilities. *Psychology in the Schools*, *46*, 1006–1022. https://doi.org/10.1002/pits.20440

Ansari, D., & Lyons, I. M. (2016). Cognitive neuroscience and mathematics learning: how far have we come? Where do we need to go?. *ZDM*, *48*, 379–383. https://doi.org/10.1007/s11858-016-0782-z

Bettini, E., Gilmour, A. F., Williams, T. O., & Billingsley, B. (2020). Predicting special and general educators' intent to continue teaching using conservation of resources theory. *Exceptional Children*, *86*, 310–329. https://doi.org/10.1177/0014402919870464

Billingsley, B., & Bettini, E. (2019). Special education teacher attrition and retention: A review of the literature. *Review of Educational Research*, *89*, 697–744. https://doi.org/10.3102/0034654319862495

Bishop, A. G., Brownell, M. T., Klingner, J. K., Leko, M. M., & Galman, S. A. (2010). Differences in beginning special education teachers: The influence of personal attributes, preparation, and school environment on classroom reading practices. *Learning Disability Quarterly*, *33*, 75–92. https://doi.org/10.1177/073194871003300202

Burns, M. K., & Ysseldyke, J. E. (2009). Reported prevalence of evidence-based instructional practices in special education. *The Journal of Special Education*, *43*, 3–11. https://doi.org/10.1177/0022466908315563

Carnine, D. (1997). Bridging the research-to-practice gap. *Exceptional children*, *63*, 513–521. https://doi.org/10.1177/001440299706300406

Cook, B. G., & Cook, L. (2016). Leveraging evidence-based practice through partnerships based on practice-based evidence. *Learning Disabilities: A Contemporary Journal*, *14*, 143–157.

Cook, B. G., & Odom, S. L. (2013). Evidence-based practices and implementation science in special education. *Exceptional Children*, *79*, 135–144. https://doi.org/10.1177/001440291307900201

Every Student Succeeds Act of 2015, Pub. L. No. 114-95 § 114 Stat. 1177 (2015-2016).

Gable, R. A., Tonelson, S. W., Sheth, M., Wilson, C., & Park, K. L. (2012). Importance, usage, and preparedness to implement evidence-based practices for students with emotional disabilities: A comparison of knowledge and skills of special education and general education teachers. *Education and Treatment of Children*, *35*, 499–519. https://doi.org/10.1353/etc.2012.0030

Hammersley, M. (2007). *Educational research and evidence-based practice*. London, UK: Sage.

Harn, B., Parisi, D., & Stoolmiller, M. (2013). Balancing fidelity with flexibility and fit: What do we really know about fidelity of implementation in schools?. *Exceptional Children*, *79*, 181–193. https://doi.org/10.1177/001440291307900204

Hill, H. C., Blazar, D., & Lynch, K. (2015). Resources for teaching: Examining personal and institutional predictors of high-quality instruction. *Aera Open*, *1*, 1–23. https://doi.org/10.1177/2332858415617703l

Hott, B. L., Dibbs, R. A., Naizer, G., Raymond, L., Reid, C. C., & Martin, A. (2019). Practitioner perceptions of algebra strategy and intervention use to support students with mathematics difficulty or disability in rural Texas. *Rural Special Education Quarterly*, *38*, 3–14. https://doi.org/10.1177/8756870518795494

Hughes, T. A., & Kritsonis, W. A. (2007). Professional learning communities and the positive effects on student achievement: A national agenda for school improvement. *The Lamar University Electronic Journal of Student Research*, *4*, 1–5.

Individuals with Disabilities Education Act, 20 U.S.C. § 1400 (2004).

Maccini, P., & Gagnon, J. C. (2006). Mathematics instructional practices and assessment accommodations by secondary special and general educators. *Exceptional Children*, *72*, 217–234. https://doi.org/10.1177/001440290607200206

Maggin, D. M., Briesch, A. M., Chafouleas, S. M., Ferguson, T. D., & Clark, C. (2014). A comparison of rubrics for identifying empirically supported practices with single-case research. *Journal of Behavioral Education*, *23*, 287–311. https://doi.org/10.1007/s10864-013-9187-z

Marlow, D., & Cooper, M. (2008). The MetLife survey of the American teacher: Past, present and future. http://files.eric.ed.gov/fulltext/ED504457.pdf

Mason-Williams, L. (2015). Unequal opportunities: A profile of the distribution of special education teachers. *Exceptional Children*, *81*, 247–262. https://doi.org/10.1177/0014402914551737

National Center for Education Statistics. (2019). *The nation's report card 2019: Mathematics and reading assessments.* https://www.nationsreportcard.gov/

Opfer, V. D., Kaufman, J. H., & Thompson, L. E. (2016*). Implementation of K–12 state standards for mathematics and English language arts and literacy*. RAND. https://www.rand.org/content/dam/rand/pubs/research_reports/RR1500/RR1529-1/RAND_RR1529-1.pdf

Provasnik, S., Malley, L., Stephens, M., Landeros, K., Perkins, R., & Tang, J. H. (2016). *Highlights from TIMSS and TIMSS Advanced 2015: Mathematics and science achievement of U.S. students in grades 4 and 8 and in advanced courses at the end of high school in an international context* (NCES 2017-002). https://nces.ed.gov/pubs2017/2017002.pdf

Stormont, M., Reinke, W., & Herman, K. (2011). Teachers' knowledge of evidence-based interventions and available school resources for children with emotional and behavioral problems. *Journal of Behavioral Education*, *20*, 138–147. https://doi.org/10.1007/s10864-011-9122-0

Test, D. W., Kemp-Inman, A., Diegelmann, K., Hitt, S. B., & Bethune, L. (2015). Are online sources for identifying evidence-based practices trustworthy? An evaluation. *Exceptional Children*, *82*, 58–80. https://doi.org/10.1177/0014402915585477

U.S. Department of Education, Office of Special Education and Rehabilitative Services, Office of Special Education Programs, *41st Annual Report to Congress on the Implementation of the Individuals with Disabilities Education Act, 2019*, Washington, D.C. 2019.