



REPORT

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EVIDENCE BASED? A SYSTEMATIC LITERATURE REVIEW OF THE FOUR-DAY SCHOOL WEEK

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ADVANCING LIBERTY WITH RESPONSIBILITY
BY PROMOTING MARKET SOLUTIONS
FOR MISSOURI PUBLIC POLICY



KEY TAKEAWAYS

- There is little evidence to support adoption of the four-day school week.
- On average, the four-day school week appears to have small, negative effects on student achievement.
- The limited evidence that exists on the effect of the four-day school week on finances and teacher retention is mixed.

EXECUTIVE SUMMARY

When the Independence (MO) School District school board voted to move to a four-day school week (4dsw), it brought increased awareness to a growing trend in Missouri. As of fall 2023, roughly 28 percent of all Missouri school districts use a 4dsw. Traditionally, these school districts have been small, rural districts. The Independence School District was different. It was suburban, and by Missouri standards it was a relatively large school district, with more than 13,000 students. This move has led many to consider the relative advantages and disadvantages of the 4dsw. In this paper, we attempt to give policymakers, school officials, and parents important information about the effects of the 4dsw.

Research is essentially about answering questions. Researchers can approach questions from several directions. In conducting a survey, focus group, or other forms of qualitative research, the researcher is asking what people say about this issue. When conducting new empirical analyses, researchers are asking what the data say about this issue. In this paper, we use another common research method: the systematic literature review. Using this method, we ask what the literature says about this issue.

When conducting a systematic literature review, researchers first determine the precise questions they want to answer. They then determine their search terms and set the criteria for inclusion in the review. The end result is a systematic, unbiased process that can be replicated.

In this systematic literature review, we have attempted to find every research study, within our search and inclusion criteria, that has answered one of our four research questions:

1. What is the effect of moving to a 4dsw on student achievement?
2. What is the effect of moving to a 4dsw on school district finances?
3. What is the effect of moving to a 4dsw on teacher recruitment and retention?
4. What is the effect of moving to a 4dsw on parental satisfaction?

Our goal was to find the best methodologically sound papers that answered these questions. What we discovered was that not many of those studies exist. Rather, much of the research literature on the 4dsw focuses on qualitative or quantitative methods that do not employ sophisticated empirical methods. While teachers' perceptions about student achievement are important, we wanted to find whether the research data actually showed an impact on student achievement. While superintendent perceptions about finances are important, we looked for studies that actually assessed the impact on finances. Similarly, while focus groups can tell us about teachers' stated preferences regarding meeting patterns, we looked for studies that examined their revealed preferences in the form of retention data.

Our search of the literature resulted in just 12 studies that answered one of our research questions. Some of them answered more than one question, and in the end we had eight studies that addressed our question regarding student achievement, two studies on the question of finances, two answering the question on teacher retention, and two on parental satisfaction. Given the limited scope of the existing research, we cannot draw definitive conclusions. Nevertheless, we can see some patterns starting to emerge.

The 4dsw appears to have a small, negative impact on academic performance, on average. In both English/language arts (ELA) and mathematics, seven of eight studies included in this review reported a negative coefficient on the impact of the 4dsw on student achievement, though not all of these findings were statistically significant. In ELA, four of the eight studies yielded results that were statistically significant negative effects. Meanwhile in mathematics, six of the eight studies produced results that were statistically significant negative effects. The results were slightly less negative when the findings were restricted to rural students, with the sign

flipping from negative to positive on one study (which did not produce statistically significant results). These findings seem to indicate that moving to a 4dsw appears to have a small but negative impact, on average, on student achievement; however, the negative effects may be less pronounced on rural students.

Of course, when school officials decide to move to a 4dsw they do not typically make the case based on academics. Rather, they suggest the move will save the district money and improve teacher recruitment and retention. Here the evidence is even more sparse. On the finance question, we found just two studies that answered the question in a sufficiently rigorous manner. Both studies found that moving to a 4dsw may lead to a decrease in expenditures. However, these savings may be offset by a decrease in revenues. In other words, schools using the 4dsw may spend less, but they also receive less money. Though we can hardly draw definitive conclusions from two studies, the findings make intuitive sense.

Regarding teacher recruitment and retention, the results are also mixed. Much of the existing research literature is focused on teacher perceptions, which did not fall under the purview of our research question. We examined empirical studies that assessed retention and turnover data. We found no studies that assessed the impact on teacher recruitment and only three studies that focused on retention. One study found that the 4dsw reduced the likelihood that a teacher would leave, while one study found a significant negative effect on teacher retention rates. The third study did not produce a statistically significant finding.

Interestingly, parents in schools that move to 4dsw appear to like the reduced meeting pattern. In both surveys we found, more than 60 percent of responding parents seemed to prefer the 4dsw. In both studies, a portion of families appear to strongly dislike the approach. Though they are the minority, they should not be forgotten. One of the big challenges of a policy change like moving to a 4dsw is that it may have broad support from teachers, administrators, and even parents, but it may nevertheless create a significant burden on some families.

Conclusions and Key Policy Considerations

What can we make of all of this? For starters, there are relatively few rigorous studies that have assessed the

Summary of Study Results

Statistically Significant Effects Reported

	Total No. of Studies	Positive	None	Negative
Studies on Academics				
ELA test scores	8	0	4	4
Math test scores	8	0	2	6
Studies on Finances				
Total expenditures	2	0	1	1
Total revenues	2	0	1	1
Studies on Teacher Retention				
Teacher retention	3	1	1	1
Studies on Parent Satisfaction				
"If you were to have the choice between a four-day school week and a five-day school week, which would you choose?"		Definitely 4dsw: 69%		
"I would prefer that our school return to a five-day school week."		Disagree: 64%		

impact of the 4dsw. While many have studied the issue, they have not done so in a sufficiently rigorous, empirical manner. Thus, more research is needed. Nevertheless, we do see some threads emerging. The 4dsw is not likely to improve student achievement. If we are being charitable, we might say there was a negligible, not statistically significant, negative impact on student achievement. Being less generous, the data clearly suggest some students are harmed by the 4dsw. The conclusion is simple: the decision to move to a 4dsw cannot be sufficiently supported by the existing research evidence on the academic impacts. Rather, the evidence points in the opposite direction.

School officials tend to make the case for the 4dsw based on finances and teacher recruitment or retention. However, such claims are poorly grounded. The research literature is sparse, and what exists does not paint a clear,

positive picture. In short, when school districts choose to move to a 4dsw, they are doing so with very limited support from the academic literature.

When school districts move to a 4dsw, they may be pleasing a majority of parents. They may also be satisfying the desires of teachers or administrators, but they are also putting a portion of students at significant risk that may extend beyond the academic losses we have noted. For these reasons, it is important for school leaders to consider carefully whether this is the right move for their school district and how they might support high-need students.

For policymakers, the growth of the 4dsw in Missouri increases the need to expand educational options for Missouri students. Presently, most Missouri students, including those in 4dsw districts, do not have access to a variety of in-person educational options. To this end, state policymakers should consider expanding educational options for students, especially those in 4dsw districts. They can do this by advancing these three policy goals:

1. **Open enrollment:** Students in 4dsw districts should be allowed to transfer to a nearby public school district.
2. **Expand the MOScholars program:** Currently, the program is restricted so that it does not provide options to students in most school districts. All students in 4dsw districts should be eligible for this program.
3. **Expand charter school access:** Students are not allowed to attend charter schools across district boundaries, and there are restrictions on how charter schools may be opened. Students in 4dsw districts should be allowed to cross district boundaries to attend a charter school, and charters should be allowed to form within a 4dsw district without the school board's approval.

I. THE SYSTEMATIC LITERATURE REVIEW: A TECHNICAL REPORT

The 4dsw is a relatively new phenomenon that has been gaining traction in recent years, especially in rural Midwestern and Western states. From 1999 to 2019, the number of 4dsw schools rose from 257 to 1607

(Kilburn et al., 2021). Most of this growth has been west of Missouri. Interestingly, in the 2018–19 school year, every state west of Missouri had at least one 4dsw district (save Hawaii, which only has one school district), while only two states east of Missouri had districts that used a 4dsw (Thompson et al., 2022). Missouri itself has seen a significant increase in the number of schools using a 4dsw. During the 2022–23 school year, 146 Missouri districts (roughly 28 percent of all public school districts in the state) used a 4dsw, but that number continues to change with more districts adopting the model (Frank, 2023).

Given the significant number of school districts moving to or considering the 4dsw, it is important for policymakers, school officials, and concerned citizens to have accurate information regarding the effects of 4dsw. In this paper, we attempt to provide that information by answering four key questions:

1. What is the effect of moving to a 4dsw on student achievement?
2. What is the effect of moving to a 4dsw on school district finances?
3. What is the effect of moving to a 4dsw on teacher recruitment and retention?
4. What is the effect of moving to a 4dsw on parental satisfaction?

We answer these questions by conducting a systematic literature review. A systematic literature review is a way of answering research questions by examining all available studies that have addressed those questions. As the name suggests, it is a systematic process. This means others could replicate our search by following the methods we lay out in this paper. In our systematic search of the available research, we include only high-quality empirical studies—those that are quantitative, modern, and statistically rigorous.

A systematic literature review begins with an explicit statement of the research questions along with the search and review criteria. The researcher then begins searching using key search terms, systematically removing studies that do not meet the search criteria. This process helps avoid bias that can often enter into a traditional literature

review and allows researchers to capture every study that answers the research questions and fits within the inclusion criteria.

Most of the studies we found on the 4dsw did not meet our inclusion criteria because they did not answer the research questions empirically. Our difficulty in finding rigorous studies indicates a need for far more research on the 4dsw.

As is the case with other research studies, it is important to detail the methods used in conducting a systematic literature review. In the next section, we lay out our methodology. This includes a presentation of our search terms, as well as the criteria we applied to consider whether a study should be included in the analysis. These methods were determined prior to conducting our initial review of the literature.

Following the criteria section, we present a description of the studies included in our analysis. In this section, we attempt to give the reader a sense or general overview of the scope of each study included. Next, we present a review of the included studies. We used what is known as a “vote counting” approach. This means we do not use statistical methods to combine the effects. We conclude the paper with a summary and discussion of our findings.

II. LITERATURE SEARCH AND INCLUSION CRITERIA

To answer the four research questions, we systematically searched for all relevant studies. In the following paragraphs, we describe our systematic research process, including our search terms and inclusion criteria. By conducting this review in a systematic and transparent way, we hope to provide answers to the research questions based on the existing literature.

Criteria for Considering Studies for Review

Overarching Search Criteria for Considering Studies for Review

We set the following criteria for studies under consideration for inclusion in our review. We should note again that these criteria were set prior to conducting our search.

Geographical Location and Language: Only studies conducted on public school districts in the United States were accepted. Additionally, only articles written in English were accepted.

Time Frame: Only studies that examined data from after the 2008 recession were included in this study. The 2008 recession had noticeable effects on the teacher labor market, with many teachers being laid off during that period. Therefore, it would be best to evaluate the effect of four-day school weeks in the post-recession teacher labor market—especially for the research question concerning teacher recruitment and retention. Moreover, we wanted to limit our pool of studies to those conducted relatively recently. Therefore, we instituted a cut-off date of 2012.

Types of Studies: All relevant studies were included in this review; we did not restrict our analysis to studies published in peer-reviewed journals.

Type of Schools: This review is focused exclusively on public school districts that move from a standard five-day school week to a four-day school week, so it only included studies that examine this phenomenon. We did not include studies of charter or private schools that have a four-day meeting pattern.

Grade Level: We included studies that addressed our research questions at any K–12 grade level. We noted cases in which a study covered a district that does not serve all grades. We included studies that covered pre-K students only if we were able to net out the effects on non-pre-K students.

Cause for Transition to Four-Day School Week: We included all studies in which the decision to transition to a 4dsw was made at the district level. This included both board- and parent-driven initiatives that may have resulted in the change. We did not include any change that was forced from the state level or individual school level. These circumstances were different from the context in Missouri, where we are interested in the effects of districts moving to a 4dsw.

Specific Criteria for Considering Studies Relating to Research Question #1: What Is the Effect of Moving to a 4dsw on Educational Achievement?

Example of Excluded Study: Hedtke, Joel Timothy. "The Four-Day versus the Five-Day School Week: A Comparative Study of South Dakota Schools." North Dakota State University, 1 Jan. 2014, library.ndsu.edu/ir/handle/10365/23230.

Explanation: This study was excluded because it used student achievement data from 2006 to 2011.

Method of Measure for Educational Achievement: We included studies that measured academic outcomes in either math or English/language arts (ELA). Only studies that used standardized test outcomes were included. This may have included state tests or standardized tests from testing companies such as NWEA or ACT. To be included in our review, studies must have used appropriate methods to control for prior achievement and provided an appropriate counterfactual, such as difference-in-differences or value-added modeling.

Research Methods: Only studies that used a quasi-experimental approach, such as differences in differences, interrupted time series, or other rigorous approaches were included in this analysis. The study must have included a comparison group or some appropriately constructed counterfactual to test the statistical significance.

Specific Criteria for Research Question #2: What Is the Effect of Moving to a 4dsw on School District Finances?

Quantitative Data Analysis: To be included, the study had to be more than a simple pre-post. That is, it must do more than measure spending prior to and after implementation of a 4dsw. This methodology does not isolate the effect of the 4dsw. To be included, the study had to attempt to control for confounding variables that may impact a district fiscally. Moreover, the study had to test for statistical significance. To be included, a study had to perform a data analysis on any type of district spending (teacher salary, instructional costs, utilities) and isolate the effect of the independent variable (implementation of a 4dsw) on the type(s) of spending under examination. As with to Research Question #1, many studies were excluded due to their reliance on teacher and administrator perceptions of school finances.

Specific Criteria for Research Question #3: What Is the Effect of Moving to a 4dsw on Teacher Recruitment and Retention?

Quantitative Data, not Survey Results: To be included in this review, the study had to assess the impact on recruitment or retention quantitatively. These studies may measure turnover rates, retention rates, shortage measures, etc. We did not include qualitative surveys from teachers or administrators. Similar to Research Questions #1 and #2, a counterfactual comparison model is necessary in order to accurately measure the change in teacher recruitment or retention due to the implementation of a 4dsw. No studies using solely qualitative data were included.

Example of Excluded Study: Akins, Bryan D., "Four-Day Modified School Systems in Rural Oklahoma" (2022). Digital Commons @ ACU, Electronic Theses and Dissertations. Paper 435. <https://digitalcommons.acu.edu/etd/435>.

Explanation: While this study did use math and ELA scores as its measures of academic achievement, the research method used was an analysis of teacher perceptions of performance. Only quantitative achievement data using a quasi-experimental approach are included.

Specific Criteria for Research Question #4: What Is the Effect of Moving to a 4dsw on Parental Satisfaction?

No Convenience Samples: We accepted studies that assess parental satisfaction in a variety of ways. However, we did not accept studies that use limited convenience samples such as people in attendance at a PTO meeting. A survey must have been randomly given, given to the entire school community, or administered in other reputable ways. We were looking specifically at surveys of parents in school districts that used a 4dsw.

Search Strategy for Identifying Relevant Studies

We conducted our search for relevant research articles using Google Scholar. Below is the list of specific search terms used to locate studies addressing each of the four research questions.

1. “Four-day school week” “public schools” “academic”
2. “Four-day school week” “public schools” “spend”
3. “Four-day school week” “public schools” “teacher”
4. “Four-day school week” “public schools” “parent”

Once all the relevant articles containing the required search terms were compiled, we conducted a title review. A researcher read each relevant article’s title to evaluate whether the study could answer the relevant research question. Those that were duplicates or unrelated to the research question were eliminated. For example, “A Qualitative Study Examining the Perceptions of Special Education Team Members Regarding the Impact of the Four-Day School Week on Students Who Receive Special Education Services” was excluded. This study’s title indicates that the authors simply asked survey questions to workers in the field. Therefore, it did not have a place in the systematic literature review.

After the review of titles, we next reviewed the abstracts of all remaining articles. Papers that did not meet our inclusion criteria were again removed from the pool. Finally, the full texts of the remaining articles were examined to further determine whether the article fulfilled all previously mentioned criteria.

Though we used a clear, systematic process, it is always possible that a study may have escaped our notice or not appeared on Google Scholar. As one last check for relevant studies, we reviewed the citations in each paper to see if any studies were cited that we missed. In this case, our systematic search proved effective, as no additional studies were found in the reference search.

III. DESCRIPTION OF INCLUDED STUDIES

Our systematic process yielded 13 papers that met the research criteria of one of the four questions (Figure 1). Upon further review, we discovered that two of these papers were not unique. That is, the papers were essentially the same but had been published in different places.

After removing the duplicative paper, we were left with 12 unique research articles. Some of the papers answered multiple research questions. As a result, we had eight studies relating to student achievement, two relating to district finance, three relating to teacher recruitment or retention, and two relating to parental satisfaction. Table 1 displays the results of our search process at each step.

The search process for the effect of the 4dsw on academic achievement, district finance, teacher retention, and parental satisfaction produced only 12 unique studies that met all the inclusion criteria. Key summary statistics for all studies are displayed in Table 2. The secondary focus of selected studies appears in red. While there are many aspects and numerous states affected by the rise of the 4dsw, the literature that qualified for our review seems to focus primarily on academic achievement and the states of Oregon, Oklahoma, and Colorado.

Our search indicates there is a general shortage of publications studying the subject of the 4dsw. Even if we had removed the post-2012 stipulation from the publication requirements, the number of studies would not have greatly increased. As shown in Table 1, only 12 studies satisfied the required criteria. The number of authors on the subject is also relatively low. The lack of research on the 4dsw complicates the decision-making process for districts that are considering adopting a four-day schedule.

Figure 1

Breakdown of Included Studies

Three studies focused on two of our desired dependent variables.

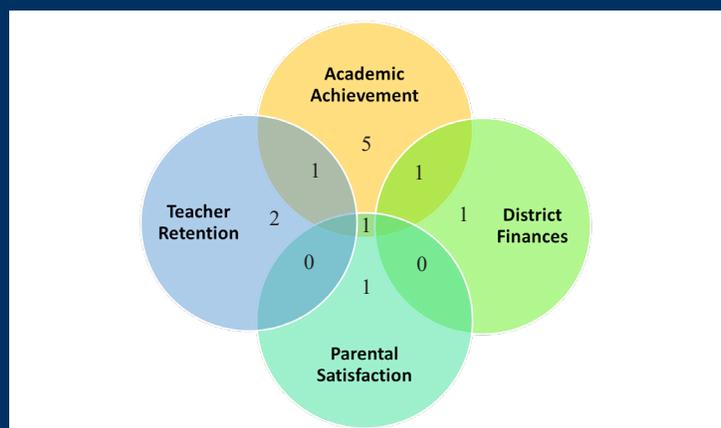


Table 1: Breakdown of Study Search Process

Google Scholar search for articles after 2012: "four-day school week", "public schools",	Initial Results	Title Search	Abstract Search	Article Search	Reference Search	Included Articles
"academic"	247	44	24	9	0	8
"spend"	165	19	6	2	0	2
"teacher"	248	18	11	3	0	3
"parent"	166	17	2	2	0	1

the literature. When the effects of an intervention are mixed, with some positive and some negative impacts, a meta-analysis can help assess the overall impact of the intervention. In this case, the results are not mixed between positive and negative. They are mixed between null and negative. With one exception, every paper reported a negative coefficient on the 4dsw. Not all of these findings were significant. Nevertheless, based on the best available research conducted since 2012, we can say with confidence that the 4dsw does not improve overall student achievement.

IV. RESULTS OF INCLUDED STUDIES

Four-day school weeks are a significant change to school districts and will affect students, teachers, and parents. The most important question, however, is how switching to a 4dsw will affect student performance. Unfortunately, relatively little rigorous research has been conducted on the subject. Since 2012, only eight studies were identified as meeting the minimum qualifications for rigor. It should also be noted that all academic achievement results from the studies included in our analysis evaluate test scores for students in third to eighth grades, except for Thompson et al. (2022) which analyzes 11th-grade scores and Morton (2023) which examines high school ACT scores. In the following sections, we present the literature's findings on (1) academic achievement, (2) district finances, (3) teacher retention and recruitment, and (4) parental perspectives.

Effects on Student Achievement

Table 3 displays a vote count of all studies that examined the 4dsw's effect on ELA achievement. The direction of the coefficient on the 4dsw is negative in every study save one, with four of the eight studies finding a significant negative relationship between the implementation of a 4dsw and ELA achievement.

Table 4 displays a vote count of all studies that examined the 4dsw's effect on mathematics achievement. As with ELA, the coefficients on the effect are all negative. Here, six of the eight studies found a significant negative relationship between 4dsw and mathematics achievement.

Vote counting of course is not a perfect measure, but it can paint a useful portrait of the overall findings from

Only two studies included Missouri in their data: Kilburn et al. (2021) and Thompson & Ward (2021). Both of these studies were at the district level. Only Kilburn et al. (2021) separated Missouri out individually, and they find the 4dsw had an effect of -0.019 standard deviation (SD) for ELA and -0.024 SD for math, neither of which were statistically significant. These analyses were conducted before the widespread proliferation of 4dsw in the state.

Academic Effects on Rural Students

Some of the studies attempted to isolate the impact of the 4dsw on rural students. Tables 5 and 6 show the results on ELA and mathematics achievement, respectively. Even looking only at rural districts, the 4dsw appears to have a negative effect on academic achievement in ELA. However, the effects are slightly smaller compared to the samples that include all 4dsw districts.

When examining the impact on rural students, the findings appear less negative with fewer studies finding statistically significant results. With the exception of Thompson et al. (2022), all of the coefficients remain negative. However, only three of the ELA analyses and one mathematics analysis found statistically significant results. These findings suggest rural students may be impacted by the 4dsw less than non-rural students.

Summary of Effects on Academic Achievement

In both ELA and math, the 4dsw appears to have a negative impact on student achievement. Of the eight studies included in this analysis, all but one had a negative coefficient on the overall relationship of the 4dsw and

achievement in ELA and math. Four of the eight studies found a statistically significant negative relationship between the 4dsw and ELA achievement, while six found a statistically significant negative relationship with mathematics achievement. The negative trend in the results is slightly lessened when the studies are restricted to rural students. Nevertheless, they remain, on balance, negative. The preponderance of the evidence suggests the 4dsw has a null to small negative impact, on average, on student achievement.

Effects on Finances

Generating reductions in expenditures is a key goal of the 4dsw. However, it is also possible that making systemic changes to school meeting patterns may also yield reduced revenue. These reductions may happen as schools receive less funding for services that are reimbursed. For example, a 4dsw district may offer fewer school lunches and receive less support from the federal government. Similarly, the district may reduce transportation miles and receive less funding from the state. Thus, decreases in revenues may offset cost savings.

Our search yielded only two studies that have examined the impact of the 4dsw on finances in a rigorous manner (that is, by actually analyzing finances and not relying on opinions of school personnel). These two studies analyzed finances in different ways, however, so it is harder to draw conclusions from the findings. In this section, we provide a detailed breakdown of the findings of these two papers. Table 7 displays the findings on expenditures, while Table 8 displays the findings on revenues. Keep in mind that from a district's perspective, decreasing expenditures by adopting a 4dsw would be a positive outcome, but decreasing revenues generally would not. Thompson (2021) used total expenditures and revenue, while Morton (2020) used per-pupil expenditures and revenue. As such, Morton's findings are displayed in dollar terms while Thompson's are displayed in standard deviations.

The findings on expenditures are a bit mixed between null and significant negative impacts. Here, a "negative" finding would be good. It would suggest moving to the 4dsw decreased expenditures. In some categories of spending, such as support services and transportation, we see both studies finding significant negative effects. Thus, there is limited evidence that the 4dsw may lead to small reductions in expenditure in some categories.

This evidence on expenditures should be considered in light of the research on revenues. When it comes to revenues, a negative effect would not be a good thing. It would imply the district is receiving less funding. As with revenues, the findings are mixed between null and significant negative impacts. When we consider the data in these two tables together, it suggests decreases in expenditures may be offset by decreases in revenues. Districts may spend less, but they also receive less money.

Effects on Teacher Retention

Increasingly, the move to a 4dsw has been prompted by the desire to improve teacher recruitment and retention. Using our selection criteria, we found three studies that analyze the impact of the 4dsw on retention. Other studies used surveys or qualitative methods to assess how much teachers liked the 4dsw. Those studies may be useful, but they do not tell us whether the changes led to changes in retention. That is what we attempt to assess here. Table 9 displays the results of the three studies.

Findings concerning teacher retention in the small set of available literature are mixed. Barber (2018) found a statistically significant positive impact on the probability to stay in a school, a 1.1 percent increase. Nowak, Perron, & Smith (2023) found a statistically significant, negative impact on teacher retention. Meanwhile, the findings from Maiden, Crowson, & Byerly (2020) were not statistically significant. With this, we cannot be confident that moving to a 4dsw will improve teacher retention in a school district.

We found no studies observing the effect of the 4dsw on teacher recruitment that met the criteria for our review.

In summary, the literature does not support the hypothesis that the 4dsw school week improves teacher retention.

Effects on Parental Satisfaction

Two surveys that attempted to quantify parental satisfaction with 4dsw met our search criteria (Figure 2). The surveys contained a total of 1,350 responses from parents in four states. Critics of 4dsw often worry that parents, especially in working-class families, may be imposed upon by the 4dsw. While this may be the case for a portion of families, it appears, overall, that a majority of parents prefer 4dsw. In Kilburn et al. (2021), 69 percent

Table 2: Summary of Accepted Studies

Author & Date	Category	State(s)	Grade & Data Year	Focus Level	Analytical Method
Morton, Thompson, & Kuhfeld (2022)	Academic achievement	CO, IA, KS, MT, ND, WY	3rd–8th 2009–2020	Student	Quasi-experimental two-way fixed effects difference-in-difference research design.
Thompson & Ward (2021)	Academic achievement	AZ, GA, ID, KS, MN, MO, MT, NM, NV, OK, OR, SD	3rd–8th 2008–2018	District	Two-way fixed effects difference-in-difference regression analysis.
Thompson et al. (2022)	Academic achievement	Oregon	11th grade 2005–2019	Student	Uses difference-in-difference model to analyze impact of moving from 5dsw K-8 school to 4dsw 9–12 school. Implements lagged controls on district characteristics and prior achievement variables.
Morton (2020)	Academic achievement <i>District Finance</i>	Oklahoma	3rd–8th 2009–2016 <i>K–12, 2004–2017</i>	District	Difference-in-difference model that attempts to match 4dsw with an equivalent 5dsw district.
Morton (2023)	Academic achievement	Oklahoma	9th–12th 2008–2019	District	Quasi-experimental DiD approach comparing the contemporaneous changes in ACT scores for 4dsw with those that have not yet adopted one.
Thompson (2021a)	Academic achievement	Oregon	3rd–8th 2006–2020	Student	Quasi-experimental fixed effect design using a lagged score model.
Kilburn et al. (2021)	Academic achievement <i>Parental perspective</i>	CO, ID, MO, NM, OK, SD	3rd–8th 2017–2020 <i>K–6 2019–2020</i>	District	Matched difference-in-difference design, which utilizes a time-series analysis. <i>All parents invited to participate in an online survey with cash reward.</i>
Nowak, Perrone, & Smith (2023)	Academic achievement <i>Teacher retention/ recruitment</i>	Colorado	3rd–8th 2017–2020 <i>K–12 2016–2021</i>	Student	Cohort-level analysis with multiple fixed effects included.

Secondary subjects for studies are in red type.

Author & Date	Category	State(s)	Grade & Data Year	Focus Level	Analytical Method
Thompson (2021b)	District finance	All 24 states that had a 4dsw in 2015	K–12 2000–2016	N/A	Difference-in-difference regression analysis that attempts to control for factors that naturally affect spending.
Turner et al. (2019)	Parental perspective	Missouri	2015–2016	N/A	All parents from three independent Missouri districts received a survey by mail.
Barber (2018)	Teacher retention/ recruitment	Oklahoma	2006–2018	Teacher	Difference-in-difference models that attempts to match a 4dsw with an equivalent 5dsw.
Maiden et al. (2020)	Teacher retention/ recruitment	Oklahoma	K–12 2014–2018	N/A	Used R statistical packages to run several multilevel regression models.

of respondents indicated they would definitely choose a 4dsw. Meanwhile, 64 percent of respondents in Turner et al. (2019) disagreed with the statement, “I would prefer that our school return to a five-day school week.”

As with most surveys, there may be a selection bias of participants. That is, the individuals who respond may not be representative of the larger targeted population.

Kilburn et al. (2021) attempted to understand the feelings behind many of the answers through the use of focus groups. In their focus groups, a few key positives were discussed. The first positive was simply that parents got to spend more time with their kids. While the five-day work week is the traditional and typical schedule, there are many occupations that do not operate in the traditional fashion. Parents with such jobs are able to take advantage of the extra day their children are at home. While Kilburn et al. (2021) did not find a change in the amount of sleep per week students who moved to a 4dsw get, focus groups reported that an extra day where students get to sleep in after a tough athletic event can be very beneficial.

The 4dsw is not entirely for rest and relaxation, however. Many parents use the additional day off to schedule dentist

appointments and other errands for their children—without having to come in late one day or miss a day of school entirely. Many rural families enjoy the 4dsw because it provides extra opportunity for students to work on the farm without wearing them out for the school week. Rural parents also enjoyed this aspect as it helps them teach their child about the family business and cultural values. One parent said, “Sometimes on Fridays those students need to be able to help their parents bale hay. There’s a lot of life skills that can be learned outside of the classroom setting.” Since a majority of 4dsw districts are rural, it makes sense that there would be positive feedback on the practice.

Even with all of these benefits, vital questions remain about how parents will provide childcare on the off day. If you have solely elementary school children, who is going to watch them on their day off? Who’s going to cook them a meal? Will high school children be up to no good? These are legitimate concerns. However, one needs to think about the demographics of a typical 4dsw district. Kilburn et al. (2021) and Turner et al. (2019) both provide detailed information on these issues. For K–6 students, Kilburn et al. find that 90.2 percent of students (in Idaho, New Mexico, and Oklahoma) spent all or part of their

Table 3: Effect of the Four-day School Week on ELA Achievement

Study	Standard Deviations (Standard Errors)	N	Unit of Analysis	Significant Positive Findings	Null Findings	Significant Negative Findings
Morton, Thompson, & Kuhfeld (2022)	-0.062*** (0.017)	2,454,045	Student Level: 3rd–8th			X
Kilburn et al. (2021)	-0.028 (0.018)	2,441	District Level: 3rd–8th		X	
Nowak, Perrone, & Smith (2023)	-0.247** (0.115)	1,223	Student Level: 3rd–8th			X
Thompson (2021)	-0.042** (0.017)	3,147,477	Student Level: 3rd–8th			X
Morton (2020)	-0.032 (0.041)	2,704	District Level: 3rd–8th		X	
Thompson & Ward (2021)	-0.029*** (0.013)	21,683	District Level: 3rd–8th			X
Thompson et al. (2022)	-0.034 (0.03)	341,390	Student Level: 11th		X	
Morton (2023) †	0.03 (0.18)	4,147	District Level: 9th–12th		X	
Votes on ELA Achievement				0	4	4

(*p-values*: * <0.1; ** <0.05; *** <0.01) (standard error in parentheses)

† Morton (2023) reports coefficients in terms of ACT scores, not in standard deviations.

off day supervised at home, 12.4 percent were supervised at someone else’s home, 2.9 percent were supervised at school, 2.3 percent were supervised at a government location, and 2.4 percent were supervised at daycare. These numbers indicate that many parents who reside in rural 4dsw districts are able to watch their children at their house. For 7th- to 12th-grade students, the results are similar: 72 percent were supervised at home, 9 percent were unsupervised at home, 24.9 percent were at another person’s home, 7.6 percent were at school, and 6.1 percent were at a government location (these data are from a self-reported youth survey).

Findings from Turner et al. (2019) align with those from Kilburn et al. (2021). Only 10 percent of all families were “concerned about the safety of my children [on the off day].” Concerns over food were not an issue either, as only 5.6 percent of all families agreed or somewhat agreed that

“the lack of the school lunch program [on the off day] has had a negative impact on our family.” Lastly, only 11.9 percent of all families agreed or somewhat agreed that “I have struggled to find childcare for my children on the off day.” The findings of Turner et al. (2019) tended to be consistent across demographic groups.

In summary, most parents in the studies reviewed here appear to appreciate the 4dsw, and common concerns about potential problems with the new schedule were not as pronounced as might have been expected.

V. CONCLUSION & POLICY CONSIDERATIONS

In this paper, we conducted a systematic literature review to answer four key questions about the 4dsw. The number one takeaway from this review is that there is not a strong

Table 4: Effect of the Four-day School Week on Mathematics Achievement

Study	Standard Deviations (Standard Errors)	N	Unit of Analysis	Significant Positive Findings	Null Findings	Significant Negative Findings
Morton, Thompson, & Kuhfeld (2022)	-0.051* (0.029)	2,498,362	Student Level: 3rd–8th			X
Kilburn et al. (2021)	-0.044* (0.023)	2,439	District Level: 3rd–8th			X
Nowak, Perrone, & Smith (2023)	-0.215* (0.121)	1,223	Student Level: 3rd–8th			X
Thompson (2021)	-0.059** (0.026)	3,151,173	Student Level: 3rd–8th			X
Morton (2020)	-0.052 (0.048)	2,704	District Level: 3rd–8th		X	
Thompson & Ward (2021)	-0.032** (0.013)	21,983	District Level: 3rd–8th			X
Thompson et al. (2022)	-0.09*** (0.027)	341,390	Student Level: 11th			X
Morton (2023)	0.18 (0.17) ^t	4,147	District Level: 9th–12th		X	
Votes on ELA Achievement				0	2	6

(*p*-values: * <0.1; ** <0.05; *** <0.01) (standard error in parentheses)

^t Morton (2023) reports coefficients in terms of ACT scores, not in standard deviations.

research base to support decisions to move to a 4dsw. Typically, school board members and policymakers want to make evidence-based decisions. Here, the evidence is extremely weak.

In terms of academics, the best available evidence suggests the 4dsw will have null to small negative impacts on student achievement. These effects may be less pronounced in rural districts. Nevertheless, there is almost no evidence that the 4dsw will lead to academic gains.

To our knowledge, academics is not typically the reason school officials cite for moving to a 4dsw. Rather, they tend to cite finances and teacher retention as the primary motivating factors. As such, a small impact on academics might be acceptable if it led to improved finances and ultimately led to an improved teacher workforce. Unfortunately, the results in these areas are

simply not cut and dried. We found only two studies that rigorously assessed the impact on finances. While they both found savings on expenditures, they also found offsetting reductions on revenues. Likewise for teachers, the literature reports no clear evidence of a positive effect on teacher retention. In fact, one study found a significant negative effect on teacher retention.

Despite the possibility that the 4dsw may decrease academic achievement while not having any significant impacts on finances or the teacher workforce, parents seem to like it. In the two surveys we found, a majority of parents in school districts that made the switch to a 4dsw preferred the four-day meeting pattern. These findings fit with broader survey results indicating many parents prefer to have their kids go to school less often. A 2023 EdChoice poll of 1,271 parents found strong support for

Table 5: Effect of Four-day School Week on ELA Achievement (Rural Students)

Study	Standard Deviations (Standard Errors)	N	Level	Significant Positive Findings	Null Findings	Significant Negative Findings
Morton, Thompson, & Kuhfeld (2022)	-0.038* (0.019)	2,443,714	Student Level: 3rd–8th			X
Thompson (2021)	-0.048** (0.024)	311,863	Student Level: 3rd–8th			X
Morton (2020)	-0.032 (0.041)	2,704	Student Level: 3rd–8th		X	
Thompson & Ward (2021)	-0.031** (0.013)	13,963	District Level: 3rd–8th			X
Thompson et al. (2022)	0.011 (0.096)	N/A†	Student Level: 11th		X	
Votes on ELA Achievement				0	2	3

(*p-values*: * <0.1; ** <0.05; *** <0.01) (standard error in parentheses)

†Thompson et al. (2022) did not separately report the sample size of rural observations.

Table 6: Effect of Four-day School Week on Mathematics Achievement (Rural Students)

Study	Standard Deviations (Standard Errors)	N	Level	Significant Positive Findings	Null Findings	Significant Negative Findings
Morton, Thompson, & Kuhfeld (2022)	-0.012 (0.026)	2,486,107	Student Level: 3rd–8th		X	
Thompson (2021)	-0.031 (0.037)	312,142	Student Level: 3rd–8th		X	
Morton (2020)	-0.052 (0.048)	2,704	District Level: 3rd–8th		X	
Thompson & Ward (2021)	-0.044*** (0.014)	14,119	District Level: 3rd–8th			X
Thompson et al. (2022)	0.084 (0.094)	†	Student Level: 11th		X	
Votes on ELA Achievement				0	4	1

(*p-values*: * <0.1; ** <0.05; *** <0.01) (standard error in parentheses)

†Thompson et al. (2022) did not separately report rural observations.

Table 7: Effect of 4dsw on Different District Expenditures

Study	Change (Standard Errors)	N	Level of Observation	Significant Positive Findings	Null Findings	Significant Negative Findings
Morton (2020)	-\$273.59 (\$241.39)	4,576	Per pupil		X	
Thompson (2021)	-0.029*** (0.009)	143,429	Total			X
Votes for Total Expenditures				0	1	1
Morton (2020)	-170.15* (\$89.52)	4,576	Per pupil			X
Thompson (2021)	-0.036*** (0.009)	143,428	Total			X
Votes for Support Services Expenditures				0	0	2
Morton (2020)	-\$40.10*** (\$15.23)	4,576	Per pupil			X
Thompson (2021)	-0.107*** (0.014)	139,001	Total			X
Votes for Transportation Expenditures				0	0	2
Morton (2020)	-\$86.70*** (\$31.57)	4,576	Per pupil			X
Thompson (2021)	-0.009 (0.011)	141,863	Total		X	
Votes for Operational Expenditures				0	1	1
Morton (2020)	-\$94.79 (\$91.94)	4,576	Per pupil		X	
Thompson (2021)	-0.032*** (0.008)	143,428	Total			X
Votes for Instructional Expenditures				0	1	1

(p-values: * <0.1; ** <0.05; *** <0.01)

the 4dsw.¹ Sixty-one percent either strongly supported or somewhat supported their children's school moving to a 4dsw. These numbers are similar to the results of the two studies included in this review.

While our results do not provide strong justification for the 4dsw, they also do not suggest the new schooling

¹ EdChoice (2023). Survey finds parents supportive of a four-day school week. <https://www.edchoice.org/engage/survey-finds-parents-supportive-of-a-four-day-school-week/>

arrangement is altogether a bad idea. It is an educational policy that needs more study. It is also a policy that should be given significant consideration by local school boards and state policymakers. The bottom line is that some students are worse off in this arrangement. It is these students whom policymakers must take most into consideration.

The types of students who would be most negatively impacted by the 4dsw are likely to be students who need

Table 8: Effect of Four-Day School Week on District Revenue

Study	Change (Standard Errors)	N	Level of Observation	Significant Positive Findings	Null Findings	Significant Negative Findings
Morton (2020)	-\$270.74 (\$276.23)	4,576	Per pupil		X	
Thompson (2021)	-0.026*** (0.008)	143,428	Total			X
Votes for Total Revenue				0	1	1
Morton (2020)	\$6.08 (\$265.09)	4,576	Per pupil		X	
Thompson (2021)	-0.023 (0.016)	139,001	Total		X	
Votes for Local Revenue				0	2	0
Morton (2020)	-\$177.34 (\$140.13)	4,576	Per pupil		X	
Thompson (2021)	-0.068*** (0.016)	143,351	Total			X
Votes for State Revenue				0	1	1
Morton (2020)	-\$99.48** (\$46.12)	4,576	Per pupil			X
Thompson (2021)	-0.043** (0.019)	142,717	Total			X
Votes for Federal Revenue				0	0	2

(*p-values*: * <0.1; ** <0.05; *** <0.01)

quality in-person instruction. Currently, most Missourians have no in-person options outside of their local public school. This is why it is important for policymakers to expand educational options, especially for students in 4dsw districts.

When a district moves to a 4dsw model, it should automatically trigger an open enrollment process. Any student in a 4dsw district should be given the opportunity to transfer to a nearby public school in a neighboring school district. This would allow students the opportunity to remain in a school that meets five days a week.

Additionally, the state should expand eligibility for the MOScholars Program to include any student in a 4dsw district. The MOScholars Program is a tax credit–

supported private school scholarship program. Eligibility is currently restricted on several lines, including by geography. For this reason, most students in 4dsw districts are not eligible for the program. The state could ensure students in a 4dsw district have additional educational options by expanding the eligibility.

Finally, the state should expand access to charter schools. Currently, students are not allowed to enroll in a charter school across district boundaries. The state should remove this limitation. At present, this would not provide many students with access to additional schools as all charter schools are in the Kansas City and St. Louis areas. This is why policymakers should also revise how charter schools are allowed to open. Presently, charters cannot open in most school districts without the district's approval. This

Table 9: The Effect of the Four-Day School Week on Teacher Retention

Study	Standard Deviation (Standard Errors)	N	Significant Positive Findings	Null Findings	Significant Negative Findings
Nowak, Perrone, & Smith (2023)	-0.047** (0.019)	12,181			X
Maiden et al. (2020)	-0.019 (0.012)	N/A		X	
Barber (2018) ⁺	0.011** (0.0045)	494,694	X		
Votes on Teacher Retention			1	1	1

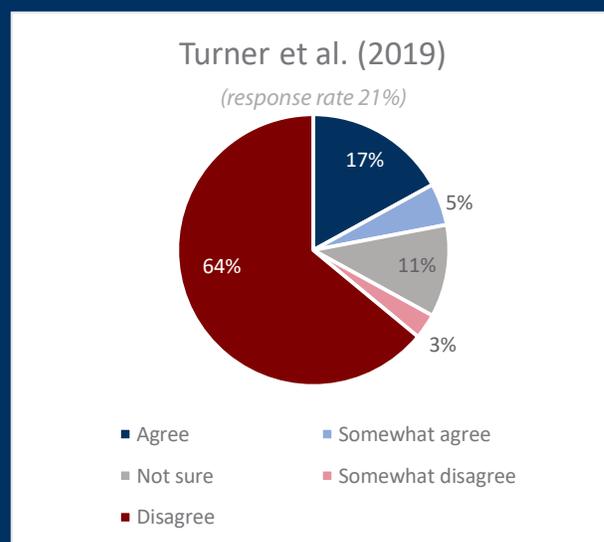
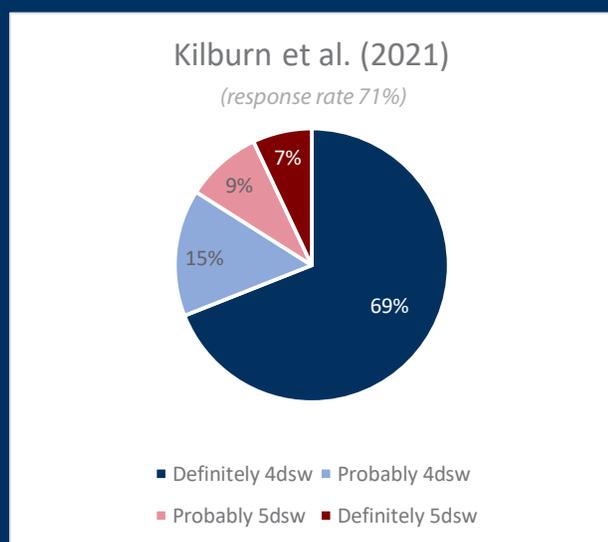
(*p-values: * <0.1; ** <0.05; *** <0.01*)

+ Barber (2018) measures his dependent variable as “probability of teacher leaving Oklahoma public schooling,” while the other two studies measure their dependent variable as “teacher retention rate.” The sign of Barber’s (2018) results was flipped in order to match dependent variables.

Figure 2

Four-Day School Week Versus Five-Day School Week Preference

Substantial support for the 4dsw is suggested by the two studies included in our survey. Note that both these studies were surveys of parents with children in four-day schools, not parents overall.



severely limits charter expansion. The state should allow a charter to be sponsored without district approval in any 4dsw district. This would allow for the creation of more educational options for students.

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