SECTION II
RESEARCH INTO VIRTUAL AND BLENDED SCHOOLS:
A LASTING LEGACY OF LITTLE IMPACT

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Executive Summary

Thirty years have passed since the first U.S. K-12 online learning program was established; 25 since the first supplemental virtual school appeared; 20 since the for-profit education management organizations K12 Inc. and Connections Academy were founded; and, 10 years since the NEPC's first report on virtual education was published. In light of these decades of experience and reports, this section briefly surveys recent related research and findings consistent over time, including those from this series of NEPC reports. It further explores issues related to the impact of findings on policy and practice.

Consistent with broader research in the field, reports in this series have repeatedly found that students in both virtual and blended schools generally underperform their brick-and-mortar counterparts. As those sectors continue to grow, legislators and other policymakers have nevertheless largely failed to impose additional oversight and accountability—a failure that may be attributed largely to the fact that corporate providers have large coffers and influence, as do supportive ideologically driven individuals and organizations. A contributing factor, some argue, is that researchers have not yet established a credible base of useful strategies for practitioners and policymakers, a gap that became starkly apparent in March 2020 when education leaders working to immediately implement virtual instruction found both schools and practitioners unprepared for an online environment.

Providing a counterexample to the general failure of most researchers and research to affect policy and practice, the state-funded Michigan Virtual Learning Research Institute (MLVRI) has had significant positive effects. Its designated mission is to analyze the effectiveness of online models by tracking enrollments, completion rates, and overall student impact as well as to study and strengthen 19 discrete areas of teaching and learning. While its existence hardly guarantees that state policy will align with its findings, the institute has certainly benefited Michigan's virtual and blended education programs and their stakeholders. Since the pandemic forced schools to close and implement online learning, MVLRI has provided: research-based guidance for students, parents, school-based mentor teachers, online teachers, school board officials, and administrators; a tool for school leaders to review online curriculum; orientation modules for students new to online learning; access to webinars and courses for teachers; and, a series of resources and learning opportunities specific to remote teaching.

Notwithstanding this positive example, the broad field of research on K-12 virtual and blended schools has been appropriately criticized for: confusing terminology; a lack of historical perspective; the absence of construct validity; a fragmented rather than systemic approach; and, American-centrism.

Given these factors, it is recommended that:

- State and federal legislators create goals for a comprehensive research program designed to inform policy for, and improve practice in, virtual and blended schools.

- State and federal legislators either create new independent entities, or support existing ones, charged with undertaking long-term research programs to evaluate virtual and blended schools.

- Researchers in the field design future efforts with a focused effort to avoid known limitations in existing literature.
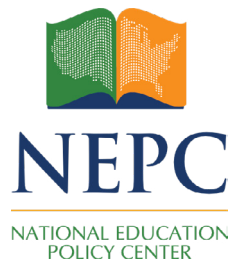
Section II
Research into Virtual and Blended Schools: A Lasting Legacy of Little Impact

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Introduction

The field of K-12 online and blended learning has marked several milestones: 30 years since the first K-12 online learning program was launched[1]; 25 years since the first supplemental virtual schools were established[2]; 20 years since the dominant, for-profit education management organizations K12 Inc. and Connections Academy[3] were founded; and, over 25 years since the first journal article on K-12 online learning was published.[4] In addition, this report marks the tenth year of NEPC reports on virtual and blended education. Among designated purposes for the series is to "assess the research evidence that bears on K-12 virtual teaching and learning . . . [and to] provide research-based recommendations to help guide policymaking."[5] This section addresses that goal by asking: After decades of experience, what is known from and about research in the field? What is the relationship of those findings to policy? And, what recommendations do answers to those questions imply?

Recent research indicates both a continuing trend to characterize what is known and an emerging trend to examine the nature of existing research. Typically, this section of this annual report would further detail research specifically related to the findings in its first and third sections. However, those findings have remained unchanged over the years, consistent with findings in the broader field: Both virtual schools and blended schools generally have poor outcomes, and policymakers pay little or no attention to research findings—although the Michigan Virtual Learning Research Institute (MVLRI) demonstrates the potential of state research centers to have positive effects. Rather than repeat what has already been said in these reports multiple times with only minor annual updates, the following discussion moves instead to demonstrate contributions of this series to the literature base over time. Final segments then explore the persistent lack of alignment among research, policy, and practice. To explain the misalignment, the report moves on to detail first the influence

of well-funded corporate and ideologically motivated promoters, and then weaknesses in existing research. The conclusion includes recommendations stemming from the discussion.

Recent Research Trends

Recently, while researchers have continued asking what is known from existing research about K-12 virtual and blended schooling, they have also begun asking more and more questions about characteristics of the existing literature base. More specifically, questions have probed such topics as who has been doing the research, where it has been published, and what can be learned from emerging patterns.

The second edition of the *Handbook of Research on K-12 Online and Blended Learning* constitutes one notable effort to summarize credible findings.[6] It is organized around nine guiding questions, asking what existing research had to say about each of several important topics: background and historical markers contextualizing the field; learning in K-12 online and blended environments; preparing and mentoring current and future teachers; similarities and differences among content areas; preparing and mentoring support personnel; effective design for online and blended learning; new insights; global implementation; and emerging issues in research, policy, and practice. In addition to those broad topics, introductory chapters include examination of the field's history and current practice both in the U.S and internationally, as well as a historical analysis of policy.[7] Also included are chapters on the theory, methodologies, measurement instruments, and role of evaluation in driving the research.[8]

Consistent with the theme of those introductory chapters, recent work has begun probing characteristics of the research itself. For example, the journal *Distance Education* published an analysis of 356 journal articles by 384 distinct authors from 1994 to 2016.[9] The authors found that almost 60% of the articles were authored or co-authored by the 20 most prolific scholars; however, over 70% of the authors had published only a single article. Additionally, although the *Journal of Online Learning Research* initiated publication only in 2015, it published the largest percentage of articles analyzed (i.e., 7% of all articles reviewed and 41% of those published 2015-2017). Of the 155 journals publishing articles, 102 published only a single article on the topic of K-12 online learning. Taken together, these findings indicate that research in the field of K-12 online learning has been largely characterized by authors and journals with little to no experience with the field prior to or following the publication of a single article.

Because that article's authors made their data set publicly available, others have mined it and made additional contributions to this line of inquiry. For example, a 2019 article presented an analysis of the first four years of the *Journal of Online Learning Research*.[10] They found that it published a much higher proportion of articles focused on K-12 blended learning, in both special topic and regular issues. The authors also found the topics of teacher preparation and professional development appeared overrepresented in the scholarship. Finally, the authors confirmed an overwhelming U.S. focus in both authorship and the studies' geographic location.

Another example of work growing out of the *Distance Education* article was published in *Online Education*.[11] Authors noted that while citation information was included for the inventoried articles, several received little attention—52 received five or fewer citations, while 10 received none. The authors speculated that even though the sample included well-known researchers and one-time authors, the articles may have attracted less scholarly attention because of a relatively narrow focus, often on programs or published in outlets outside the U.S.. Interestingly, the authors noted:

> What we did not find were articles that were uninteresting, poorly researched, or irrelevant. Many of the articles described and discussed programs that grappled with and overcame some of the same challenges online learning still faces today: issues of interaction, community, technology, management, etc.[12]

This work suggests that whatever weaknesses there may be among authors and publications, some relevant and credible research is escaping notice.

This brief summary of recent trends provides context for readers interested in how research in the field has been evolving. In earlier NEPC series editions, this second section has also typically included a review of research specific to topics in the first section (i.e., growth, demographics, and performance of schools) and third section (i.e., key policy issues). However, findings in those areas have been consistent over time: Both full-time virtual and blended schools typically perform poorly in relation to brick-and-mortar schools; and, year after year, state legislatures have been largely unwilling to pass bills strengthening oversight and accountability.[13] This year those findings appear yet again. Given this unchanging picture, rather than yet again reviewing much of the same literature on those topics with some minor annual updates, an exploration of how these reports have contributed to the existing research base over time seems a more productive overview.

A Decade of NEPC Research into Virtual and Blended Schooling

The following segments survey the areas that have become the topics for Section I of this annual report—growth, characteristics, and performance of full-time virtual education and blended schools—and for Section III, policy governing those schools.

Research on Student Performance and Demographics

The first NEPC report on virtual schooling, titled *Online K-12 Schooling in the U.S.: Uncertain Private Ventures in Need of Public Regulation*, was designed to examine the state of K-12 online learning, broadly speaking. It included the topics of supporting research, influential forces, and regulatory issues. In the executive summary, the authors reported:

> Over just the past decade, online learning at the K-12 level has grown from a novelty to a movement . . . Little or no research is yet available on the outcomes of such full-time virtual schooling. Partial or blended approaches to virtual edu-

cation, however, have existed for some time and have been studied fairly extensively . . . and research has shown the virtual courses to produce test scores comparable to those from conventional, face-to-face courses. While such research is useful, it tells us little about scaling up from isolated courses to full-time virtual schooling . . . Moreover, the rapid growth of virtual schooling raises several immediate, critical questions for legislators regarding matters such as cost, funding, and quality. [14]

These issues, of course, continue to be concerns.

The following year, reports began focusing on full-time K-12 virtual schools, closely examining the education management organization (EMO) K12 Inc. (now Stride, Inc.).[15] Still the dominant for-profit provider today, even then K12 Inc. offered full-time online learning opportunities to more students than any other provider. In the report, the authors found that: Students attending K12-operated schools were less likely to be a minority, receive free or reduced lunch, be an English language learner, have a disability, or be characterized as at-risk; while K12 Inc. schools received less funding than traditional public schools, they also experienced many cost advantages; and K12 Inc. produced weaker student outcomes across a range of performance measures.

In 2013, this series began consistently tracking the existence and the performance of full-time, publicly funded K-12 virtual schools, describing policy issues and assessing supporting research. From 2013-19, the authors consistently reported that students attending full-time K-12 virtual schools were performing poorly relative to their brick-and-mortar counterparts (see Table 2.1).

Table 2.1. Summary of NEPC Research Related to the Effectiveness of Virtual Schools

NEPC Report	Finding
2013	While 52% of brick-and-mortar district and charter schools met AYP, only 23.6% of virtual schools did the same. [16]
2014	"Virtual schools' Adequate Yearly Progress results were 22 percentage points lower than those of brick-and-mortar schools . . . The on-time graduation rate for full-time virtual schools was close to half the national average: 43.8% and 78.6%, respectively."[17]
2015	"Full-time virtual schools continued to lag significantly behind traditional brick-and-mortar schools . . . The on-time graduation rate (or four-year graduation rate) for full-time virtual schools was nearly half the national average: 43.0% and 78.6%, respectively."[18]
2016	"Of the 121 virtual schools for which data were available, 22 (18.2%) had proficiency rates above the state average; 82% had proficiency rates below state averages . . . The on-time graduation rate (or four-year graduation rate) for full-time virtual schools was half the national average: 40.6% for virtual schools and 81.0% for the nation as a whole."[19]

2017	"[Only] 37.4 percent of full-time virtual schools received acceptable performance ratings . . . The graduation rate of 43.4% in virtual schools [compared very poorly to a national average of 82.3%]." [20]
2018	"Virtual schools continued to underperform academically, . . . 36.4% of full-time virtual schools received acceptable performance ratings. The graduation rate of 50.7% in virtual schools . . . fell far short of the national average of 83%." [21]
2019	"Overall, 48.5% of full-time virtual schools were rated acceptable . . . the on-time graduation rates for full-time virtual schools (50.1%) . . .fell far short of the national average of 84%." [22]

Echoing the past, Section I of this year's report finds that for the 2019-20 school year, only the percentage of acceptable ratings for virtual schools dropped from 48.5% to 42.8%.[23] These findings of poor performance were consistent with the larger body of research into student performance in full-time K-12 virtual schools (see Appendix II-A). In fact, some scholars have even suggested that the reality for many students, particularly those in rural areas, is that for families interested in school choice options, the only alternative to a failing brick-and-mortar neighborhood school is a failing virtual charter school.[24]

The results of the research on performance is even more troubling when the demographics of students enrolled in full-time K-12 virtual schools is considered (see Table 2.2).

Table 2.2. Summary of NEPC Research Related to the Proportion of Students by Demography Enrolled in Virtual Schools Compared to the National Average

NEPC Report	Demographic Characteristics									
	White	Black	Hispanic	Asian	Native Am	Pacific Islander	Mixed/2 or More	FRL	SpEd	ELL
2013[25]	⇑	⇓	⇓	⇓	=			⇓	⇓	⇓
2014[26]	⇑	⇓	⇓	⇓	=			⇓	⇓	⇓
2015[27]	⇑	⇓	⇓	⇓	=			⇓	⇓	⇓
2016[28]	⇑	⇓	⇓	⇓	=	=	⇑	⇓		⇓
2017[29]	⇑	⇓	⇓	⇓	=	=	⇑	⇓	=	⇓
2018[30]	⇑	⇓	⇓	⇓	=	=	⇑	⇓	=	⇓
2019[31]	⇑	⇓	⇓	⇓	=	=	⇑	⇓	⇑	⇓

⇑ higher proportion of students compared to national average
⇓ lower proportion of students compared to national average
= approximate the same proportion of students compared to national average

Essentially, full-time K-12 virtual schools have historically served a higher proportion of White students and a lower proportion of minority students, significantly fewer students receiving free and reduced lunch, fewer English language learners, and fewer students with disabilities (although the disabilities trend has shifted recently).

In 2016, blended schools were added to the project. Patterns for student performance have been similar for full-time K-12 blended schools (see Table 2.3).

Table 2.3. Summary of NEPC Research Related to the Effectiveness of Full-Time K-12 Blended Schools

NEPC Report	Finding
2016	"Blended schools tended to score even lower on performance measures than virtual schools . . . [Only] five out of 22 independent blended schools (22.7%) had a higher percentage of students rated proficient than the state percentage. The on-time graduation rate (or four-year graduation rate) for full-time blended schools was half the national average: 37.4% for blended schools and 81.0% for the nation as a whole."[32]
2017	" . . . 72.7% acceptable ratings for blended schools . . . The graduation rate of 43.1% in blended schools fell far short of the national average of 82.3%."[33]
2018	" . . . 43.1% of blended schools received acceptable performance ratings . . . The graduation rate of 49.5% in blended schools fell far short of the national average of 83%."[34]
2019	"A total of 44.6% blended schools were rated acceptable. This is the first time in the last two years that blended schools perform less than virtual schools . . . "[35]

Similarly, this report's first section finds that only 44.1% of blended schools were rated acceptable in 2019-2020.[36] Unfortunately, there is not yet a larger body of research on blended schools for comparison of these findings. One positive finding to emerge, however, is that blended schools appear to be serving a more diverse range of students, especially Hispanic students (see Table 2.4).

Table 2.4. Summary of NEPC Research Related to the Proportion of Students by Demography Enrolled in Blended Schools Compared to the National Average

NEPC Report	Demographic Characteristics									
	White	Black	Hispanic	Asian	Native Am	Pacific Islander	Mixed/2 or More	FRL	SpEd	ELL
2016[37]	⇓	⇓	⇑	=	=	=	⇑	=		
2017[38]	⇓	⇓	⇑	=	=	=	⇑	⇓	=	⇑
2018[39]	⇓	=	⇑	=	=	=	⇑	⇑	⇓	⇓
2019[40]	⇓	⇓	⇑	=	=	=	⇑	=	=	⇓

⇑ higher proportion of students compared to national average
⇓ lower proportion of students compared to national average
= approximate the same proportion of students compared to national average

The fact that students in both full-time virtual and blended schools continue to perform poorly is particularly disappointing in light of the fact that overall, those schools serve fewer students typically classified as "at risk."[41]

Research on Policy

Findings related to policy, the topic of the following section, are also dismally consistent: Little or no meaningful regulation has been enacted over the last several years (see Table 2.5).

Table 2.5. Summary of NEPC Research Related to the Legislative Changes

NEPC Report	Finding
2013	"Although there have been some recent legislative efforts to clarify expectations in such areas as accountability and standards, states are struggling to establish accountability mechanisms appropriate for both guiding and auditing virtual schools—even as they allow them to expand . . . A continuing challenge for states will be to reconcile traditional funding mechanisms, governance structures, and accountability demands with the unique organizational models and instructional methods found in virtual schools." [42]
2014	" . . . policymakers have been struggling to reconcile traditional funding structures, governance and accountab ility systems, instructional quality, and staffing demands with the unique organizational models and instructional methods of virtual schooling."[43]
2015	"Our analysis revealed that state legislatures have proposed bills that attempt to increase oversight of virtual schools; however, we found little evidence to indicate that legislative actions are being informed by the emerging research on virtual schools."[44]
2017	"State legislatures continue to respond to challenges raised by virtual schooling, as evidenced by proposed bills that attempt to increase oversight of virtual schools; however . . . fewer than 40% of proposed bills have been enacted."[45]
2019	"Our analysis revealed a decrease in legislative activity in 2017 and 2018, yet state legislatures have continued to propose bills similar to previous years that attempt to increase oversight of virtual schools."[46]

The year's report finds a continued decrease in legislative activity, with "little evidence to indicate that emerging research is informing legislative action."[47] Sadly, the words "we found little evidence to indicate that emerging research is informing legislative action" appear in every report since 2015.

One area where policymakers have ignored a growing body of literature is funding. As previous reports have indicated, only virtual school operators themselves and ideologically supportive advocacy organizations have insisted that virtual education is more costly than traditional brick-and-mortar schools.[48] Independent researchers have consistently found that virtual schools are less costly than traditional brick-and-mortar schooling.[49] In fact, several

proponents of school choice initiatives have argued that online learning is more cost-efficient,[50] and others have argued the same for blended schools.[51] Yet, there has still been little or no legislative action to meaningfully address the issue of how virtual and blended schools are funded, and for-profit corporate operators continue to earn healthy profits.[52] Even a history of scandals seems to have had little impact on legislative inaction.[53]

In General

The reality is that for the last 10 years, NEPC has produced research reports indicating poor quality of education provided by full-time K-12 virtual schools, and more recently, by blended schools. Report findings have continuously aligned with published research in the broader field. Yet, over that time, state legislators have been largely unwilling to strengthen oversight and accountability. Even when legislation has been proposed, legislators have failed to enact it—even though some school choice advocates themselves have indicated concern about the lack of accountability, potential overfunding, and staffing issues. [54] Critical findings in these areas have been clear for some time, generating the critical question of why the research—both that of NEPC and across the broader field—has had such minimal impact on both practice and policy.

Issues Related to Minimal Research Impact on Policy

This segment examines influences on policymakers and weaknesses in existing research, which both help explain why credible, independent research has not yet substantively shaped legislation and practice.

Influence on Policymakers

As a part of the report *Online Learning: What Every Parent Should Know*, the Network for Public Education wrote:

> Online charter schools, the various governmental agencies and foundations that support digital learning, and the for-profit education technology sector employ an aggressive strategy to encourage popular support and ensure a favorable regulatory environment. There are four main avenues that the for-profit cyber charter companies use to expand and promote weak governmental oversight and regulations: direct lobbying, donations directly to candidates and legislators, involvement with and support of advocacy groups, and advertising.[55]

Often the relationship among for-profit companies, member and policy organizations, lobbyists, advocacy groups, and politicians can get quite messy (see Appendix II-B for a graphic illustration of common interactions).

As noted in the first section of this report, for-profit EMOs accounted for 59.1% of the total enrollment in full-time virtual schools and 25.3% of the total enrollment in blended schools.

These corporations:

- donate money to organizations like the American Legislative Exchange Council (ALEC), where their executives participate in and co-chair committees with elected politicians, drafting model legislation for politicians to introduce in their states;

- donate money to "nonprofit," "nonpartisan" associations, and policy centers that conduct research to support policies included in draft legislation produced by organizations like ALEC;

- hire local, state, and national lobbyists to use research from the "nonprofit," "nonpartisan" associations, and policy centers to attempt to influence politicians to support legislation drafted by organizations like ALEC;

- donate money to create and support local and statewide parent and student advocacy groups to establish grassroots campaigns that support their lobbying efforts, working to persuade politicians to support legislation drafted by organizations like ALEC; and

- donate money directly to the election and re-election campaigns of politicians likely to support legislation drafted by organizations like ALEC, often after professional relationships have been established through lobbying efforts or participation in ALEC events.[56]

Almost a decade ago, reporters at the *Portland Press Herald* examined over a thousand pages of documents obtained through a public records request, allowing them to detail how the generic model described above operated in Maine.[57] Their "investigation found [that] large portions of Maine's digital education agenda are being guided behind the scenes by out-of-state companies that stand to capitalize on the changes, especially the nation's two largest online education providers" (see Appendix II-C for a graphic illustration of the Maine process).

The Maine situation is far from unique; many examples could be used to illustrate how corporations and ideologically driven organizations join forces to influence K-12 virtual and blended learning policy. In another example, the Michigan legislature in 2009 passed *Public Act 205*, which lifted a ban on virtual charter schools and allowed two companies (i.e., Connections Academy and K12 Inc.) to each create one full-time virtual school. Enrollment in each was limited to 400 students in the first year and an additional 1,000 students in the second year. However, for each regular education student registered in year two, each school was required to enroll one student from the state's official list of dropouts. As a part of the legislation, at the end of year two the state's education department was to review each school's performance and adjust enrollment limits appropriately. Table 2.6 details student performance on the Michigan Educational Assessment Program (MEAP) during those first two years, 2010 and 2011. Figures below statewide averages are presented in red.

Table 2.6. Summary of Performance for Michigan Connections Academy (CA) and Michigan Virtual Academy (K12) on 2010 and 2011 MEAPs

MEAP	CA 2010	K12 2010	Statewide 2010	CA 2011	K12 2011	Statewide 2011
Gr 3 – Math	44.0%	14.3%	35%	42.2%	26.3%	36%
Gr 3 – Reading	75.0%	66.7%	63%	64.4%	55.3%	62%
Gr 4 – Math	23.7%	40.0%	40%	37.8%	20.5%	40%
Gr 4 – Reading	71.0%	66.7%	64%	82.2%	56.4%	68%
Gr 4 – Writing	36.8%	48.4%	47%	37.8%	25.6%	45%
Gr 5 – Math	13.9%	32.0%	30%	33.3%	36.8%	40%
Gr 5 – Reading	72.2%	68.0%	65%	77.8%	60.5%	69%
Gr 5 – Science	8.3%	8.0%	17%	18.5%	19.4%	15%
Gr 6 – Math	18.9%	20.0%	36%	19.0%	22.0%	37%
Gr 6 – Reading	75.7%	66.7%	63%	83.3%	70.7%	67%
Gr 6 – Social Studies	21.6%	20.0%	28%	21.4%	26.2%	28%
Gr 7 – Math	34.6%	14.7%	36%	36.2%	34.4%	37%
Gr 7 – Reading	73.1%	47.1%	56%	59.6%	57.4%	60%
Gr 7 – Writing	50.0%	35.3%	48%	38.3%	34.4%	47%
Gr 8 – Math	18.8%	19.1%	29%	-	-	29%
Gr 8 – Reading	65.6%	66.7%	56%	-	-	61%
Gr 8 – Science	12.5%	9.6%	15%	-	-	16%
Gr 9 – Social Studies	34.7%	-	33%	28.1%	24.6%	29%

As indicated in the table, student performance at the Michigan's Connections Academy was lower than the statewide average in eight of 18 areas tested in 2010, and nine of 15 areas tested in 2011. The Michigan Virtual Academy also had poor results, lower than the state average in nine of 17 areas tested in 2010, and 13 of 15 areas tested in 2011. Nevertheless, in the spring of 2011, only months before the mandated Department of Education review, the legislature was persuaded to remove all meaningful restrictions. The state's Senate Bill 619 removed the cap on the number of virtual charter schools in Michigan and limited enrollment going forward for each virtual charter school to 2,500 students in the first year, 5,000 students in the second year and 10,000 students after the second year.

While Michigan offers another example of how influence operates, it also offers an illustration of the potential research does have to influence policy and practice. In 2012 its legislature directed the Michigan Virtual University to create the MVLRI, a state-supported research center. As one of its duties, the institute was to "analyze the effectiveness of online learning delivery models . . . [by] highlighting enrollment totals, completion rates, and the overall impact on pupils."[58] In addition to this specific mandate, Section 98 of the State School Aid Act also directs MVLRI to research ways to strengthen teaching in 19 discrete

areas (see Appendix II=D). While it is debatable how well the MVLRI achieves each of these mandates annually, the 19 discrete topics certainly represent a wide range of issues related to how K-12 virtual and blended learning opportunities might be better designed, delivered, supported, and regulated. Unfortunately, the fact that this institute exists and produces research that *could* inform public policy does not guarantee that it *will*.

As one example, Michigan's *K-12 Virtual Learning Effectiveness Report* for the 2012-13 school year indicated that enrollment in virtual learning had doubled over the prior two years—an unsurprising development, given the removal of all meaningful enrollment restrictions. It also reported that full-time virtual charter schools had significantly higher rates of student withdrawal and a slightly higher rate of student failure than students in brick-and-mortar schools.[59] The following year, the report indicated students in virtual schools still had a completion rate approximately 25% lower than that of students in traditional schools. Interestingly, while full-time virtual charters and district-based supplemental programs performed poorly, students attending the state-funded Michigan Virtual School performed much better.[60] Similarly, the 2014-15 *K-12 Virtual Learning Effectiveness Report* found students in virtual schools and programs had a completion rate approximately 30% lower than that of students in traditional schools, although again, the rate in the Michigan Virtual School was more than 20% better.[61] The two most recent reports also found disappointing pass rates as well. In 2017-18, the pass rate for students in full-time district virtual schools was 47%, while that for students enrolled in other virtual charters was 53%, well below the 79% pass rate for students in brick-and-mortar schools. Similarly, the 2018-19 report found the pass rate for students in district virtual schools to be 51% and for students in virtual charter schools 49%—again, far below the 76% for students in traditional schools.[62]

Given that an independent body was required by law to report this consistently negative data, legislators and policymakers might have been expected to take action to improve the quality of education in full-time virtual charter schools and/or to extend the relative success of the state's own supplemental virtual program. Yet, the next section of this report, focused on policy issues, indicates that none of the five bills introduced or passed in Michigan during the 2019 and 2020 legislative sessions focused on meaningful regulation relative to the poor performance of Michigan's full-time virtual schools, or to any of the other 19 areas that MVLRI must research.

It is evident that the mere existence of a state-funded research center cannot guarantee that its work will shape policy. However, the work of MVLRI has nevertheless surely benefitted practice of virtual and blended education in the state, especially during the time of pandemic emergency remote learning. For example, MVLRI maintains *Michigan's Online Course Catalogue* that lists every online course available to students in the state and provides a description of how the course is taught, which program/vendor offers it, its previous student completion rates, and much more that schools can use when seeking supplemental or full-time virtual offerings for students.[63] In addition, the Institute has developed research-based guides to online learning for students, parents, school-based mentor teachers, online teachers, school board officials, and administrators.[64] It has also provided a research-based tool for school leaders to review online courses,[65] and *Strategies for Online Success* orientation modules for students new to online learning.[66] During the pandemic, MVLRI has provided teachers with access to 17 webinars and over 200 courses for professional learning based

on needs identified in its research,[67] and it also created a series of resources and learning opportunities specific to remote teaching.[68] Finally, in 2020, MVLRI undertook a systematic review of all the research it had produced since 2012 to generate thematic lessons learned for both practitioners and policymakers.[69] So, although legislators and policymakers may not have used MVLRI research to guide their work, teachers and school/district leaders have received significant benefit from the Institute.

Issues in the Research

It would be easy to blame only legislators and policymakers for ignoring existing research. But that would be intellectually dishonest, since researchers themselves are partly responsible for the problem. Scholars have long complained about shortcomings in the work that limit its practical application. For example, 15 years ago one scholar argued that one reason for weak research could be "placed on the doorstep of the research community for a lack of theoretical rationale."[70] Nearly a decade after online learning first expanded, scholars were noting a lack of rigor, with much being research produced by ideological think tanks or found in unpublished graduate theses and dissertations.[71] At the time, some thought the existing work constituted foundational descriptive work that often precedes experimentation in any field.[72] However, in 2015 other researchers noted that the criticism remained valid.[73]

Over the past four years, Farhad (Fred) Saba's critique of the field of distance education has informed a line of inquiry into the state of research into K-12 online and blended learning.[74] In his work, Saba identifies confusing terminology, a lack of historical perspective, absence of construct validity, and a focus on discrete elements rather than systemic relationships as characteristic of research in the field.[75] In addition, the field is characterized by American-centrism.[76] I discuss each of these limitations below.

Confusing Terminology

Over the years, researchers have used a variety of terms to describe education provided wholly or partly online. Some have used terms interchangeably, while others have used multiple terms for the same context. Generally, academics have used "K-12 online learning" to refer to the overall field, "virtual schooling" to refer to supplemental forms of K-12 online learning (with students taking one or more courses online while enrolled in a brick-and-mortar school), and "cyber schooling" to refer to full-time forms of K-12 online learning.[77] However, the International Association for K-12 Online Learning (now the Aurora Institute, but referred to in this report by the better known acronym iNACOL), the main professional association for K-12 online and blended practitioners, defines online learning as "education in which instruction and content are delivered primarily over the Internet," which iNACOL instructs can be used interchangeably with virtual learning, cyber learning, e-learning, virtual school, eSchool, and online school.[78] Such conflated terminology means that researchers cannot compare the results among studies because they simply do not know if the same thing is being compared. As a result, important literature may not be recognized, frustrating efforts to build a field based on what is already known.

Recently, the problem has grown as the COVID-19 pandemic forced schools to rapidly transition to at-home learning. The academic community has generally termed this transition during March and April of 2020 as "emergency remote teaching."

> In contrast to experiences that are planned from the beginning and designed to be online, emergency remote teaching is a temporary shift of instructional delivery to an alternate delivery mode due to crisis circumstances. It involves the use of fully remote teaching solutions for instruction or education that would otherwise be delivered face-to-face or as blended or hybrid courses and that will return to that format once the crisis or emergency has abated. The primary objective in these circumstances is not to re-create a robust educational ecosystem but rather to provide temporary access to instruction and instructional supports in a manner that is quick to set up and is reliably available during an emergency or crisis.[79]

Teachers and schools, legislators and policymakers, and the general media, however, have used a variety of terms to describe newly organized virtual schooling, which has persisted in many places into the 2020-21 school year.

The failure to recognize that much recent K-12 online learning was always intended to be temporary has led to still more confusion about what is known. For example, since January 2020 an *Education Week* series has offered research syntheses intended to be useful to practitioners and policymakers.[80] One article begins, "The times have dictated school closings and the rapid expansion of online education. Can online lessons replace in-school time?"[81] While pandemic conditions are noted as the prompt of the article, the research overviewed was not specific to the temporary context. Instead, it drew on research on various other configurations, including: a teacherless, database-driven online credit recovery program; full-time virtual charter schools; a variety of online credit recovery programs with multiple delivery models, including teacher-led vs. teacherless, summer school vs. regular school year, public vs. for profit EMO, and so on. Only one of the articles surveyed examined any context similar to the home-based experience during the pandemic, that of full-time virtual charter schools. However, even that was a statewide study asking how effective well-established, primarily for-profit virtual schools had been—hardly comparable to a local school district creating an entirely new full-time online program in a matter of days.

Unlike online learning, more easily identified by geographical separation between student and teacher, blended learning is even harder to define.[82] The definition from iNACOL is:

> any time a student learns at least in part at a supervised brick-and-mortar location away from home and at least in part through online delivery with some element of student control over time, place, path, and/or pace; often used synonymously with hybrid learning.[83]

However, this seemingly straightforward definition has often been confounded by "the dynamic and evolving conception of blended learning."[84] For example, consider the variety of terms in the Christensen Institute's taxonomy (see Figure 2.3).

Figure 2.3. Taxonomy of Blended Learning[85]
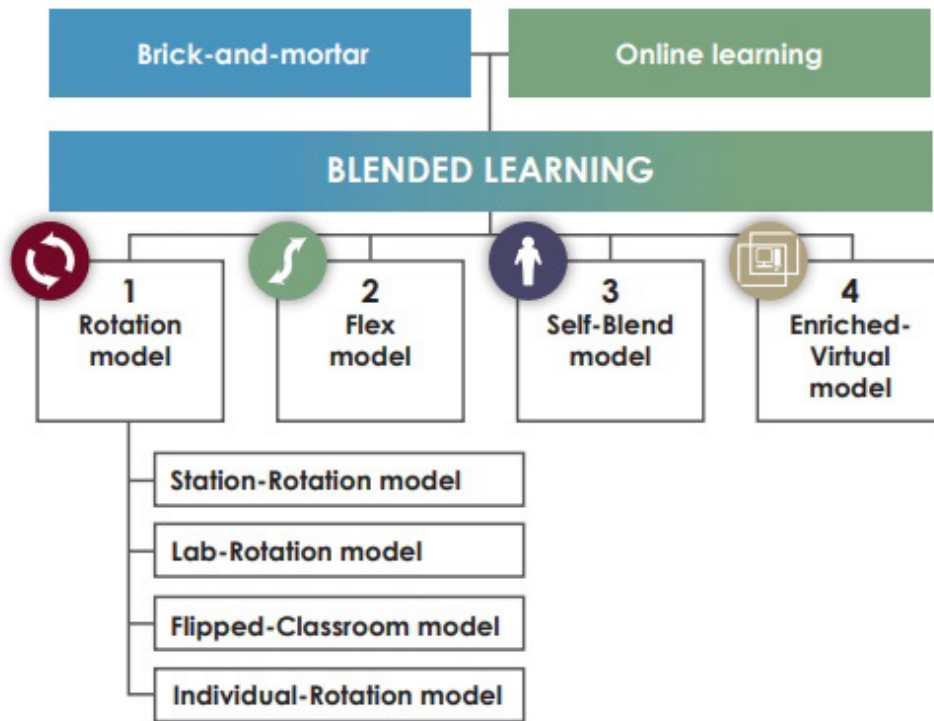
In particular, this model means that "flipped classroom model" research is often not labelled as blended learning, and "enriched virtual model" could be conflated with virtual learning.

Again, the pandemic has introduced another confounding factor in terminology. Many formal definitions—such as the one offered by iNACOL—have suggested that blended learning and hybrid learning are synonyms, but during the pandemic many schools adopted a hybrid model of learning similar to the one illustrated in Figure 2.4.

Figure 2.4. Hybrid Learning Model for Flexible Learning During the Pandemic[86]

Monday	Tuesday	Wednesday	Thursday	Friday
Learning Group A **In-Person**	Learning Group A **In-Person**	**Flex Learning Day** for all students	Learning Group A **Distance Learning**	Learning Group A **Distance Learning**
Learning Group B **Distance Learning**	Learning Group B **Distance Learning**		Learning Group B **In-Person**	Learning Group B **In-Person**

In this hybrid model, students are either engaged in in-person learning or in distance learning—but they have no control over time, place, path, and/or pace, as stipulated in the iNACOL definition. Yet, blended and hybrid are also thought to be interchangeable terms. In still other models, some students are in the classroom (i.e., "roomies"), while others are at home ("i.e., "Zoomies"), and the teacher is in the classroom offering live instruction to

both groups, with lessons being synchronously streamed to the remote students—sometimes called concurrent teaching or co-seating. Figure 2.5 summarizes some of the overlap and inconsistency in the descriptions of the different modalities.

Figure 2.5. Merging Modality Models[87]

	f2f	synchronous concurrent	synchronous consecutive	asynchronous consecutive	open access
Blended (Hybrid)	X		X^	X^	
HyFlex	X*	X*		X*	
Multi-Access	X^	X^	X^	X^	X^
Blended Synchronous (Synchronous Hybrid)	X*	X*			

Note: Asterisk (*) designates where learners have the option to swap between modes. Caret (^) designates where modality or access options exist for learners and may provide options to swap between modes but are dependent on design.

There have even been recent attempts within the literature to synthesize synchronous and asynchronous modalities (see Figure 2.6).

Figure 2.6. Conceptual Model for Bichronous Online Learning[88]
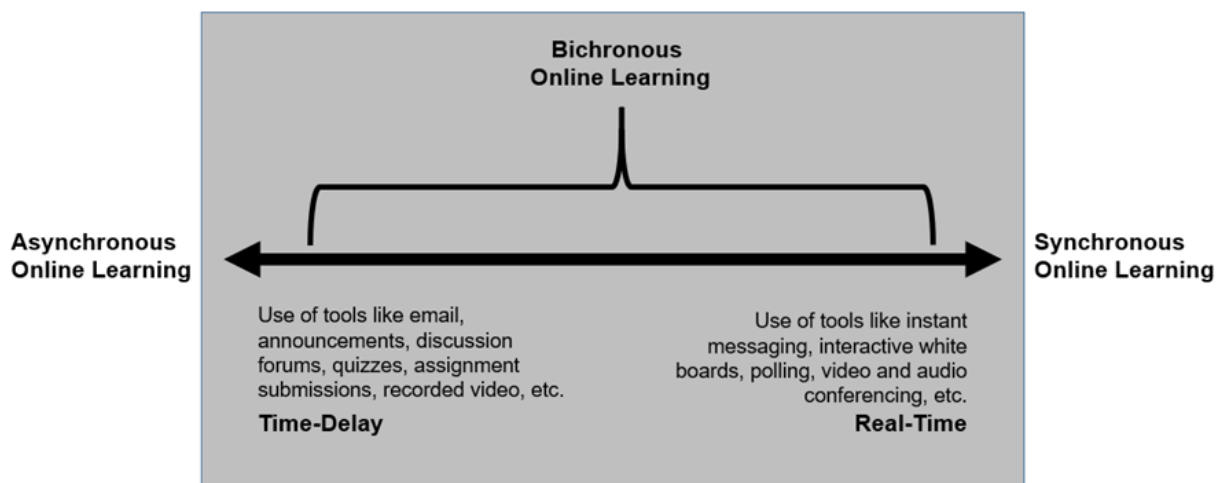
As one researcher summarized, "what used to be a simple binary of face-to-face or online has now become so extremely complex that our ability to understand each other is impaired."[89] The profusion of contested and conflated terms means it is exceedingly difficult for researchers to make meaningful comparisons among different types of contexts and to build a solid, readily accessible literature base. Even worse, practitioners and policymakers are stymied in their efforts to understand what is being found and to use new knowledge to guide their work.

Lack of Historical Perspective

The lack of historical perspective is not a new problem. For example, in the preface to the first edition of the *Handbook of Research on K-12 Online and Blended Learning*, the editors wrote that "although most of the people doing work in the area knew each other (and even occasionally worked together), many new to the field thought that they were discovering K-12 online and blended instruction for the first time."[90] This is an especially concerning issue because so many publishing scholars are new to the field and so much research is published in obscure outlets, as discussed above. Combined with confusing terminology, fragmentation in authors and publications further erodes researchers' ability to situate their own work within the field's origin and conceptual growth. Additionally, practitioners and policymakers turning to ahistorical research may develop a skewed understanding of the field.

As one example, the COVID-19 pandemic is not the first time emergency school closings have has prompted technological innovation in education. During the Spanish flu outbreak in 1918-19, students in Long Beach used the telephone to continue learning as schools closed. Because telephone technology was only 40 years old at the time, "the fact that California students were using it as an educational device was so novel that it made the papers."[91] Historically, school leaders confronted with such emergencies have repeatedly turned to the most popular technology in use at the time. The reliance on new technology, however, means that useful technological strategies refined through experience are typically ignored.

A prime example of a well-developed, successful distance learning strategy is correspondence: paper packets of educational materials mailed to students for use at home. In 2009, after H1N1 influenza forced nearly 750 schools to close, affecting nearly half a million students, researchers looking to history for lessons found that during the Spanish flu pandemic, the Los Angeles district created correspondence modules to allow students to continue their education at home, as well as to provide teachers with professional learning opportunities. Scholars citing the event in a 2020 article noted that "Los Angeles offers an interesting model for contemporary schools interested in creating Internet-ready study materials or valuable professional activities for instructors in the advent of school closure." [92] Recently, the Los Angeles district leaders innovated again by turning to an older technology for distance learning: television. Even before any schools were closed in March, 2020, the Los Angeles Unified School district announced a plan with a Southern California Public Broadcasting System station to draw educational programming from its library for daily broadcast, providing instruction for students throughout the school day.[93]

While some jurisdictions struggled with getting devices into the hands of students and/or the ability of students to connect devices to the internet, a few used the lessons—and tools—of the past to overcome obstacles. However, when research routinely fails to highlight useful lessons from the past, policymakers are left to focus solely upon new, shiny technology and to hope that one day research catches up.

Absence of Construct Validity

Essentially, construct validity is how well something measures what it is designed to measure. To date, efforts have been made to validate only three measurement tools in the field of K-12 online and blended learning: the Educational Success Prediction Instrument; the Parental Involvement Mechanisms Model Instrument; and the K-12 Blended Teaching Readiness Instrument.[94] Because validated instruments are the building blocks for models—and eventually conceptual and theoretical frameworks—the lack of validated instruments useful to the field has inhibited development of theory.

Some researchers have made limited use of theories from other fields,[95] but "theoretical work takes place against a background of disciplinary assumptions that may not be evident to those seeking to import a theory."[96] For example, theories from the broader field of distance, online, and blended learning are often based on adult learners, who are very different from adolescents and children in their orientation to learning. This lack of explanatory models and theories is crucial, because they are central to the creation of new knowledge. In addition, they often provide a common language and focus for specific scholarly communities.[97]

Lacking validated instruments, then, research in the field of K-12 online and blended learning has been largely atheoretical, problematic because "we must make sure that what is passing as good theory includes a plausible, cogent explanation for why we should expect certain relationships in our data."[98] Theory helps advance a field as it "seeks to achieve progress in solving problems . . . [and should] be developed to uniquely fit the needs of the field and [should] be particularly adept at attending to the concerns of . . . practitioners and scholars."[99] To date, the only theory development relative to this field has been the Academic Communities of Engagement (ACE) framework.[100]

Unsurprisingly, vendors have stepped into this void to play a significant role in driving adoption of their tools and pedagogies. Even as corporations confidently promote internal research on their products, however, their practice shows little regard for the reliability, validity, or independence of their work.[101] Experience with corporate-produced curriculum argues persuasively that any measurement tools they produce should be viewed with heavy skepticism.

NEPC researchers have long expressed concerns about the role of corporate vendors in the K-12 classroom. A decade ago, for example, a report on school commercialism for the 2010-11 school year included a discussion of both Shell Oil Company's "Energize Your Future" curriculum that portrayed the company as a leader in alternative technologies, and the American Coal Foundation's "The United States of Energy" fourth-grade curriculum that

emphasized several states' use and production of coal. [102] In each case, corporate image and interests were prioritized over facts. Eventually, a coalition of advocacy groups succeeded in pressuring Scholastic to stop publishing the latter and to vow to pull back generally from publishing corporate-sponsored materials.

While the benefits of coal may seem like an extreme example, the adoption of vendor-created curriculum prior to and during the pandemic has included equally questionable content. For example, activists posted the following bits of online curriculum from vendor Acellus.

> One lesson . . . depicted one animal character asking a pig in make-up why she's called "sweetie lips," to which the pig blushed and replied, "Don't ask. We're not even going there."

> Another lesson asked students, "Osama Bin Laden was the leader of what terrorist group?" One of the multiple-choice answers was "Towelban." Another lesson describing Harriet Tubman's escape from slavery was illustrated with an image of a masked bank robber.[103]

> . . . a first-grade language arts video lesson . . . shows an Acellus instructor teaching about the letter "G." As she pulls something from the box in front of her, she says, "Watch out! Ooh, it's a gun," and removes a silver toy gun.[104]

The Hawaii Department of Education had used this curriculum for over a decade, exposing thousands of students to this kind of content, before any objections were raised.[105] In fact, it wasn't until many school districts adopted the Acellus online curriculum as a response to teachers' need for online content during the pandemic that these examples were exposed. Many districts stopped using the curriculum following the revelations.[106]

Given that policymakers typically turn to whatever materials or tools are most readily available, the lack of validated measurement instruments in the field that so badly needs them is a critical concern. Commercial vendors, who have consistently proven themselves to produce only self-interested educational materials, will be only too happy to fill the void—likely making matters worse if researchers turn to them instead of developing valid instruments themselves.

The Need for a Systems View

In what may be the most developed aspect of his broader critique of the field of distance education, Saba argues that research in the field has too often focused on the discrete components of design, delivery, and support efforts. Instead, Saba has consistently argued that scholars should work to help develop a more comprehensive or systems view of understanding the field.[107] From his perspective, the more a system is broken down into parts, the less is understood about interactions within the whole. Further, when researchers dismiss the big picture, they can develop a kind of monovision, and the individual research fragments they produce can be combined in oppositional ways. And this does appear to be happening; most current research investigates discrete components of design, delivery, and support efforts.

One example of the focus on discrete elements is how iNACOL distinguishes between on-line learning and blended learning—and promotes a personal learning approach assessed through a competency-based education model that uses blended learning pedagogies.[108] The lack of historical perspective described above also promotes monovision, with K-12 online learning researchers ignoring past, successful distance education strategies such as corre-spondence and instructional radio and television. Also ignored is the wealth of research into various forms of technology integration.

In contrast, in designing the ACE Framework, scholars worked toward describing how a K-12 student engages in an online or blended course by exploring the interplay among the student's ability and the affective, behavioral, and cognitive supports provided by both the course and the larger community.[109] That is, they worked to build an understanding of the student within the education system in its entirety. Unfortunately, research into the discrete elements has been and continues to be the dominant focus of research in the field to date.

The lack of coherence generated by alternative approaches has not only hampered the amount and quality of research in the field, it has also confused or misdirected those want-ing to use it. For example, teacher preparation is based on accepted, research-supported systems. However, together they produce real-world efforts lacking in overall coherence. Asked about motivation, teacher educators would confidently point to the theories of Albert Bandura; asked about instructional design, they would likely refer to Gagné's nine events of instruction. In recent years, SAMR (substitution-augmentation-modification-redefinition) has become the accepted model for helping teachers infuse technology into instruction. These common examples of theories, frameworks, and models are well supported by re-search. Divergent approaches in the research have limited K-12 online and blended learning scholars' ability to undertake the kind of systems thinking evident in the ACE Framework, and these broader education examples.

In fact, so fragmented has the research become that teacher preparation programs cannot even determine what future teachers who may be working in an online or blended environ-ment should be exposed to. A 2011 survey of teacher preparation programs found that only 1.3% of the 522 responding universities indicated any focus on virtual learning;[110] in 2016, the percentage for 363 respondents to the same survey rose to only 4.1%.[111] Despite the fact that teacher preparation programs have had an emphasis on technology integration for de-cades, typically focusing on online tools and curriculum, both studies found fewer than 5% of the teacher education programs surveyed reported having any content specifically de-signed to prepare teachers for work in K-12 online and blended environments.

One reason is that the vast majority of such programs include a stand-alone course for tech-nology integration,[112] rather than integrating or infusing instruction throughout the program (as is recommended by the U.S. Department of Education[113])—making the topic a discrete element of a fragmented program rather than part of a unified system of instruction. Under normal circumstances, when only approximately two million K-12 students engage in sup-plemental online learning and an estimated 400,000 K-12 students are enrolled in full-time online learning schools, the lack of preparation affected only a small minority of teachers. However, with the pandemic and the near complete closure of K-12 schools in March 2020, the reality that most teachers were unprepared to facilitate online learning became a prob-

lem for the entire K-12 system.[114] Ignoring that the whole is indeed greater than the sum of its parts has done much to minimize coherent research useful to those seeking guidance.

American-Centrism

The vast majority of scholarship in the field focuses primarily on the U.S. (and, to a lesser extent, North America), even though much K-12 online and blended learning is happening outside it.[115] Evidence includes the analysis of articles in the *Journal of Online Learning Research* discussed earlier, which reported five articles either with no specific geographic focus or for which location could not be determined; however, 91% of all articles with a geographical focus were reporting on the U.S.[116] Following publication of the analysis, the journal's editors acknowledged that they viewed the "finding as an opportunity to better focus on international research and launched the international section in the last issue."[117] Nevertheless, since the editors made this statement, only a single article has had an international focus.[118] There is no intention here to single out the *Journal of Online Learning Research*. As also noted above, researchers who compiled the data set allowing for this analysis themselves concluded one of the reasons some articles received few citations was that they focused on programs or were published in outlets outside of the U.S.[119] Further, an earlier analysis of articles published in the *American Journal of Distance Education* (U.S.), *Distance Education* (Australia), the *Journal of Distance Education* (Canada), and the *Journal of Distance Learning* (New Zealand) from 2006 to 2010 reported that over half of the 24 articles published in these journals focused on the U.S. as well.[120] This limitation has been both consistent and pervasive.

Again, such restricted vision limited responses to school closings during Spring 2020, with media widely questioning schools' and educators' preparedness to shift to a full-time online environment: "How prepared are teachers, parents for remote learning?" or "'We just weren't prepared': Knox County Schools superintendent on coronavirus shutdown" or "New York's Andrew Cuomo asked why the country wasn't ready for a mass shift to online education."[121] Such concerns continued into the fall as schools began to reopen for the 2020-21 school year, asking similar question like, "As districts return to remote learning, are they any better prepared?"[122] Over the past decade, many have called for online learning as a remedy for short-term closures like snow days.[123] Why *weren't* U.S. schools better prepared to react to the pandemic?

It is likely that at least part of the answer to that question is that since U.S. researchers were pursuing their own fragmented, U.S.-centric agenda, they failed to take much notice of activities in other countries—some of which had been preparing for emergency situations as early as 2010.

> In Singapore online and blended learning was so pervasive that teaching in online and virtual environments was a required course in their teacher education programs and schools are annually closed for week-long periods to prepare the K-12 system for pandemic or natural disaster forced closures.[124]

Similarly, a 2011 report from iNACOL detailed how a number of private schools in Bolivia

developed virtual classrooms and trained teachers for that environment following high absenteeism during the H1N1 influenza pandemic of 2009.[125] The same report noted the public school systems in places like Hong Kong and Singapore had followed a similar trend. Perhaps Hong Kong was the first to identify the need when schools closed due to the SARS outbreak in 2003 and emergency remote learning was implemented.[126] Afterward, schools began planning for a more formal use of online learning for future disruptions. When the H1N1 outbreak in 2008 closed schools, online learning provided continuity for some 560,000 students.[127] Similarly, scholars at the University of Canterbury in Christchurch, New Zealand described how remote learning was used in "the immediate post-earthquake challenges of redesigning courses using different blends of face-to-face and online activities to meet the needs of on-campus, regional campus, and distance pre-service teacher education students."[128]

This is not to suggest that jurisdictions like Singapore, Bolivia, Hong Kong, or New Zealand are geographically or educationally similar to the U.S. However, each illustration demonstrates how a pandemic or natural disaster led policymakers to examine their education systems, along with the opportunities and limitations of their geography, to develop and execute a plan for future short-term and long-term disruptions. Historically, policymakers in the U.S. have been fond of adopting educational policy shown to be successful in international jurisdictions. Had more attention been paid to virtual and blended learning experience outside the U.S., as well as to earlier experiences within it, practitioners and policymakers might have developed initiative and strategies for their own education disaster planning.

Summary and Recommendations

Research from NEPC has aligned with literature in the broader field of K-12 online and blended learning by consistently finding that students in both virtual and blended schools generally underperform their counterparts in brick-and-mortar schools, even as those schools serve fewer at-risk students than traditional schools.

Virtual and blended education have nevertheless continued to grow, outpacing the availability of useful research. However, even in areas where the literature has provided guidance, legislators and policymakers have consistently failed to act to impose additional oversight and accountability—even as the MVLRI made good data and useful information available to practitioners and leaders, concretely demonstrating the potential for research to help shape good practice.

Both the available literature and investigative journalism have demonstrated that a main reason legislators and policymakers ignore the research is that corporations and ideologically driven individuals and organizations wield significant influence by generously funding select activities and persons. It would be dishonest, however, to say that these advocates were solely to blame. Recent scholarship has indicated that research into K-12 online and blended learning is still immature; researchers have not yet been able to build a credible base to provide practitioners with a solid body of strategies to adopt. The confusion, fragmentation, incoherence, and limited vision in the research base allows professional associations and nonpartisan organizations to choose selectively among often oppositional alternatives, al-

lowing policymakers to ignore research that doesn't support their own beliefs. In addition, the lack of a credible research base exacerbated difficulties when the COVID-19 pandemic forced abrupt school closings and rapid shift to online instruction in 2020.

Given these factors, it is recommended that:

- State and federal legislators create goals for a comprehensive research program designed to help develop policy for, and improve practice in, virtual and blended schools.

- State and federal legislators either create new independent entities, or support existing ones, charged with undertaking long-term research programs to evaluate virtual and blended schools.

- Researchers in the field design future efforts with a focused effort to avoid known limitations in existing literature.

Notes and References Section II

1 Barbour, M.K. (2011). The promise and the reality: Exploring virtual schooling in rural jurisdictions. *Education in Rural Australia, 21*(1), 1-20.

2 Friend, B., & Johnston, S. (2005). Florida virtual school: A choice for all students. In Z.L. Berge & T. Clark (Eds.), *Virtual schools: Planning for success* (pp. 97-117). Teachers College Press.

   Pape, L., Adams, R., & Ribeiro, C. (2005). The virtual high school: Collaboration and online professional development. In Z.L. Berge & T. Clark (Eds.), *Virtual schools: Planning for success* (pp. 118-132). Teachers College Press.

3 "Packard, 45, a former banker and McKinsey & Co. consultant, founded K12 in April 2000 and got it off the ground with $40 million in venture capital from such sources as Andrew Tisch of the Loews billionaire family, Larry Ellison of Oracle and Knowledge Universe, a for-profit education conglomerate chaired by Michael Milken."

   Randall, D.K. (2008, July 24). Virtual schools, real businesses. *Forbes*. Retrieved January 19, 2021, from https://www.forbes.com/forbes/2008/0811/084.html

   "The Connections Academy got its start in 2001 with the first virtual schools beginning in Wisconsin and Colorado."

   Henry, B. (2017, October 31). Schools of the future: Inside Alabama's virtual public school. *WFSA12 News*. Retrieved January 19, 2021, from https://www.wsfa.com/story/36719023/schools-of-the-future-inside-alabamas-virtual-public-school/

4 Arnesen, K.T., Hveem, J., Short, C.R., West, R., & Barbour, M.K. (2019). K-12 online learning journal articles: Trends from two decades of scholarship. *Distance Education, 40*(1), 32-53.

   The complete data set for this project is available at https://tinyurl.com/K12OnlineLearningData

5 Molnar, A. (Ed.); Miron, G., Huerta, L., Cuban, L., Horvitz, B., Gulosino, C., Rice, J.K., & Shafer, S.R. (2013). *Virtual schools in the U.S. 2013: Politics, performance, policy, and research evidence* (p. i). National Education Policy Center. Retrieved January 5, 2021, from http://nepc.colorado.edu/publication/virtual-schools-annual-2013

6 Kennedy, K., & Ferdig, R.E. (2018). *Handbook of research on K-12 online and blended learning* (2nd ed.) (p. xii). Entertainment Technology Center Press, Carnegie Mellon University. Retrieved February 27, 2021, from https://figshare.com/articles/Handbook_of_Research_on_K-12_Online_and_Blended_Learning_Second_Edition_/6686813

7 Barbour, M.K. (2018). A history of K-12 distance, online, and blended learning worldwide. In K. Kennedy & R.E. Ferdig (Eds.), *Handbook of research on K-12 online and blended learning* (2nd ed.) (pp. 21-40). Entertainment Technology Center Press, Carnegie Mellon University . Retrieved February 27, 2021, from https://figshare.com/articles/Handbook_of_Research_on_K-12_Online_and_Blended_Learning_Second_Edition_/6686813

   Rice, K., & Skelcher, S. (2018). History of policies in K-12 online and blended learning. In K. Kennedy & R.E. Ferdig (Eds.), *Handbook of research on K-12 online and blended learning* (2nd ed.) (pp. 41-64). Entertainment Technology Center Press, Carnegie Mellon University . Retrieved February 27, 2021, from https://figshare.com/articles/Handbook_of_Research_on_K-12_Online_and_Blended_Learning_Second_Edition_/6686813

   Schwirzke, K., Vashaw, L., & Watson, J. (2018). A history of K-12 online and blended instruction in the United States. In K. Kennedy & R.E. Ferdig (Eds.), *Handbook of research on K-12 online and blended learning* (2nd

ed.) (pp. 7-20). Entertainment Technology Center Press, Carnegie Mellon University. Retrieved February 27, 2021, from https://figshare.com/articles/Handbook_of_Research_on_K-12_Online_and_Blended_Learning_Second_Edition_/6686813

8   Clark, T. (2018). Program evaluation in K-12 online & blended learning. In K. Kennedy & R.E. Ferdig (Eds.), *Handbook of research on K-12 online and blended learning* (2nd ed.) (pp. 121-132). Entertainment Technology Center Press, Carnegie Mellon University. Retrieved February 27, 2021, from https://figshare.com/articles/Handbook_of_Research_on_K-12_Online_and_Blended_Learning_Second_Edition_/6686813

Lokey-Vega, A., Jorrín-Abellán, I.M., & Pourreau, L. (2018). Theoretical perspectives in K-12 online learning. In K. Kennedy & R.E. Ferdig (Eds.), *Handbook of research on K-12 online and blended learning* (2nd ed.) (pp. 65-90). Entertainment Technology Center Press, Carnegie Mellon University. Retrieved February 27, 2021, from https://figshare.com/articles/Handbook_of_Research_on_K-12_Online_and_Blended_Learning_Second_Edition_/6686813

Lowes, S., & Lin, P. (2018). A brief look at the methodologies used in the research on online teaching and learning. In K. Kennedy & R. Ferdig (Eds.), *Handbook of research on K-12 online and blended learning* (2nd ed.) (pp. 91-110). Entertainment Technology Center Press, Carnegie Mellon University. Retrieved February 27, 2021, from https://figshare.com/articles/Handbook_of_Research_on_K-12_Online_and_Blended_Learning_Second_Edition_/6686813

Mohammed, S.S. (2018). Measurement in emerging learning environments. In K. Kennedy & R. Ferdig (Eds.), *Handbook of research on K-12 online and blended learning* (2nd ed.) (pp. 111-120). Entertainment Technology Center Press, Carnegie Mellon University. Retrieved February 27, 2021, from https://figshare.com/articles/Handbook_of_Research_on_K-12_Online_and_Blended_Learning_Second_Edition_/6686813

9   Arnesen, K.T., Hveem, J., Short, C.R., West, R., & Barbour, M.K. (2019). K-12 online learning journal articles: Trends from two decades of scholarship. *Distance Education, 40*(1), 32-53.

10   Hu, M., Arnesen, K., Barbour, M.K., & Leary, H. (2019). A newcomer's lens: A look at K-12 online and blended learning in the *Journal of Online Learning Research*. *Journal of Online Learning Research, 5*(2), 123-144. Retrieved January 19, 2021, from https://www.learntechlib.org/primary/p/195231/

11   Arnesen, K., Walters, S., Barbour, M.K., & Borup, J. (2020). Irrelevant, overlooked, or lost? Trends in 20 years of uncited and low cited K-12 online learning articles. *Online Learning, 24*(2), 187-206. Retrieved January 19, 2021, from https://olj.onlinelearningconsortium.org/index.php/olj/article/view/2080

12   Arnesen, K., Walters, S., Barbour, M.K., & Borup, J. (2020). Irrelevant, overlooked, or lost? Trends in 20 years of uncited and low cited K-12 online learning articles (p.187). *Online Learning, 24*(2), 187-206. Retrieved January 19, 2021, from https://olj.onlinelearningconsortium.org/index.php/olj/article/view/2080

13   For a good summary of the latest research into student performance in full-time K-12 online learning environments, see:

Barbour, M.K., Mann, B., & Melchior, S. (2018). *CASTLE Brief No. 2 – A virtual shortfall: How full-time online learning models are not living up to the promise*. University Council for Educational Administration's Center for the Advanced Study of Technology Leadership in Education. Retrieved January 6, 2021, from https://static1.squarespace.com/static/528fd1d3e4b023ca755e1561/t/5c51dfe340ec9aeb-41f03940/1548869604563/2018+-+CASTLE+Brief+02+-+Barbour+Mann+Melchior.pdf

For a good summary of the lack of approval and evaluation regulations in each state, see:

Barbour, M.K., Clark, T., DeBruler, K., & Bruno, J.A. (2016). Evaluation and approval constructs for online and blended courses and providers: A national overview. *Journal of Applied Educational and Policy Research, 2*(1), 32-47. Retrieved January 6, 2021, from https://journals.uncc.edu/jaepr/article/view/469

14   Glass, G.V., Welner, K.G., & Bathon, J. (2011). *Online K-12 schooling in the U.S.: Uncertain private ventures in need of public regulation* (p. i). National Education Policy Center. Retrieved January 5, 2021, from http://nepc.colorado.edu/publication/online-k-12-schooling

15   Miron, G., & Urschel, J.L. (2012). *Understanding and improving full-time virtual schools: A study of student characteristics, school finance, and school performance in schools operated by K12 Inc.* National Education Policy Center. Retrieved January 5, 2021, from http://nepc.colorado.edu/publication/understanding-improving-virtual

16   Molnar, A. (Ed.); Miron, G., Huerta, L., Cuban, L., Horvitz, B., Gulosino, C., Rice, J.K., & Shafer, S.R. (2013). *Virtual schools in the U.S. 2013: Politics, performance, policy, and research evidence*. National Education Policy Center. Retrieved January 5, 2021, from http://nepc.colorado.edu/publication/virtual-schools-annual-2013

17   Molnar, A. (Ed.); Rice, J.K., Huerta, L., Shafer, S.R., Barbour, M.K., Miron, G., Gulosino, C., & Horvitz, B. (2014). *Virtual schools in the U.S. 2014: Politics, performance, policy, and research evidence* (p. 3). National Education Policy Center. Retrieved January 5, 2021, from http://nepc.colorado.edu/publication/virtual-schools-annual-2014

18   Molnar, A. (Ed.); Huerta, L., Barbour, M.K., Miron, G., Shafer, S.R., & Gulosino, C. (2015). *Virtual schools in the U.S. 2015: Politics, performance, policy, and research evidence* (p. iii). National Education Policy Center. Retrieved January 5, 2021, from http://nepc.colorado.edu/publication/virtual-schools-annual-2015

19   Miron, G., & Gulosino, C. (2016). *Virtual schools report 2016: Directory and performance review* (p. 5). National Education Policy Center. Retrieved January 5, 2021, from http://nepc.colorado.edu/publication/virtual-schools-annual-2016

20   Molnar, A. (Ed.); Miron, G., Gulosino, C., Shank, C., Davidson, C., Barbour, M.K., Huerta, L., Shafter, S.R., Rice, J.K., & Nitkin, D. (2017). *Virtual schools in the U.S. 2017* (p. 3). National Education Policy Center. Retrieved January 5, 2021, from http://nepc.colorado.edu/publication/virtual-schools-annual-2017

21   Miron, G., Shank, C., & Davidson, C. (2018). *Full-time virtual and blended schools: Enrollment, student characteristics, and performance* (pp. 5-6). National Education Policy Center. Retrieved January 5, 2021, from http://nepc.colorado.edu/publication/virtual-schools-annual-2018

22   Molnar, A. (Ed.); Miron, G., Elgeberi, N., Barbour, M.K., Huerta, L., Shafer, S.R., & Rice, J.K. (2019). *Virtual schools in the U.S. 2019* (p. 33). National Education Policy Center. Retrieved January 5, 2021, from http://nepc.colorado.edu/publication/virtual-schools-annual-2019

23   See page 34 in Section I – Full-Time Virtual and Blended Schools: Enrollment, Student Characteristics, and Performance.

24   Mann, B., & Baker, D.P. (2019). Cyber charter schools and growing resource inequality among public districts: Geospatial patterns and consequences of a statewide choice policy in Pennsylvania, 2002–2014. *American Journal of Education, 125*(2), 147-171.

25   Molnar, A. (Ed.); Miron, G., Huerta, L., Cuban, L., Horvitz, B., Gulosino, C., Rice, J.K., & Shafer, S.R. (2013). *Virtual schools in the U.S. 2013: Politics, performance, policy, and research evidence* (pp. 26-28). National Education Policy Center. Retrieved January 5, 2021, from http://nepc.colorado.edu/publication/virtual-schools-annual-2013

26   Molnar, A. (Ed.); Rice, J.K., Huerta, L., Shafer, S.R., Barbour, M.K., Miron, G., Gulosino, C., & Horvitz, B. (2014). *Virtual schools in the U.S. 2014: Politics, performance, policy, and research evidence* (pp. 63-65). National Education Policy Center. Retrieved January 5, 2021, from http://nepc.colorado.edu/publication/virtual-schools-annual-2014

27   Molnar, A. (Ed.); Huerta, L., Barbour, M.K., Miron, G., Shafer, S.R., & Gulosino, C. (2015). *Virtual schools in*

the U.S. 2015: Politics, performance, policy, and research evidence (pp. 67-70). National Education Policy Center. Retrieved January 5, 2021, from http://nepc.colorado.edu/publication/virtual-schools-annual-2015

28 Miron, G., & Gulosino, C. (2016). *Virtual schools report 2016: Directory and performance review* (pp. 14-18). National Education Policy Center. Retrieved January 5, 2021, from http://nepc.colorado.edu/publication/virtual-schools-annual-2016

29 Molnar, A. (Ed.); Miron, G., Gulosino, C., Shank, C., Davidson, C., Barbour, M.K., Huerta, L., Shafter, S.R., Rice, J.K., & Nitkin, D. (2017). *Virtual schools in the U.S. 2017* (pp. 19-23). National Education Policy Center. Retrieved January 5, 2021, from https://nepc.colorado.edu/publication/virtual-schools-annual-2017

30 Miron, G., Shank, C., & Davidson, C. (2018). *Full-time virtual and blended schools: Enrollment, student characteristics, and performance* (pp. 20-24). National Education Policy Center. Retrieved January 5, 2021, from http://nepc.colorado.edu/publication/virtual-schools-annual-2018

31 Molnar, A. (Ed.); Miron, G., Elgeberi, N., Barbour, M.K., Huerta, L., Shafer, S.R., & Rice, J.K. (2019). *Virtual schools in the U.S. 2019* (pp. 22-26). National Education Policy Center. Retrieved January 5, 2021, from http://nepc.colorado.edu/publication/virtual-schools-annual-2019

32 Miron, G., & Gulosino, C. (2016). *Virtual schools report 2016: Directory and performance review* (p. 5). National Education Policy Center. Retrieved January 5, 2021, from http://nepc.colorado.edu/publication/virtual-schools-annual-2016

33 Molnar, A. (Ed.); Miron, G., Gulosino, C., Shank, C., Davidson, C., Barbour, M.K., Huerta, L., Shafter, S.R., Rice, J.K., & Nitkin, D. (2017). *Virtual schools in the U.S. 2017* (p. 3). National Education Policy Center. Retrieved January 5, 2021, from http://nepc.colorado.edu/publication/virtual-schools-annual-2017

34 Miron, G., Shank, C., & Davidson, C. (2018). *Full-time virtual and blended schools: Enrollment, student characteristics, and performance* (pp. 5-6). National Education Policy Center. Retrieved January 5, 2021, from http://nepc.colorado.edu/publication/virtual-schools-annual-2018

35 Molnar, A. (Ed.); Miron, G., Elgeberi, N., Barbour, M.K., Huerta, L., Shafer, S.R., & Rice, J.K. (2019). *Virtual schools in the U.S. 2019* (p. 33). National Education Policy Center. Retrieved January 5, 2021, from http://nepc.colorado.edu/publication/virtual-schools-annual-2019

36 See page 34 in Section I – Full-Time Virtual and Blended Schools: Enrollment, Student Characteristics, and Performance.

37 Miron, G., & Gulosino, C. (2016). *Virtual schools report 2016: Directory and performance review* (pp. 14-18). National Education Policy Center. Retrieved January 5, 2021, from http://nepc.colorado.edu/publication/virtual-schools-annual-2016

38 Molnar, A. (Ed.); Miron, G., Gulosino, C., Shank, C., Davidson, C., Barbour, M.K., Huerta, L., Shafter, S.R., Rice, J.K., & Nitkin, D. (2017). *Virtual schools in the U.S. 2017* (pp. 19-23). National Education Policy Center. Retrieved January 5, 2021, from http://nepc.colorado.edu/publication/virtual-schools-annual-2017

39 Miron, G., Shank, C., & Davidson, C. (2018). *Full-time virtual and blended schools: Enrollment, student characteristics, and performance* (pp. 20-24). National Education Policy Center. Retrieved January 5, 2021, from http://nepc.colorado.edu/publication/virtual-schools-annual-2018

40 Molnar, A. (Ed.); Miron, G., Elgeberi, N., Barbour, M.K., Huerta, L., Shafer, S.R., & Rice, J.K. (2019). *Virtual schools in the U.S. 2019* (pp. 22-26). National Education Policy Center. Retrieved January 5, 2021, from http://nepc.colorado.edu/publication/virtual-schools-annual-2019

41 Barbour, M.K. (2009). Today's student and virtual schooling: The reality, the challenges, the promise... *Journal of Distance Learning, 13*(1), 5-25.

Hurley, R. (2002). Fine-tuning an online high school to benefit at-risk students. *T.H.E. Journal, 30*(4), 33-34, 36, 38, 40.

Klein, C. (2006). *Virtual charter schools and home schooling*. Cambria Press.

Rapp, K.E., Eckes, S.E., & Plurker, J.A. (2006). Cyber charter schools in Indiana: Policy implications of the current statutory language. *Education Policy Brief, 4*(3). Retrieved January 5, 2021, from https://files.eric.ed.gov/fulltext/ED490889.pdf

Watson, J.F., Gemin, B., & Ryan, J. (2008). *Keeping pace with k–12 online learning: A review of state-level policy and practice*. Evergreen Consulting Associates. Retrieved January 5, 2021, from https://static1.squarespace.com/static/59381b9a17bffc68bf625df4/t/5949b57fb3db2bd59bcb124b/1498002820345/KeepingPace+2008.pdf/

42   Molnar, A. (Ed.); Miron, G., Huerta, L., Cuban, L., Horvitz, B., Gulosino, C., Rice, J.K., & Shafer, S.R. (2013). *Virtual schools in the U.S. 2013: Politics, performance, policy, and research evidence* (p. 37). National Education Policy Center. Retrieved January 5, 2021, from http://nepc.colorado.edu/publication/virtual-schools-annual-2013

43   Molnar, A. (Ed.); Rice, J.K., Huerta, L., Shafer, S. R., Barbour, M.K., Miron, G., Gulosino, C., & Horvitz, B. (2014). *Virtual schools in the U.S. 2014: Politics, performance, policy, and research evidence* (p. 6). National Education Policy Center. Retrieved January 5, 2021, from http://nepc.colorado.edu/publication/virtual-schools-annual-2014

44   Molnar, A. (Ed.); Huerta, L., Barbour, M.K., Miron, G., Shafer, S.R., & Gulosino, C. (2015). *Virtual schools in the U.S. 2015: Politics, performance, policy, and research evidence* (p. 4). National Education Policy Center. Retrieved January 5, 2021, from http://nepc.colorado.edu/publication/virtual-schools-annual-2015

45   Molnar, A. (Ed.); Miron, G., Gulosino, C., Shank, C., Davidson, C., Barbour, M.K., Huerta, L., Shafter, S.R., Rice, J.K., & Nitkin, D. (2017). *Virtual schools in the U.S. 2017* (p. 76). National Education Policy Center. Retrieved January 5, 2021, from http://nepc.colorado.edu/publication/virtual-schools-annual-2017

46   Molnar, A. (Ed.); Miron, G., Elgeberi, N., Barbour, M.K., Huerta, L., Shafer, S.R., & Rice, J.K. (2019). *Virtual schools in the U.S. 2019*. (p. 84). National Education Policy Center. Retrieved January 5, 2021, from http://nepc.colorado.edu/publication/virtual-schools-annual-2019

47   See page 83 in Section III – Key Policy Issues in Virtual Schools: Finance and Governance, Instructional Quality, and Teacher Quality.

48   Anderson, A., Augenblick, J., DeCescre, D., & Conrad, J. (2006). *20/20 costs and funding of virtual schools*. BellSouth Foundation. Retrieved January 19, 2021, from https://www.heartland.org/_template-assets/documents/publications/28390.pdf

Bailey, J., Schneider, C., & Vander Ark, T. (2013). *Funding students, options, and achievement*. Foundation for Excellence in Education. Retrieved January 19, 2021, from http://digitallearningnow.com/site/uploads/2014/05/Funding-Paper-Final.pdf

Hausner, L. (2004). *Estimated cost of operating a cyberschool in Colorado*. Donnell-Kay Foundation.

Patrick, S., Myers, J., Silverstein, J., Brown, A., & Watson, J. (2015). *Performance-based funding & online learning: Maximizing resources for student success*. International Association for K-12 Online Learning. Retrieved January 19, 2021, from https://aurora-institute.org/resource/performance-based-funding-online-learning-maximizing-resources-for-student-success/

Watson, J., & Gemin, B. (2009). *Promising practices in online learning: Policy and funding frameworks for online learning*. International Association for K-12 Online Learning. Retrieved January 19, 2021, from http://files.eric.ed.gov/fulltext/ED509634.pdf

49   Baker, B.D., & Bathon, J. (2012). *Financing online education and virtual schooling: A guide for policymakers and advocates*. National Education Policy Center. Retrieved January 19, 2021, from http://nepc.colorado.edu/publication/financing-online-education

Barbour, M.K. (2012). Point: Virtual schools are more cost-effective compared to traditional, brick-and-mortar schools. In K.P. Brady (Ed.), *Technology in Schools: Debating Issues in American Education* (pp. 84-90). Sage.

DeJarnatt, S.L. (2013). Keeping following the money: Financial accountability and governance of cyber charter schools. *The Urban Lawyer, 45*(4), 915-951.

Ohio Legislative Committee on Education Oversight. (2005). *The operating costs of Ohio's eCommunity schools*.

50   Butler Battaglino, T., Haldeman, M., & Laurans, E. (2012). *The costs of online learning*. The Thomas B. Fordham Institute. Retrieved January 5, 2021, from http://edex.s3-us-west-2.amazonaws.com/publication/pdfs/20120110-the-costs-of-online-learning_7.pdf

Hassel, B.C., Ayscue Hassel, E., Hess, F.M., Butler Battaglino, T., Haldeman, M., Laurans, E., Hill, P.T., & Chubb, J.E. (2012). *Education reform for the digital era*. The Thomas B. Fordham Institute. Retrieved January 5, 2021, from https://fordhaminstitute.org/national/research/education-reform-digital-era

Horn, M.B. (2013). Beyond good and evil: Understanding the role of for-profits in education through the theories of disruptive innovation. In F.M. Hess & M.B. Horn (Eds.), *Private enterprise and public education* (pp. 100-120). Teachers College Press.

51   Hassel, B.C., Ayscue Hassel, E., Hess, F.M., Butler Battaglino, T., Haldeman, M., Laurans, E., Hill, P.T., & Chubb, J.E. (2012). *Education reform for the digital era*. The Thomas B. Fordham Institute. Retrieved January 5, 2021, from https://fordhaminstitute.org/national/research/education-reform-digital-era

52   Eger, A. (2020, February 3). 'Our kids have become a piggy bank': Epic Charter Schools shields $50M in taxpayer funds from public scrutiny. *Tulsa World*. Retrieved January 19, 2021, from https://tulsaworld.com/news/local/education/our-kids-have-become-a-piggy-bank-epic-charter-schools-shields-50m-in-taxpayer-funds/article_445f6458-c147-5efa-ab29-781c72d64011.html

Harris, C. (2018, August 22). Primavera charter CEO gets $8.8M despite having Arizona's third-highest dropout rate. *The Republic*. Retrieved January 19, 2021, from https://www.azcentral.com/story/news/local/arizona-education/2018/08/22/primavera-online-charter-school-ceo-damian-creamer/839045002/

Phillips, A.M. (2019, March 18). Small districts reap big profits by approving charter schools with little oversight. *The Los Angeles Times*. Retrieved January 19, 2021, from https://www.latimes.com/local/education/la-me-edu-charter-school-fees-20190328-story.html

Simply Wall Street. (2019, February 22). *If you had bought K12 shares three years ago you'd have made 232%*. Retrieved January 19, 2021, from https://simplywall.st/stocks/us/consumer-services/nyse-lrn/k12/news/if-you-had-bought-k12-shares-three-years-ago-youd-have-made-232

53   Brenner, K. (2019, August 25). Marin students disrupted by San Diego charter school scandal: Two online charter schools closed by court-appointed receiver. *The Mercury News*. Retrieved January 19, 2021, from https://www.mercurynews.com/2019/08/25/marin-students-disrupted-by-san-diego-charter-school-scandal/

Martinez-Keel, N. (2019, July 17). Epic Charter Schools embezzled millions with 'ghost students,' OSBI says. *Tulsa World*. Retrieved January 19, 2021, from https://tulsaworld.com/news/local/epic-charter-schools-embezzled-millions-with-ghost-students-osbi-says/article_0ea064e8-9631-5d3e-893e-2f61370b6aa9.html

Wang, S. (2019, July 10). 'How did we miss this?' Indiana officials blast lack of oversight in $40M vir-

tual school scandal. *Chalkbeat Indiana*. Retrieved January 19, 2021, from https://in.chalkbeat.org/2019/7/10/21108541/how-did-we-miss-this-indiana-officials-blast-lack-of-oversight-in-40m-virtual-school-scandal

Finally, *Education Week* created an interactive map and detailed listing of all of the full-time virtual school scandals they were able to confirm from 2001 to 2017 that is available at https://www.edweek.org/policy-politics/map-cyber-charters-have-a-new-champion-in-devos-but-struggles-continue

54   Gill, B., Walsh, L., Wulsin, C.S., Matulewicz, H., Severn, V., Grau, E., Lee, A., & Kerwin, T. (2015). *Inside online charter schools*. Mathematica Policy Research. Retrieved January 5, 2021, from https://www.mathematica-mpr.com/~/media/publications/pdfs/education/inside_online_charter_schools.pdf

National Alliance for Public Charter Schools, 50-State Campaign for Achievement Now, & National Association of Charter School Authorizers. (2016). *A call to action to improve the quality of full-time virtual charter public schools*. Retrieved January 5, 2021, from http://www.publiccharters.org/wp-content/uploads/2016/06/Virtuals-FINAL-06202016-1.pdf

Pazhouh, R., Lake, R., & Miller, L. (2015). *The policy framework for online charter schools*. Center on Reinventing Public Education. Retrieved January 5, 2021, from http://www.crpe.org/sites/default/files/crpe-policy-framework-online-charter-schools-final_0.pdf

Rapp, K.E., Eckes, S.E., & Plucker, J.A. (2006). Cyber charter schools in Indiana: Policy implications of the current statutory language. *Education Policy Brief, 4*(3). Retrieved January 5, 2021, from https://files.eric.ed.gov/fulltext/ED490889.pdf

Woodworth, J.L., Raymond, M.E., Chirbas, K., Gonzalez, M., Negassi, Y., Snow, W., & Van Donge, C. (2015). *Online charter school study*. Center for Research on Education Outcomes. Retrieved January 5, 2021, from https://credo.stanford.edu/sites/g/files/sbiybj6481/f/online_charter_study_final.pdf

55   Network for Public Education. (2019). *Online learning: What every parent should know* (p. 13). Retrieved February 21, 2021, from https://npe.wpengine.com/wp-content/uploads/2019/01/Online-Learning-What-Every-Parent-Should-Know.pdf

56   See Rodov, F. (2020, September 24). Online charter schools are not a solution to education in a pandemic. *Nation of Change*. Retrieved March 1, 2021, from https://www.nationofchange.org/2020/09/24/online-charter-schools-are-not-a-solution-to-education-in-a-pandemic/ for several examples of each of these points.

57   Woodward, C. (2012, September 1). Special report: The profit motive behind virtual schools in Maine. *Portland Press Herald*. Retrieved March 1, 2021, from https://www.pressherald.com/2012/09/01/virtual-schools-in-maine_2012-09-02/#

Woodward, C. (2012, September 1). Studies: Existing full-time virtual schools earn poor grades. *Portland Press Herald*. Retrieved March 1, 2021, from https://www.pressherald.com/2012/09/01/studies-existing-full-time-virtual-schools-earn-poor-grades_2012-09-02/#

58   Michigan Virtual University (2013). *2012-13 annual report* (p. 59). Retrieved January 22, 2021, from http://media.mivu.org/institute/pdf/Annual_Report_2013.pdf

59   Freidhoff, J., DeBruler, K., & Kennedy, K. (2014). *Michigan's K-12 virtual learning effectiveness report*. Michigan Virtual Learning Research Institute. Retrieved March 30, 2017, from https://michiganvirtual.org/research/publications/michigans-k-12-virtual-learning-effectiveness-report-2010-13/

60   Freidhoff, J. (2015). *Michigan's K-12 virtual learning effectiveness report 2013-14*. Michigan Virtual Learning Research Institute. Retrieved March 30, 2017, from http://media.mivu.org/institute/pdf/er_2014.pdf

61   Freidhoff, J. (2016). *Michigan's K-12 virtual learning effectiveness report 2014-15*. Michigan Virtual Learning Research Institute. Retrieved March 30, 2017, from http://media.mivu.org/institute/pdf/er_2015.pdf

62 Freidhoff, J.R. (2020). *Michigan's K-12 virtual learning effectiveness report 2018-19*. Michigan Virtual University. Retrieved January 22, 2021, from https://michiganvirtual.org/research/publications/michigans-k-12-virtual-learning-effectiveness-report-2018-19/

Freidhoff, J.R. (2019). *Michigan's K-12 virtual learning effectiveness report 2017-18*. Michigan Virtual University. Retrieved January 22, 2021, from https://mvlri.org/research/publications/michigans-k-12-virtual-learning-effectiveness-report-2017-18/

63 See https://micourses.org/ to access *Michigan's Online Course Catalogue*.

64 See https://michiganvirtual.org/resources/guides/ to access these various *Guides to Online Learning*.

65 Gieseking, T., & Harrington, C. (2020). *Guide for online course review process*. Michigan Virtual University. Retrieved January 22, 2021, from https://michiganvirtual.org/research/publications/guide-for-online-course-review-process/

66 See https://michiganvirtual.org/resources/sos/ to access these various *Strategies for Online Success*. Note that this orientation was originally the Online Learning Orientation Tool, which you can read more about at https://michiganvirtual.org/blog/the-online-learning-orientation-tool-olot-prepares-students-for-new-learning-experiences/

67 Access to descriptions (and in some cases recordings) of the MVLRI webinars are available at https://michiganvirtual.org/webinars/

Access to the catalogue of professional learning courses is available at https://michiganvirtual.org/courses/professional/

68 Access the *Learning Continuity Resources* website at https://michiganvirtual.org/learning-continuity/ and the *Professional Development on Remote & Blended Teaching* resource at https://michiganvirtual.org/remote-teaching/

Additionally:

DeBruler, K., & Green, C. (2020). *Learning continuity in Michigan: Plans and perceptions from spring 2020 emergency remote instruction*. Michigan Virtual University. Retrieved January 22, 2021, from https://michiganvirtual.org/research/publications/learning-continuity-in-michigan-plans-and-perceptions-from-spring-2020-emergency-remote-instruction

Michigan Virtual University. (2020). *Learning continuity: Planning considerations for school leaders*. Retrieved January 22, 2021, from https://michiganvirtual.org/research/publications/learning-continuity-planning-considerations-for-school-leaders/

Michigan Virtual University, & Sundberg-Ferar. (2020). *Michigan voices: An in-depth look at the experiences of educators, students, & parents during emergency remote learning*. Retrieved January 22, 2021, from https://michiganvirtual.org/research/michigan-voices/

69 The ten thematic reports can be found at:

DeBruler, K., & Green, C. (2020). *MVLRI research in review: Michigan K-12 online learning demographics and effectiveness*. Michigan Virtual University. Retrieved January 22, 2021, from https://michiganvirtual.org/research/publications/mvlri-research-in-review-michigan-k-12-online-learning-demographics-and-effectiveness/

DeBruler, K., & Green, C. (2020). *MVLRI research in review: K-12 online program evaluation, quality, and policy*. Michigan Virtual University. Retrieved January 22, 2021, from https://michiganvirtual.org/research/publications/mvlri-research-in-review-k-12-online-program-evaluation-quality-and-policy/

DeBruler, K., & Green, C. (2020). *MVLRI research in review: K-12 online best practices*. Michigan Virtual

University. Retrieved January 22, 2021, from https://michiganvirtual.org/research/publications/mvlri-research-in-review-k-12-online-best-practices/

DeBruler, K., & Green, C. (2020). *MVLRI research in review: K-12 on-site mentoring*. Michigan Virtual University. Retrieved January 22, 2021, from https://michiganvirtual.org/research/publications/mvlri-research-in-review-k-12-on-site-mentoring/

DeBruler, K., & Green, C. (2020). *MVLRI research in review: K-12 online learner motivation*. Michigan Virtual University. Retrieved January 22, 2021, from https://michiganvirtual.org/research/publications/mvlri-research-in-review-k-12-online-learner-motivation/

DeBruler, K., & Green, C. (2020). *MVLRI research in review: K-12 online special learner populations*. Michigan Virtual University. Retrieved January 22, 2021, from https://michiganvirtual.org/research/publications/mvlri-research-in-review-k-12-online-special-learner-populations/

DeBruler, K., & Green, C. (2020). *MVLRI research in review: K-12 online teacher preparation and professional development*. Michigan Virtual University. Retrieved January 22, 2021, from https://michiganvirtual.org/research/publications/mvlri-research-in-review-k-12-online-teacher-preparation-and-professional-development/

DeBruler, K., & Green, C. (2020). *MVLRI research in review: Online learning in higher education*. Michigan Virtual University. Retrieved January 22, 2021, from https://michiganvirtual.org/research/publications/mvlri-research-in-review-online-learning-in-higher-education/

DeBruler, K., & Green, C. (2020). *MVLRI research in review: K-12 blended learning*. Michigan Virtual University. Retrieved January 22, 2021, from https://michiganvirtual.org/research/publications/mvlri-research-in-review-k-12-blended-learning/

DeBruler, K., & Green, C. (2020). *MVLRI research in review: K-12 blended teaching and professional development*. Michigan Virtual University. Retrieved January 22, 2021, from https://michiganvirtual.org/research/publications/mvlri-research-in-review-k-12-blended-teaching-and-professional-development/

70   Rice, K.L. (2006). A comprehensive look at distance education in the K-12 context (p. 440). *Journal of Research on Technology in Education, 38*(4), 425–449.

71   Barbour, M.K., & Reeves, T.C. (2009). The reality of virtual schools: A review of the literature (p. 403). *Computers and Education, 52*(2), 402–416.

72   Cavanaugh, C., Barbour, M.K., & Clark, T. (2009). Research and practice in K-12 online learning: A review of literature. *International Review of Research in Open and Distance Learning, 10*(1). Retrieved February 17, 2020, from http://www.irrodl.org/index.php/irrodl/article/view/607

73   Borup, J., Stevens, M.A., & Waters, L.H. (2015). Parent and student perceptions of parent engagement at a cyber charter high school. *Online Learning, 19*(5), 69-91.

74   See, for example:

Arnesen, K.T., Hveem, J., Short, C.R., West, R., & Barbour, M.K. (2019). K-12 online learning journal articles: Trends from two decades of scholarship. *Distance Education, 40*(1), 32-53.

Barbour, M.K. (2018). *Lessons for K-12 distance, online and blended learning from research in higher education*. Michigan Virtual Learning Research Institute. Retrieved January 19, 2021, from https://michiganvirtual.org/research/publications/examining-online-research-in-higher-education-what-can-we-replicate-in-k-12/

Barbour, M.K. (2020). Misbehaving toddler or moody teenager: Examining the maturity of the field of K-12 online learning. *Revista de Educación a Distancia, 20*(64). Retrieved January 6, 2021, from https://revistas.um.es/red/article/view/412821/286721

Graham, C.R., Borup, J., Pulham, E., & Larsen, R. (2019). K–12 blended teaching readiness: Model and instrument development. *Journal of Research on Technology in Education, 51*(3), 239–258.

Molnar, A. (Ed.); Miron, G., Elgeberi, N., Barbour, M.K., Huerta, L., Shafer, S.R., & Rice, J.K. (2019). *Virtual schools in the U.S. 2019.* National Education Policy Center. Retrieved January 5, 2021, from http://nepc.colorado.edu/publication/virtual-schools-annual-2019

Pourreau, L., Lokey-Vega, A., & Jorrín Abellán, I.M. (2018). Why theoretical perspectives need to frame K-12 online learning. In E. Langran & J. Borup (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference* (pp. 701-710). Association for the Advancement of Computing in Education. Retrieved April 12, 2021, from https://www.learntechlib.org/primary/p/182598/

75 Saba, F. (2013). Building the future: A theoretical perspective. In M.G. Moore (Ed.), *Handbook of distance education* (3rd ed.) (pp. 49-65). Routledge.

76 Barbour, M.K. (2018). A history of K-12 online learning worldwide (p. 23). In K. Kennedy & R.E. Ferdig (Eds.), *Handbook of Research on K-12 Online and Blended Learning* (2nd ed.) (pp. 21-40). Educational Technology Center Press. Retrieved April 15, 2021, from https://figshare.com/articles/Handbook_of_Research_on_K-12_Online_and_Blended_Learning_Second_Edition_/6686813

77 Barbour, M.K. (2013). The landscape of K-12 online learning: Examining what is known. In M.G. Moore (Ed.), *Handbook of distance education* (3rd ed.) (pp. 574-593). Routledge.

78 International Association for K-12 Online Learning. (2011). *The online learning definitions project* (p. 7). Retrieved February 23, 2019, from http://www.aurora-institute.org/wp-content/uploads/iNACOL_DefinitionsProject.pdf

79 Barbour, M.K., LaBonte, R., Kelly, K., Hodges, C., Moore, S., Lockee, B., Trust, T., Bond, A., & Hill, P. (2020). *Understanding pandemic pedagogy: Differences between emergency remote, remote, and online teaching* (p. 6). Canadian eLearning Network. Retrieved January 6, 2021, from https://k12sotn.ca/wp-content/uploads/2020/12/understanding-pandemic-pedagogy.pdf

Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020). The difference between emergency remote teaching and online learning. *EDUCAUSE Review, 3.* Retrieved January 6, 2021, from https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning

80 Loeb, S., & Hill, H. (2020-2021). Weighing the research: What works, what doesn't. *Education Week.* Retrieved January 6, 2021, from https://www.edweek.org/leadership/weighing-the-research-what-works-what-doesnt

81 The examples were:

Ahn, J., & McEachin, A. (2017). Student enrollment patterns and achievement in Ohio's online charter schools. *Educational Researcher, 46*(1), 44-57. Retrieved January 6, 2021, from https://journals.sagepub.com/doi/pdf/10.3102/0013189X17692999

Hart, C.M., Berger, D., Jacob, B., Loeb, S., & Hill, M. (2019). Online learning, offline outcomes: Online course taking and high school student performance. *AERA Open, 5*(1), 1-17. Retrieved January 6, 2021, from https://journals.sagepub.com/doi/pdf/10.1177/2332858419832852

Heppen, J.B., Sorensen, N., Allensworth, E., Walters, K., Rickles, J., Taylor, S.S., & Michelman, V. (2017). The struggle to pass algebra: Online vs. face-to-face credit recovery for at-risk urban students. *Journal of Research on Educational Effectiveness, 10*(2), 272-296.

82 Hrastinski, S. (2019). What do we mean by blended learning? *TechTrends, 63*(5), 564-569.

83 International Association for K-12 Online Learning. (2011). *The online learning definitions project.* (p. 3).

Retrieved January 6, 2021, from http://www.aurora-institute.org/wp-content/uploads/iNACOL_Definitions Project.pdf

84 Halverson, L.R., & Graham, C.R. (2019). Learner engagement in blended learning environments: A conceptual framework (p. 146). *Online Learning, 23*(2), 145-178. Retrieved January 21, 2021, from https://olj.online-learningconsortium.org/index.php/olj/article/view/1481

85 Staker, H., & Horn, M.B. (2012). *Classifying K–12 blended learning*. Innosight Institute. Retrieved January 6, 2021, from http://www.christenseninstitute.org/wp-content/uploads/2013/04/Classifying-K-12-blended-learning.pdf

86 For example, this is one of the models suggested by:

California Department of Education. (2020). *Stronger together: A guidebook for the safe reopening of California's public schools*. Retrieved January 6, 2021, from https://www.cde.ca.gov/ls/he/hn/documents/strongertogether.pdf

87 Irvine, V. (2020). The landscape of merging modalities. *EDUCAUSE Review, 10*. Retrieved January 7, 2021, from https://er.educause.edu/articles/2020/10/the-landscape-of-merging-modalities

88 Martin, F., Polly, D., & Ritzhaupt, A. (2020). Bichronous online learning: Blending asynchronous and synchronous online learning. *EDUCAUSE Review, 9*. Retrieved January 7, 2021, from https://er.educause.edu/articles/2020/10/the-landscape-of-merging-modalities

89 Irvine, V. (2020). The landscape of merging modalities. *EDUCAUSE Review, 10*. Retrieved January 7, 2021, from https://er.educause.edu/articles/2020/10/the-landscape-of-merging-modalities

90 Ferdig, R.E., & Kennedy, K. (Eds). (2014). *Handbook of research on K-12 online and blended learning* (1st ed.) (page vii). Entertainment Technology Center Press, Carnegie Mellon University. Retrieved January 8, 2021, from https://figshare.com/articles/Handbook_of_Research_on_K-12_Online_and_Blended_Learning/6686810

91 McCracken, H. (2020, July 21). Before Zoom and Coronavirus, how the telephone became the 20th century's most successful remote-learning technology for homebound students. *The 74*. Retrieved January 4, 2021, from https://www.the74million.org/article/how-the-telephone-became-the-20th-centurys-most-successful-remote-learning-technology-for-homebound-students/

92 Stern, A.M., Cetron, M.S., & Markel, H. (2009). Closing the schools: Lessons from the 1918–19 US influenza pandemic: Ninety-one years later, the evidence shows that there are positive and negative ways to do it (p. w1075). *Health Affairs, 28*(Suppl1), w1066-w1078. Retrieved January 21, 2021, from https://www.healthaffairs.org/doi/pdf/10.1377/hlthaff.28.6.w1066?casa_token=Y71h0KRuld8AAAAA:poldDOTiMjoWFlew5Xos-a0GHzDY49d7BCyykT-xQ_Uei7fJzhO7caWL3XnCQDhZoOLnwH_okkr7y

93 Kohli, S., & Blume, H. (2020, March 12). L.A. Unified plans for teaching by television after canceling all large gatherings. *Los Angeles Times*. Retrieved January 11, 2020, from https://www.latimes.com/california/story/2020-03-11/lausd-events-cancelled-coronavirus

94 Barbour, M.K. (2018). *Examining online research in higher education: What can we replicate in K-12?* Michigan Virtual University. Retrieved February 23, 2019, from https://mvlri.org/research/publications/examining-online-research-in-highereducation-what-can-we-replicate-in-k-12/

References/citations related to the Educational Success Prediction Instrument include:

Roblyer, M.D. (2005). Who plays well in the virtual sandbox? Characteristics of successful online students and teachers. *SIGTel Bulletin*, (2). Retrieved February 23, 2019, from http://web.archive.org/web/20060930130650/http://www.iste.org/Content/NavigationMenu/Membership/SIGs/SIGTel_Telelearning_/SIGTel_Bulletin2/Archive/2005_20067/2005_July_-_Roblyer.htm

Roblyer, M.D. (2006). Virtually successful: Defeating the dropout problem through online school programs. *Phi Delta Kappan. 88*(1), 31-36.

Roblyer, M.D., Davis, L., Mills, S.C., Marshall, J., & Pape, L. (2008) Toward practical procedures for predicting and promoting success in virtual school students. *American Journal of Distance Education, 22*(2), 90–109.

Roblyer, M.D., & Marshall, J.C. (2002-2003). Predicting success of virtual high school students: Preliminary results from an educational success prediction instrument. *Journal of Research on Technology in Education, 35*(2), 241-255.

References/citations related to the Parental Involvement Mechanisms Model include:

Liu, F., Black, E., Algina, J., Cavanaugh, C., & Dawson, K. (2010). The validation of one parental involvement measurement in virtual schooling. *Journal of Interactive Online Learning*, *9*(2). Retrieved February 23, 2019, from http://www.ncolr.org/jiol/issues/pdf/9.2.2.pdf

References/citations related to the K-12 Blended Teaching Readiness instrument:

Graham, C.R., Borup, J., Pulham, E., & Larsen, R. (2017). *K-12 blended teaching readiness: Phase 1 – Instrument development*. Michigan Virtual University. Retrieved February 23, 2019, from https://mvlri.org/research/publications/k-12-blended-teaching-readiness-instrument-development/

Graham, C.R., Borup, J., Pulham, E., & Larsen, R. (2018). *K-12 blended teaching readiness: Phase 2 – Instrument development*. Michigan Virtual University. Retrieved February 23, 2019, from https://mvlri.org/research/publications/blended-teaching-readiness-phase-2-instrument-development/

Graham, C.R., Borup, J., Pulham, E., & Larsen, R. (2019). K–12 blended teaching readiness: Model and instrument development. *Journal of Research on Technology in Education, 51*(3), 239-258.

Graham, C.R., Borup, J., Short, C., & Archambault, L. (2018). *Blended teaching and personalized learning: A practical guide for K-12 teachers*. Pressbooks. Retrieved February 23, 2019 from https://k12blendedteaching.pressbooks.com/

Pulham, E., & Graham, C.R. (2018). Comparing K-12 online and blended teaching competencies: A literature review. *Distance Education*, *39*(3), 411-432.

95   Lokey-Vega, A., Jorrín-Abellán, I.M., & Pourreau, L. (2018). Theoretical perspectives in K-12 online learning. In K. Kennedy & R.E. Ferdig (Eds.), *Handbook of research on K-12 online and blended learning (2nd ed.)* (pp. 65-90). Entertainment Technology Center Press, Carnegie Mellon University. Retrieved February 23, 2019, from https://figshare.com/articles/Handbook_of_Research_on_K-12_Online_and_Blended_Learning_Second_Edition_/6686813

96   McDonald, J.K., & Yanchar, S.C. (2020). Towards a view of originary theory in instructional design. *Educational Technology Research and Development, 68*, 633–651.

97   Graham, C.R., Henrie, C.R., & Gibbons, A.S. (2013). Developing models and theory for blended learning research (p. 13). In A. G. Picciano, C.D. Dziuban, & C.R. Graham (Eds.), *Blended Learning: Research Perspectives Volume 2* (pp. 13-33), Routledge.

98   Whetten, D.A. (1989). What constitutes a theoretical contribution? (p. 491). *The Academy of Management Review, 14*(4), 490–495.

99   McDonald, J.K., & Yanchar, S.C. (2020). Towards a view of originary theory in instructional design (p. 646). *Educational Technology Research and Development, 68*, 633–651.

100 Borup, J. (2016). Teacher perceptions of parental engagement at a cyber high school. *Journal of Research on Technology in Education, 48*(2), 67-83.

Borup, J. (2016). Teacher perceptions of peer engagement at an online high school. *International Review of Research in Open and Distance Learning, 17*(3), 231-250. Retrieved January 13, 2020, from http://www.irrodl.org/index.php/irrodl/article/view/2361

Borup, J., Chambers, C., & Stimson, R. (2019). Online teacher and on-site facilitator perceptions of parental engagement at a supplemental virtual high school. *International Review of Research in Open and Distributed Learning, 20*(2). Retrieved January 13, 2020, from http://www.irrodl.org/index.php/irrodl/article/view/4237

Borup, J., Chambers, C., & Stimson, R. (2019). K-12 student perceptions of online teacher and on-site facilitator support in supplemental online courses. *Online Learning, 23*(4), 253-280. Retrieved January 13, 2020, from https://olj.onlinelearningconsortium.org/index.php/olj/article/view/1565/874

Borup, J., Graham, C.R., & Drysdale, J. (2014). The nature of online teacher engagement an online high school. *British Journal of Educational Technology, 45*, 793-806.

Borup, J., Graham, C.R., West, R.E., Archambault, L., & Spring, K.J. (2020). Academic communities of engagement: an expansive lens for examining support structures in blended and online learning. *Educational Technology Research and Development, 68*(2), 807-832.

Borup, J., Jensen, M., Archambault, L., Short, C.R., & Graham, C.. (2020). Supporting students during COVID-19: Developing and leveraging academic communities of engagement in a time of crisis. *Journal of Technology and Teacher Education, 28*(2), 161-169.

Borup, J. & Stimson, R. (2019). Online teachers' and on-site facilitators' shared responsibilities at a supplemental virtual secondary school. *American Journal of Distance Education, 33*(1), 29-45.

Borup, J. & Stevens, M. (2016). Parents' perceptions of teacher support at a cyber charter high school. *Journal of Online Learning Research, 2*(1), 3-22. Retrieved April 15, 2021, from https://www.editlib.org/p/171462

Borup, J., & Stevens, M.A. (2017). Using student voice to examine teacher practices at a cyber charter high school. *British Journal of Educational Technology, 48*(5), 1119-1130.

Borup, J., Stevens, M., & Hasler Waters, L. (2015). Student and parent perceptions of parental engagement at an online charter high school. *Online Learning, 19*(5). Retrieved April 15, 2021, from http://olj.onlinelearningconsortium.org/index.php/olj/article/download/699/182

Borup, J., Walters, S., & Call-Cummings, M. (2019). Examining the complexities of parental engagement at an online charter high school: A narrative analysis approach. *International Review of Research in Open and Distributed Learning, 20*(1). Retrieved January 13, 2020, from http://www.irrodl.org/index.php/irrodl/article/view/3605

Borup, J., West, R.E., Graham, C.R., & Davies, R.S. (2014). The adolescent community of engagement: A framework for research on adolescent online learning. *Journal of Technology and Teacher Education, 22*(1), 107-129.

Oviatt, D., Graham, C.R., Borup, J., & Davies, R.S. (2016). Online student perceptions of the need for a proximate community of engagement at an independent study program. *Journal of Online Learning Research, 2*(4), 333-365. Retrieved January 13, 2020, from http://www.learntechlib.org/p/173649

Oviatt, D.R., Graham, C.R., Davies, R.S., & Borup, J. (2018). Online student use of a proximate community of engagement in an independent study program. *Online Learning, 22*(1), 223-251. Retrieved January 13, 2020, from https://olj.onlinelearningconsortium.org/index.php/olj/article/view/1153

101 Mathewson, T.G., & Butrymowicz, S. (2020, May 20). Ed tech companies promise results, but their claims are often based on shoddy research. *The Hechinger Report*. Retrieved January 21, 2021, from https://hechingerreport.org/ed-tech-companies-promise-results-but-their-claims-are-often-based-on-shoddy-research/

102 Molnar, A., Boninger, F., & Fogarty, J. (2011). *The educational cost of schoolhouse commercialism: The fourteenth annual report on schoolhouse commercializing trends: 2010-2011.* National Education Policy Center. Retrieved January 21, 2021, from http://nepc.colorado.edu/publication/schoolhouse-commercialism-2011

103 Aspegren, E. (2020, September 3). 'Inappropriate and racist content': Some schools cancel online curriculum Acellus as COVID-19 back to school kicks off. *USA Today.* Retrieved January 21, 2021, from https://www.usatoday.com/story/news/education/2020/09/03/covid-online-school-acellus-virtual-learning/3447522001/

104 Tate, E. (2020, September 10). Schools drop Acellus learning platform over 'glaring' offensive content. *EdSurge.* Retrieved January 21, 2021, from https://www.edsurge.com/news/2020-09-10-schools-drop-acellus-learning-platform-over-glaring-offensive-content

105 Koh, Y. (2020, September 22). 'G is for gun': Online curriculum outrages parents. *The Wall Street Journal.* Retrieved January 21, 2021, from https://www.wsj.com/articles/schools-drop-an-online-curriculum-after-teacher-parent-complaints-11600804539

Lee, S. (2020, November 9). DOE report: Acellus online curriculum violated religion, discrimination policies. *Honolulu Civil Beat.* Retrieved January 21, 2021, from https://www.civilbeat.org/2020/11/doe-report-acellus-online-curriculum-violated-religion-discrimination-policies/

106 Herold, B. (2020, August 31). Complaints over offensive content lead schools to drop online learning provider. *Education Week.* Retrieved January 21, 2021, from https://www.edweek.org/technology/complaints-over-offensive-content-lead-schools-to-drop-online-learning-provider/2020/08

Taketa, K. (2020, September 14). One San Diego school district drops an online program over offensive content; another sticks with it. *The San Diego Union-Tribune.* Retrieved January 21, 2021, from https://www.sandiegouniontribune.com/news/education/story/2020-09-14/one-san-diego-district-drops-online-program-over-offensive-content-another-sticks-with-it

107 Saba, F. (2003). Distance education theory, methodology, and epistemology: A pragmatic paradigm. In M.G. Moore (Ed.), *Handbook of distance education* (1st ed.) (pp. 3-20). Lawrence Erlbaum Associates, Publishers.

Saba, F. (2007). A systems approach in theory building. In M.G. Moore (Ed.), *Handbook of distance education* (2nd ed.) (pp. 43-55). Lawrence Erlbaum Associates, Publishers.

Saba, F. (2013). Building the future: A theoretical perspective. In M.G. Moore (Ed.), *Handbook of distance education* (3rd ed.) (pp. 49-65). Routledge.

108 Refer to the "Our Work" section of the International Association for K-12 Online Learning website at https://www.inacol.org/our-work/

Patrick, S., Kennedy, K., & Powell, A. (2013). *Mean what you say: Defining and integrating personalized, blended and competency education.* International Association for K-12 Online Learning. Retrieved February 23, 2019, from https://www.inacol.org/wp-content/uploads/2015/02/mean-what-you-say-1.pdf

Sturgis, C., & Patrick, S. (2011). *It's not a matter of time: Highlights from the 2011 Competency-Based Learning Summit.* International Association for K-12 Online Learning. Retrieved February 23, 2019, from https://www.inacol.org/wp-content/uploads/2015/02/iNACOL_Its_Not_A_Matter_of_Time_full_report.pdf

109 Borup, J., Graham, C.R., West, R.E., Archambault, L., & Spring, K.J. (2020). Academic communities of engagement: An expansive lens for examining support structures in blended and online learning. *Educational Technology Research and Development, 68*(2), 807-832.

110 Kennedy, K., & Archambault, L. (2012). Offering preservice teachers field experiences in K-12 online learning: A national survey of teacher education programs. *Journal of Teacher Education, 63*(3), 185-200.

111 Archambault, L., Kennedy, K., Shelton, C., Dalal, M., McAllister, L., & Huyett, S. (2016). Incremental progress: Re-examining field experiences in K-12 online learning contexts in the United States. *Journal of Online*

Learning Research, 2(3), 303-326. Retrieved January 21, 2021, from https://www.learntechlib.org/primary/p/174116/

112 Gronseth, S., Brush, T., Ottenbreit-Leftwich, A., Strycker, J., Abaci, S., Easterling, W., Roman, T., Shin, S., & Leusen, P.V. (2010). Equipping the next generation of teachers: Technology preparation and practice. *Journal of Digital Learning in Teacher Education, 27*(1), 30–36

113 Office of Educational Technology. (2016). *Advancing educational technology in teacher preparation: Policy brief*. U.S. Department of Education. Retrieved January 21, 2021, from https://tech.ed.gov/files/2016/12/Ed-Tech-in-Teacher-Preparation-Brief.pdf

114 Ferdig, R.E., Baumgartner, E., Hartshorne, R., Kaplan-Rakowski, R. & Mouza, C. (2020). *Teaching, technology, and teacher education during the COVID-19 pandemic: Stories from the field.* Association for the Advancement of Computing in Education. Retrieved January 22, 2021, from https://www.learntechlib.org/p/216903/

Hartshorne, R., Baumgartner, E., Kaplan-Rakowski, R., Mouza, C., & Ferdig, R.E. (2020). Special issue editorial: Preservice and inservice professional development during the COVID-19 pandemic. *Journal of Technology and Teacher Education, 28*(2), 137-147. Retrieved January 22, 2021, from https://www.learntechlib.org/primary/p/216910/

115 Barbour, M.K. (2018). A history of K-12 online learning worldwide (p. 23). In K. Kennedy & R.E. Ferdig (Eds.), *Handbook of Research on K-12 Online and Blended Learning* (2nd ed., pp. 21-40). Educational Technology Center Press. Retrieved April 15, 2021, from https://figshare.com/articles/Handbook_of_Research_on_K-12_Online_and_Blended_Learning_Second_Edition_/6686813

116 Hu, M., Arnesen, K., Barbour, M.K., & Leary, H. (2019). A newcomer's lens: A look at K-12 online and blended learning in the *Journal of Online Learning Research* (p. 132). *Journal of Online Learning Research, 5*(2), 123-144. Retrieved January 19, 2021, from https://www.learntechlib.org/primary/p/195231/

117 Borup, J., & Archambault, L. (2019). A time for reflection: Recognizing successes and planning for improvements (p. 120). *Journal of Online Learning Research, 5*(2), 119-122. Retrieved April 15, 2021, from https://www.learntechlib.org/primary/p/210449/

118 Seok, S., & DaCosta, B. (2020). Relationships between young South Koreans' online activities and their risk of exploitation. *Journal of Online Learning Research, 6*(1), 77-101. Retrieved January 19, 2021, from https://www.learntechlib.org/primary/p/210321/

119 Arnesen, K., Walters, S., Barbour, M.K., & Borup, J. (2020). Irrelevant, overlooked, or lost? Trends in 20 years of uncited and low cited K-12 online learning articles. *Online Learning, 24*(2), 187-206. Retrieved January 19, 2021, from https://olj.onlinelearningconsortium.org/index.php/olj/article/view/2080

120 Barbour, M.K. (2011). The promise and the reality: Exploring virtual schooling in rural jurisdictions. *Education in Rural Australia, 21*(1), 1-20.

121 Knudson, A. (2020, March 20). How prepared are teachers, parents for remote learning? *Staten Island Live*. Retrieved January 4, 2021, from https://www.silive.com/coronavirus/2020/03/how-prepared-are-teachers-parents-for-remote-learning.html

Kast, M. (2020, April 19). 'We just weren't prepared': Knox County Schools superintendent on coronavirus shutdown. *Knoxville News Sentinel.* Retrieved January 4, 2021, from https://www.knoxnews.com/story/news/education/2020/04/19/knox-county-superintendent-bob-thomas-coronavirus-crisis/5149386002/

Strauss, V. (2020, April 2). New York's Andrew Cuomo asked why the country wasn't ready for a mass shift to online education. Here's why. *The Washington Post*. Retrieved January 11, 2020, from https://www.washingtonpost.com/education/2020/04/02/new-yorks-andrew-cuomo-asked-why-country-wasnt-ready-mass-shift-online-education-heres-why/

122 Tate, E. (2020, December 10). As districts return to remote learning, are they any better prepared? *EdSurge*. Retrieved January 4, 2021, from https://www.edsurge.com/news/2020-12-10-as-districts-return-to-remote-learning-are-they-any-better-prepared

123 Haugen, J.M. (2015). Flexible learning days. *The Education Digest, 81*(1), 48-51.

Hua, D.M., Davison, C.B., & Kaja, S. (2017). Stakeholder response to virtual learning days in public school districts. *CTE Journal, 5*(1), 20-33. Retrieved January 4, 2021, from http://www.thectejournal.com/up-loads/1/0/6/8/10686931/hua.pdf

Milman, N.B. (2014). Snow days: Is distance education a solution in K-12 schools? *Distance Learning, 11*(2), 45-48.

Morones, A. (2014). Snow days turn into e-learning days for some schools. *Education Week, 33*(20), 6-7. Retrieved January 4, 2021, from http://www.edweek.org/ew/articles/2014/01/31/20snow.h33.html

Swetlik, Z., Graves, T., Hua, D.M., & Davison, C.B. (2015). Virtual learning strategies for lost instructional time. *The CTE Journal, 3*(2), 15-27. Retrieved January 4, 2021, from https://www.thectejournal.com/up-loads/1/0/6/8/10686931/swetlik.pdf

124 Barbour, M. (2010). Perspectives on e-learning: Development and challenges of K-12 online learning (p. 310). In D. Gibson & B. Dodge (Eds.), *Proceedings of SITE 2010 – Society for Information Technology & Teacher Education International Conference* (pp. 310-315). Association for the Advancement of Computing in Education (AACE). Retrieved January 4, 2021, from https://www.learntechlib.org/primary/p/33355/

125 Barbour, M.K., Brown, R., Hasler Waters, L., Hoey, R., Hunt, J., Kennedy, K., Ounsworth, C., Powell, A., & Trimm, T. (2011). *Online and blended learning: A survey of policy and practice from K-12 schools around the world*. International Association for K-12 Online Learning. Retrieved January 4, 2021, from https://aurora-institute.org/resource/online-and-blended-learning-a-survey-of-policy-and-practice-from-k-12-schools-around-the-world/

126 Alpert (2011). Online education in Hong Kong. In M.K. Barbour, L. Hasler Waters, & J. Hunt (Eds.), *Online and blended learning: Case studies from K-12 schools around the world* (pp. 37-59). International Association for K-12 Online Learning.

127 Latchem, C., & Jung, I. (2009). *Distance and blended learning in Asia*. Routledge.

128 Mackey, J., Gilmore, F., Dabner, N., Breeze, D., & Buckley, P. (2012). Blended learning for academic resilience in times of disaster or crisis (p. 122). *Journal of Online Learning and Teaching, 8*(2), 122-135. Retrieved January 4, 2021, from https://jolt.merlot.org/vol8no2/mackey_0612.pdf