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Exploring the impact of COVID-19 on the grammar of schools in project-based learning contexts

Peter J. Woods[1] · **Emma Anderson**[2] · **Avneet Hira**[3]

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Abstract
While scholars and public figures have positioned the COVID-19 pandemic as an opportunity for school reform, the response to this potential for change by teachers remains underexplored. In turn, we attend to the following research question: how do teachers at project-based learning high schools conceptualize the changes to education that have occurred in response to the COVID-19 pandemic? In analyzing temporally dispersed interviews with eight teachers from four different schools in the United States between 2020 and 2022, we found that participants recognized changes in the pedagogies, curricula, assessments, and structures in their school systems. In particular, teachers conceptualized these educational shifts through the lenses of technological change, a push for student-centered practices, and an embrace of real world applications of learning. However, they also described a reversal of these changes once in person schooling returned, illustrating an inability of the pandemic to affect the "grammar of schools" (Tyack & Tobin, 1994).

Keywords Grammar of schools · School reform · COVID-19 · Project-based learning · Emergency remote teaching

Amidst the ongoing COVID-19 pandemic, public figures and academic scholars have enacted and contributed to a growing discourse on the current state of formal schooling. For some, this moment presents an opportunity to reimagine or "reset"

✉ Peter J. Woods
peter.woods@nottingham.ac.uk

Emma Anderson
eanderso@mit.edu

Avneet Hira
avneet.hira@bc.edu

[1] University of Nottingham, 7301 Wollaton Rd, Lenton, Nottingham NG8 1BB, UK

[2] Massachusetts Institute of Technology, 700 Technology Square, Cambridge, MA 02139, USA

[3] Boston College, 245 Beacon St, Chestnut Hill, MA 02467, USA

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K-12 schooling to align what students learn with the demands of modern society (Grob-Zakhary, 2020; Pierce, 2020). Others have positioned the disruption to education caused by the pandemic as a means towards challenging the old faults of schooling by equitably engaging students in critical thinking and relevant knowledge construction (Christakis, 2020; Morales-Doyle et al., 2020). This framing of the disruption caused by COVID-19 therefore conceptualizes the educational reset as a way to enact a new or imagined future, one that sheds the lingering problematics of K-12 education to reconceptualize the very foundation of schooling itself. Despite important differences between these stances, both sides agree that school reform should occur, and COVID-19 may in some ways have initiated that change. What that change should entail, however, remains up for debate.

While this discussion of the future of schooling represents a generative framing of school change within reform discourse that could build on the disruptive momentum generated by the COVID-19 pandemic, participants often overlook a crucial viewpoint in this conversation: the perspective of teachers. As Pokhrel and Chhetri (2021) show, scholars have regularly examined the impact COVID-19 has had on teachers without examining how teachers themselves conceptualize, embrace, or reject the changes to schools resulting from the pandemic. But understanding this perspective proves crucial because teachers significantly impact the success or failure of school reform efforts, shaping these processes through their own agency (Datnow, 2012). Understanding the educational reset brought on by COVID-19, and whether or not it occurred at all, therefore must involve an investigation of how teachers themselves experience and theorize this moment.

In response to this contention, we address the following research question: how do teachers at project-based learning (PBL) high schools conceptualize the changes to education that have occurred in response to the COVID-19 pandemic? To do so, we approach this work through the lens of "the grammar of schooling." In their original formation of the term, Tyack and Tobin (1994) define the grammar of schooling as "the regular structures and rules that organize the work of instruction" (p. 454). Research has shown that the grammar of schooling represents both a barrier to and a site of change for school reform efforts (Hargreaves & Goodson, 2006; Mehta & Datnow, 2020), providing a valuable lens for ongoing investigations into school change that scholars have applied within multiple international contexts (Baena et al., 2022; Daniels-Mayes, 2017; Lefstein, 2009). We take up this work by analyzing longitudinal interviews with eight US-based teachers who taught in PBL schools through the first two years of the pandemic. PBL, in this instance, refers to an instructional approach where students learn by working in open-ended, "real-world" contexts through independent research and the creation of new artifacts that represent a tangible solution or answer to initial queries. We focus on schools that employ a PBL approach because of their existing propensity for school change (Odell et al., 2019) and inherent challenge to the grammar of schooling (Fitzgerald, 2020). As Ravitz (2010) argues, the successful use of PBL within schools both necessitates and furthers efforts to implement instructional, structural, and cultural changes within K-12 settings, all of which amounts to a shift away from the grammar of schools at multiple levels. To this end, PBL schools represent a fruitful site of research in understanding

school change amid the COVID-19 pandemic because stakeholders in the school are already actively working towards reform.

Through our analysis, we show that teachers responded to the shifting educational landscape of the COVID-19 pandemic by making changes to the pedagogies, curricula, assessments, and structures within their classrooms and schools. These changes range from necessary but unwanted compromises to embodied school reform processes and largely existed within three distinct categories: shifts in technology use, push for more student-centric practices, and an embrace of real-world experiences within the classroom. The collection of reform-minded changes nominated by the teachers align with PBL as an instructional model and tool for educational change. They also indicated that the shift in schools generated by COVID-19 created the flexibility necessary to fully embrace, amplify, and enact these changes. However, teachers also described a need to "return to normal" as the pandemic wore on, with participants regularly returning to practices that have defined the grammar of schooling for centuries. This study therefore shows that the international disruption of the COVID-19 pandemic, while providing some incremental but lasting changes, did not provide the necessary force needed to systematically shift the grammar of schooling in the participants' school contexts. Although it does provide an opportunity to experiment with new approaches to education, larger changes impacting school culture remain necessary for widespread school reform to occur.

Literature review

In framing this study, we draw on three bodies of literature: theorizations of the grammar of schooling, research into project based learning, and emergent studies of the impact of the COVID-19 pandemic on K-12 schooling. Taken together, these three areas of scholarship provide an in-depth theoretical foundation to explore teachers' conceptions of the opportunity for positive educational change produced by COVID-19.

The grammar of schooling

According to Tyack and Tobin (1994), the grammar of schooling represents the set of established practices and regulations that make schooling a legible institution. Tyack and Cuban (1995) expand on this definition when they draw the following comparison: "practices such as age-graded classrooms structure schools in a manner analogous to the way grammar organizes meaning in verbal communication" (p. 86). These socially defined and often unconsciously recognized structures that define the grammar of schooling (and, by extension, the school as an institution) also include "standardized organizational practices in dividing time and space, classifying students and allocating them to classrooms, and splintering knowledge into 'subjects'" (Tyack & Tobin, 1994, p. 454). The components of this grammar exist in all corners of educational ecologies, from curricula (Lefstein, 2009) and educational technologies (Martínez Arbelaiz & Correa Gorospe, 2009) to student–teacher relationships

(Nolan, 2020) and the social forces that surround schools (Courtney & Mann, 2021). But these practices still fade into a taken-for-granted background despite their ubiquity. Only when schools attempt to move away from this grammar do stakeholders and the public at large take notice (Tyack & Cuban, 1995).

The grammar of schooling as a conceptual framework for educational research has gained traction since its inception because of its ability to explain the difficulties of school reform within international contexts. Hargreaves and Goodson (2006), for instance, argue that school change efforts that make attempts to challenge the grammar of schooling often fail, whereas reform movements with long lasting impacts largely repurpose taken for granted aspects of schooling and repackage them as new ideas. According to Courtney and Mann (2021), educational change fails to occur because the focus on shifting the practices and cultures within schools does not actually change the globalized, societal forces that reinscribe the grammar of schooling. To this end, Zhao (2020) forwards the idea that the grammar of schooling cannot change because school reform emphasizes the institution of schooling as opposed to the social praxis of education. Attempts to change how we think about and "do" school need to take a broad approach that reimagines education from the bottom up, rethinking not only what education should do but what society itself should be (Mehta, 2022).

But Cuban (2020) has also shown that schools do have the ability to change over time, making incremental changes through persistent efforts to implement progressive reforms. Broadly speaking, this kind of change occurs at the school or classroom level with educators and administrators working from the ground up through adjustments to components of traditional education such as pedagogy, curriculum, technology, and school structures. In terms of challenges to pedagogy, this involves teachers adopting pedagogical approaches that challenge students to learn more than just developing low level cognitive skills (Mehta & Datnow, 2020) and adopting new forms of student–teacher relationships (Greene Nolan, 2020). Additionally, education stakeholders have implemented curricular shifts wherein students learn within and through real-world settings or engage with other topics and materials beyond standards-based curricula (Fitzgerald, 2020; Lefstein, 2009). In terms of technology, previous research shows that the incorporation of technological advances can reinterpret interpersonal interactions and education praxes within schools by creating opportunities for educators to reimagine the building blocks of learning and schooling (Martínez Arbelaiz & Correa Gorospe, 2009). Finally, school leadership can also take on the work of challenging the grammar of schooling by shifting leadership models and other school structures, creating space for teachers and students to engage in the kind of educational work that sits outside of this grammar (Baena et al., 2022; Hubbard & Datnow, 2020; VanGronigen et al., 2023).

But, as Fullan (2020) argues, these kinds of "piecemeal, small-scale, and short-lived" changes do not truly address the persistence of the grammar of schooling in ways that translate into systemic change (p. 654). This resistance to change stems from the role of education in society, as the institution of schools extends far beyond just providing a space for students to learn and includes a whole host of social institutions that rely on the school for reinscription and reproduction (Courtney & Mann, 2021; Daniels-Mayes, 2017; Hargreaves & Goodson, 2006). But for those

still intent on challenging the grammar of schooling, this process often involves a shift towards adjusting the grammar of a specific school as opposed to removing this grammar from the institution altogether. Labaree (2021) illustrates this issue when exploring the kinds of changes that occur in school reform. According to the author, the changes that prove most effective need to align with the school's social mission and organizational needs simultaneously. If school reformers can accomplish this, then the grammar of schooling can adopt those changes. But this can only occur if reform movements have the momentum needed to overcome institutional logics, which many initiatives do not (Marsh et al., 2020). Instead, school change routinely represents "an historical process of tightening interrelations among schools across space in which space and status are increasingly intertwined" (Hargreaves & Goodson, 2006, p. 27), with schools becoming more homogenized over time.

Project-based learning

To further ground this work, we specifically focus on school change during the COVID-19 pandemic within project-based learning (PBL) schools. We do so because school reform advocates have increasingly employed PBL as a tool for school reform because of the challenge that PBL poses to traditional modes of teaching and learning that exist within the grammar of schooling (Odell et al., 2019; Ravitz, 2008, 2010; Surakarn et al., 2020). As Martínez Arbelaiz and Correa Gorospe (2009) argue, PBL as both an instructional method and school structure sits in direct opposition to the assumptions at the heart of the grammar of schooling. We therefore argue that teachers who use PBL may be more inclined to welcome challenges to the grammar of schooling caused by COVID-19, as they regularly embodied similar challengers through their implementation of this pedagogical approach before the onset of the pandemic (Fitzgerald, 2020). This framing thus positions PBL schools as a valuable site of research in examining school change efforts during the current pandemic (and otherwise).

At the pedagogical level, PBL reimagines instruction through five broad steps: asking an open-ended question or choosing a complex problem to solve; independently exploring the real-world and situated implications of those questions along with contributing factors to these problems; collaboratively developing solutions to initial problems with other students, teachers, and community members; engaging with technology and non-traditional resources to expand beyond standardized or traditional curricula; and replacing traditional assessments or classroom activities with the creation and sharing of new artifacts that respond to the students' original questions and problems (Jacques et al., 2020). As an example, teachers may rework a traditional biology unit about freshwater ecosystems by focusing on the complex problem of cleaning up a polluted local river. Students would begin this process by independently and collaboratively researching the causes of this pollution and the implications this pollution has for the local community and river ecology (thus overlapping with the biology content standards from the original unit). The class would work together to develop possible solutions to the problem, receiving feedback from teachers and other students on initial proposals and meeting with experts from local

organizations dedicated to anti-pollution initiatives. Learners then create prototypes of new tools that will aid in river clean up and presentations to argue for their proposed solutions, engaging a wide range of technologies in this process. Finally, the unit ends when students publicly share these proposals with experts, students, teachers, and community members, generating valuable feedback on their solutions that they can implement in the real-world. These proposals also replace traditional summative assessments, as they embody what students have learned throughout the process and the critical thinking they have engaged along the way.

The reimagining of assessment as an open-ended and creative process represents the most crucial aspect of PBL as a tool in school reform because it undermines the ubiquitous use of uniform testing and standardized curricula. PBL also poses a challenge to the grammar of schooling by amplifying "three constructivist principles: learning is context-specific, learners are involved actively in the learning process, and they achieve their goals through social interactions and the sharing of knowledge and understanding" (Kokotsaki et al., 2016, pp. 267–268). PBL therefore poses a direct challenge to the foundational conception of learning as a discrete and disconnected process that persists in schools (Mehta & Fine, 2019). This body of literature thus reiterates the potential of working with PBL teachers in understanding shifts in the grammar of schooling caused by COVID-19. While some teachers may push back on challenges to the grammar of schooling caused by the pandemic due to a pre-existing dedication to traditional teaching methods, PBL teachers have already shown an interest in reimagining schooling practices. This population therefore presents a powerful opportunity to examine in detail the potential for school change within this particular moment.

From the learner's perspective, the self-directed nature of both articulating open-ended driving questions and exploring possible responses to those questions positions the student at the center of learning praxes, creating an opportunity for students to enact control over their own educational experience (Dymond et al., 2015; Svihla & Reeve, 2020). In turn, PBL educators move away from their role as knowledge distributors by designing classroom structures, learning experiences, and support practices that can scaffold the independent processes of PBL for students and ensure their success (Barron et al., 1998). Shifting one's teaching practice in this way requires teachers to embrace new attitudes, develop new pedagogical models, and construct new teaching knowledge (Dole et al., 2016). Even though PBL has often been positioned as a means towards school reform, this pedagogical approach still holds value within traditional models of schooling. Studies implemented across global contexts have repeatedly shown that students who learn via PBL score just as well, if not better, on standardized tests in a variety of subjects when compared to those who learn through more traditional approaches (Duke et al., 2021; Krajcik et al., 2023; Remijan, 2017). Teacher education research has also linked PBL to an increased sense of self-efficacy, professional identity, and personal understandings of students as individuals (Havice et al., 2018; Potvin et al., 2021; Tsybulsky & Muchnik-Rozanov, 2019). All told, PBL represents a powerful form of pedagogy within schools that challenges traditional modes of teaching and learning.

Of particular importance to this study, researchers have regularly positioned PBL as a tool for school reform initiatives. As Ravitz (2008, 2010) argues, PBL and

progressive education reform efforts are mutually beneficial because of PBL's ability to shift school cultures towards individualized and personalized learning, professional engagement, teacher-centric leadership, and community-oriented learning. Cervantes et al. (2015) also argue that the improvement in learning metrics caused by engaging in PBL provide evidence for PBL's use in school reform efforts. In terms of challenging the grammar of schooling, Fitzgerald (2020) recognizes PBL's ability to amplify the development of socio-emotional skills alongside disciplinary learning, thus further shifting schools away from traditional curricula in potentially unexpected ways. However, the employment of PBL as a tool for progressive school reform still encounters the same issues that stakeholders often face in these efforts. Gawlik (2012), for instance, contends that the overemphasis on standardized testing in modern schooling has meaningfully undermined the ability of PBL to have a lasting impact. The significant level of additional PD needed for successful implementation also curtails these efforts, as teachers who have not had substantial training in implementing PBL often fail to stick with this pedagogical approach (Cervantes et al., 2015; Odell et al., 2019), thus undermining efforts to challenge the grammar of schooling.

Changes to K-12 schooling during the COVID-19 pandemic

While research has shown that PBL can reshape classroom and school practices, changing the global K-12 landscape necessitates a widespread challenge to the grammar of schools. And according to Hargreaves and Goodson (2006), historical and social forces located outside of schools can provide the conditions necessary for systemic change to occur. While PBL on its own cannot enact this type of reform, the COVID-19 pandemic could potentially provide the disruption needed to fully act on the transformative potential of PBL as a tool for school change. This disruption becomes amplified when considering what Ladson-Billings (2021) describes as four intertwined pandemics: COVID-19, racism, economic instability, and climate change. These competing social forces have amplified the sudden change in the social fabric caused by the COVID-19 pandemic. Social distancing, economic recession, collective action, political upheaval, and more have certainly provided a drive to reimagine how schools define themselves and raised questions of what we want schools to be moving forward (Ladson-Billings, 2021). For Mehta (2022), the moment can provide an opportunity to challenge the grammar of schooling, but only if education stakeholders foreground student agency and well-being, meaningful real-world learning, and the use of education to reimagine society towards just ends. These shifts, according to Zhao and Watterson (2021), can and should focus on implementing student centered curricula and pedagogies that amplify the affordances of networked technologies. But, as Zhao (2020) argues, the response to rethinking education in the wake of the COVID-19 pandemic does not truly speak to the institution of schooling itself but instead shows a deeper need to reconnect to the notion of learning as a meaningful, humanistic practice. Mapping if and how PBL teachers embody this foundational challenge to the grammar of schooling represents

one avenue for exploring the reform-minded changes that have or have not resulted from the COVID-19 pandemic.

Globally, teachers and students immediately felt the impacts of the pandemic on the day-to-day practices of schooling as they implemented emergency remote teaching (ERT), defined previously as online and distance education praxes applied in the wake of an emergency such as a natural disaster or a pandemic (Anthony Jnr & Noel, 2021; Misirli & Ergulec, 2021; Trust & Whalen, 2020). For most, ERT meant a shift to synchronous online and hybrid learning facilitated through video conferencing software (e.g., Zoom or TEAMS) and the use of learning management systems (e.g., Canvas or Moodle) in distributing learning materials (Marshall et al., 2022). Although some studies did find small benefits for students (such as improved skills related to self-regulated learning and online socialization), most focused on the negative impacts of this forced model of teaching such as the loss of social interaction for students and teachers and negative impacts on disciplinary and socioemotional learning (Huck & Zhang, 2021; Misirli & Ergulec, 2021; Schiller et al., 2023). Moreover, the pandemic also affected social groups differently, with already marginalized or under-resourced populations overwhelmingly receiving the impact (Huck & Zhang, 2021; Kraft et al., 2020), thus revealing the already inequitable distribution of resources that existed before COVID-19 took hold (Ogodo et al., 2021; Tosun et al., 2021). Schools that did successfully weather the storm brought on by ERT did so because they had a network of support for this shift, with administrators and districts investing in and assisting teachers as they developed high quality instructional practices (Kraft et al., 2020) while providing teachers with the flexibility they needed to engage their own agency (Mansfield et al., 2023). Still, researchers and practitioners have identified a need to improve ERT practices and improve online teaching more generally (Anthony Jnr & Noel, 2021; Trust & Whalen, 2020).

The COVID-19 pandemic forced changes at the micro, meso, and macro levels of schooling, from individual student–teacher relationships to national school infrastructures (Tarigan & Stevani, 2021). Organizationally, the needed shift to ERT forced school administrators and districts to push against certain aspects of the grammar of schooling while also revealing the need for school reforms more broadly (Ganon-Shilon et al., 2023). Mifsud and Day (2022), for example, found that the boundaries of what defined the school expanded beyond the individual building or institution to include student's homes and families, a shift that administrators facilitated by pivoting to new organizational routines that supported students outside of the school (Grooms & Childs, 2021) while also revealing the importance of place within educational praxes (Alvarado, 2023). A shift in assessment practices (e.g., cancelling state-wide standardized tests) also allowed for increased emphases on formative assessment and improved teacher practices (Kanjee & Ramollo, 2023). The success of these kinds of changes often relied on the types of leadership employed within schools and districts. Specifically, shared leadership between principals and teachers often led to student growth (Charernnit et al., 2021) and an increased ability to implement reforms (Ganon-Shilon et al., 2023). Yet many schools and districts shifted in the other direction, as the pandemic gave administrators a reason to stifle innovation at the school level and centralized COVID-19 responses limited schools' and teachers'

flexibility (Hubbard et al., 2020; Murphy, 2022). The widespread reopening of schools across the US in the fall of 2021, along with steady patterns of student enrollment, indicated that communities supported a "return to normal" (Dee et al., 2023; Houston & Steinberg, 2022). The ability of the COVID-19 pandemic to affect the grammar of schooling thus remains in question.

Studies have also shown that PBL provides a valuable tool within ERT. For instance, PBL helped students with both academic and non-academic skills, improved their mindset towards learning, and increased their satisfaction with school and motivation to learn throughout the pandemic (Hira & Anderson, 2021; Zahir & Maheshwari-Kanoria, 2022). Additionally, PBL facilitated crucial aspects of education during this time, such as learning how to use technology and incorporating real-world connections and critical thinking skills into pedagogical activities (Anggito et al., 2021; Fleaher et al., 2021; Yuliansyah & Ayu, 2021). Yet manifestations of PBL varied from teacher to teacher, as educators would often highlight different aspects of PBL over others (e.g., collaboration, community involvement) depending on the amount of agency they could exercise within their classroom (Miller et al., 2021). Still, this body of literature provides evidence for the value of PBL within ERT and can contribute to efforts towards school reform in the ongoing pandemic. But researchers need a better understanding of how COVID-19 has influenced the grammar of schooling before they can take these efforts. With this in mind, we now turn towards new empirical evidence revealing how PBL teachers conceptualized school change during this time.

Methods

In responding to our research question, "how do teachers at PBL high schools conceptualize the changes to education that have occurred in response to the COVID-19 pandemic?," we draw on Stake's (1995) notion of an instrumental case study. While most forms of case study research position the case as a representative example of a specific social group, thus gesturing towards the ability to generalize findings, an instrumental case study explicitly considers unique cases that can provide novel insight into singular issues or theories within broader contexts. Our study represents one of these unique cases by specifically focusing on schools already engaged in an ongoing process of school reform through PBL when the pandemic began. Rather than attempting to construct generalizable findings for all schools, our study provides an opportunity to consider the influence of COVID-19 on school change because PBL has already been shown to contribute to school reform efforts (Odell et al., 2019; Ravitz, 2008, 2010; Surakarn et al., 2020) and challenges the grammar of schooling explicitly (Fitzgerald, 2020). We therefore contend that teachers at PBL schools provide valuable insight into the role that the pandemic could play in challenging the grammar of schools because of their predisposition towards new educational practices, thus theoretically positioning themselves as willing to take advantage of the disruption created by COVID-19 in these efforts.

Study context and participants

In bounding our case, we focus on four US schools that participated in our program that explicitly supports teachers and administrators in employing PBL within their school reform efforts. Between a week-long colloquium, multiple professional development sessions, and regular just-in time supports, our instructional coaches and curriculum designers helped teachers develop and implement PBL curricula and teaching strategies. These efforts focused on contextualized teaching materials and practices rooted within the school community, as opposed to providing teachers with a one-size fits all approach to PBL. In doing so, we intentionally conceptualized and supported school reform efforts through a ground up approach, with teachers providing a means for changing instructional practices and school cultures that would then influence change with administrators and within larger educational systems. After representatives from each school participated in a colloquium (with teachers and administrators from across the country) during the summer of 2019 and all educators took part in school-wide professional development opportunities throughout the 2019–2020 academic year, teachers had the option to reach out to our instructional coaches to individually work through problems related to design and implementation they encountered in their classrooms throughout the timeframe of our study. In structuring the program in this way, we rely on findings from research into effective professional development efforts related to PBL by providing generalized curricula and individual mentoring (Becker & Riel, 1999; Whitlock, 2020) alongside contextual learning experiences situated within the school and the individual experiences of teachers (Potvin et al., 2021). Findings from this study also come from the last year of a three-year iterative design process wherein we continuously improved the instructional design of the colloquium and follow up professional development efforts, thus ensuring the value of this program in helping stakeholders build the tools necessary to enact school change.

For this particular study, we spoke to eight teachers from the four participating schools. While the initial study population included thirteen different participants, five of the teachers either transitioned into administrative positions during our research process or dropped out of the teaching profession entirely. In selecting our participants, we intentionally chose teachers from each school to represent a wide range of disciplinary subjects, years of teaching experience, and involvement in the program (represented by their attendance at the colloquium). Table 1 provides details of each participant and school.

Data collection and analysis

To collect data, we conducted three semi-structured hour-long interviews with each participant across a two-and-a-half-year span. The first interview occurred in the Spring of 2020, near the end of that academic year. When we began scheduling these interviews, our initial intention was to research the effectiveness of the PBL instructional coaching program described above and included questions such

Table 1 Demographic information for schools and teachers

School	School type	Minority enrollment	Admin support and school leadership colloquium attendance	Name	Subject taught	Grade level taught	Years of teaching experience	Years of PBL experience	Attended colloquium	Participation in 1:1 PBL coaching & academic year PBL workshops
Johnsonville High	Urban Public PBL-based Charter	69.3%	Yes, leadership attended colloquium	Leslie	Sociology	10	5	1	Yes	1:1 coaching; Attended PBL workshops
				Nancy	Biology	9	10	2	Yes	1:1 coaching; Attended PBL workshops
				Riley	Design	9	12	3	Yes	1:1 coaching; Attended PBL workshops
Shippy High	Rural Public school, with an initiative to incorporate PBL into more classrooms	11%	Yes, leadership attended colloquium	Andrew	History; Independent PBL Courses	9–12	14	2	Yes	No 1:1 coaching; Attended PBL workshops
				Ramona	Biology	9–12	4	2	Yes	1:1 coaching; Attended PBL workshops
Rittman High	Urban Public PBL Charter	73%	Yes, leadership did not attend colloquium	Daisy	Math	9	7	2	Yes	No 1:1 Coaching; No workshops offered
				Jon	Civics Education	9	6	1	Yes	1:1 coaching; No workshops offered
Samson High	Urban Public PBL Charter	51%	Yes, leadership attended colloquium	Elliot	English	9–10	6 months	6 months	No	1:1 coaching; attended PBL workshops

as "What was your experience teaching a recent PBL unit or lesson like?" and "What supports, if any, have you received to help you teach through PBL in your classroom?" However, the sudden emergence of COVID-19 pushed us to include a discussion of the impact of the pandemic on their implementation of PBL. We therefore amended our interview protocol to include questions like "What aspects of PBL are you continuing to teach, what have you dropped, and why?" and "What are the opportunities you are noticing from this change in how schooling is happening?" The next interview occurred during the Spring of 2021, near the end of the "lockdown year" where almost all instruction occurred online or asynchronously. These interviews explicitly focused on the teachers' experience teaching during the pandemic, how they incorporated PBL into their work, and the kinds of school change they noticed. The third interview, one that occurred in the Winter of 2021/2022 after the schools in our study had returned to in-person teaching, followed the same protocol. This included broad and open-ended questions such as "what has teaching over the past year been like for you?" and "how has your use of technology over the past year changed?," providing opportunities for teachers to share their own understandings of school change without presupposing the kinds of shifts they may encounter.

This analysis focuses on moments in the interviews where teachers described shifts in their practice related to COVID-19. While the initial interview did include some reflections on the instructional coaching program, the data included here represents their conceptualization of how they changed their practice amidst this disruption. To achieve this end, all members of the research team began by independently coding the same interview using an open and iterative approach to descriptive coding (Saldaña, 2015). We looked for moments where the teacher discussed components of school change resulting from the pandemic and organized these changes into broad, descriptive categories. We did this with multiple interviews until we agreed on a shared set of codes that included technology, student-driven educational practices, and real-world applications. We then conducted a second round of coding by applying an open and iterative approach to pattern coding (Miles et al., 2020), categorizing our original codes into larger themes relating to where these codes applied within the broader institution of the school. In line with our first-round process, each researcher independently coded the same interview and we compared our codes afterwards. Through multiple iterations, we developed four broad themes for our analysis to understand how teachers conceptualize changes in the wake of the pandemic: curriculum, pedagogy, assessment, and school structure. Definitions of these themes and codes can be found in Table 2.

After establishing this codebook, two of the researchers independently coded each interview from four teachers, so one researcher coded every interview. We then followed Harry et al.'s (2005) consensus building process, collectively reviewing each other's code applications, negotiating any differences that may have occurred, and debating every application until we reached consensus. We therefore highlight the validity of our findings, assured through this collaborative analysis process. We use pseudonyms in the results we share below and all research procedures, including obtaining informed consent, were approved by the home institution's review board.

Table 2 Definitions and examples of codes and themes from analysis

Category	Technology *(Teacher discusses a change in their use of or relationship to technology)*	Student Driven *(Teacher shifts an educational practice to emphasize student agency or student-led processes)*	Real World Application *(Teacher changes an educational practice to be more applicable outside of school)*
Pedagogy	We found that there were a lot of ways that some of the asynchronous moves that we did were really helpful for a lot of students. It allowed us to think about equitable access to teachers and to materials and to learning opportunities. We're thinking about how we can adapt some of those developments into an in-person context. Like, how do we really think about the role of digital learning platforms or students accessing teachers in a variety of different ways? (Riley)	I was giving the kids information up front and saying, "This is what I need, and I need an output. You now have to self-guide and pace yourself. I'm here to essentially be a thought partner with you." It quickly changed into me being way more hands-off than I've ever been ever, but also just really trusting kids to guide themselves. (Daisy)	Just taking time to be more reflective in terms of why we're doing things, I think we tend to want to churn things out. I think being back in person there is also a tendency to fall into that trap of, "We've got to make-up for all this lost time, and we need to be doing research papers." And I think just taking time for acknowledging the humanness of all this stuff that's happening, especially in humanities class. (Jon)
Curriculum	A lot of students were wanting to learn more about how to utilize technology to their benefit. Kids were like, "How do I sort my email and filter and stuff like that?" So it was just cool to do some more of those types of things with students, things that I typically wouldn't have done, because I would have been doing the same routine structure each day. (Daisy)	We rolled out an independent study option for students. We had 12 students who chose advisors and chose a topic. Those advisors led them through an independent study option where they were able to just deep dive into an area that was interesting to them. (Riley)	I carried on this idea of looking at local problems and issues. Since the kids were at home, I was like, "let's look and examine what's going on in our backyards." So you're at home, let's take advantage of this. (Nancy)

Table 2 (continued)

Category	Technology *(Teacher discusses a change in their use of or relationship to technology)*	Student Driven *(Teacher shifts an educational practice to emphasize student agency or student-led processes)*	Real World Application *(Teacher changes an educational practice to be more applicable outside of school)*
Assessment	Because I teach writing, I had to figure out how to give good feedback over zoom last year. I feel like I really narrowed down how to give good, applicable feedback. I figured out how to fit it into my own schedule and time, how to give good writing feedback virtually. (Leslie)	I'm making sure what I'm asking kids to do is truly worth their time. I assign homework every week, but they get to choose what they want to read. And it's very pointed, they know exactly what skill they are practicing and why, how it builds into other skills. Just really honoring student time and student bandwidth. (Leslie)	I'm more committed to the idea that we have to get students involved in things where they can apply their learning. Not this idea that I'm just going to send you 50 worksheets on Google classroom. I can send more work than I've ever done, but I don't know if that's rigorous, if it's what students need. How do we get back to those things that students really need to be successful? (Andrew)
School Structure	We did create a totally online pathway, for the students who felt like that was best for them. (Andrew)	This is one thing where the pandemic has worked out: I'll do office hours. I'll pull up my zoom and I'll have kids in my room for office hours. Kids can just click into zoom if they need it (Leslie)	It's allowing us to really enter into a truly transdisciplinary project space while at the same time allowing some academic time during the day for discipline-specific skill development. The pandemic changed us in making us actually rethink our structures to provide more space for [community-based learning] to happen. (Riley)

Results

To further explore how teachers conceptualized the changes to education that emerged in response to the COVID-19 pandemic, we present findings from our analysis in two parts. First, we discuss the changes that participants recognized within their schools and teaching praxis. Second, we consider the changes that teachers found to have staying power after the return to in-person instruction and the ways that schooling went "back to normal." In doing so, we present insights into how schools changed in the immediate aftermath of COVID-19's emergence and evidence of whether these changes will have long lasting effects on the grammar of schooling.

Changes in response to COVID-19

In discussing the changes that teachers did observe and implement during the first two years of the pandemic, it is worth mentioning that the participants in this study explicitly changed their approach to education. While some of these changes were forced on them or inconsequentially small, they also used this moment to explore new ways of engaging students. As Daisy explains, "I knew this was a really great opportunity to experiment when we never had this chance before. It's reaffirmed that school doesn't have to look the one way, even the one way we were doing PBL." Beyond merely finding ways of reimagining taken-for-granted elements of schooling, Daisy recognized the opportunity to reconsider particular approaches to teaching within her specific school. Building on this shared interpretation of ERT, we found that teachers focused on changes to three elements of schooling: technology use, student-centered educational practices, and real-world applications of learning. They also positioned these elements within the pedagogies, curricula, assessments, and organizational structures of schools. Table 2 provides an example of how each element changed within each of the four aspects of schooling listed here. We use this section to describe each element in further detail and align those elements with various principles of PBL.

Technology

Although somewhat obvious given the nature of lockdowns that occurred across the globe, the COVID-19 pandemic forced a shift in school pedagogies that embraced technology in new ways through ERT. For Ramona, this involved reimagining learning activities within online and asynchronous environments: "everything we did, we had to have an online equivalent. So finding online labs, finding online simulations that they could do, or making something that they could do without assuming that they had everything they needed was very difficult." But this shift went beyond just finding ways of replicating in-person forms of teaching in online settings. As Jacques et al. (2020) note, a core practice of PBL involves using technology as a means for students to engage curricula in ways that break

from the grammar of schooling and the teachers used ERT as an opportunity to further embrace that tenet. Andrew acknowledges this when he asks, "what good is a new piece of technology if you still teach the same way, right? How do we take this new technology and use it better, and really rethink what teachers do, and make it super meaningful?" By considering how to use technology to reimagine teaching practices, rather than as a temporary measure via ERT, Andrew positions the pandemic as an impetus to broadly reframe school pedagogies in alignment with previous findings from Marshall et al. (2022).

Technology also became a curricular focus during the pandemic. At a technical level, this involved helping students understand how to use specific pieces of technology, as shown in Daisy's quote in Table 2 describing how she incorporated explicit teaching about how to use email programs properly. But this also included aspects of critical digital literacy as well. As Elliot notes,

> We've had quick mini lessons many times throughout the year about source biases, how to research credible sources, and what a good source looks like. If they're not getting it at the schools, they're getting it from TikTok or YouTube. And those are way less regulated than what is done here in the schools, so I think that has that trickle effect.

Because Elliot normally teaches 9th and 10th grade English, the transition towards incorporating digital media literacy in his courses represents a logical fit. But the need to engage with social media at the level of curriculum comes directly from the influence of COVID-19 on these technologies. Without the pandemic, the curriculum engaged by these teachers may not have implicitly engaged students in learning about technology, missing a crucial element of PBL implementation (Kokotaski et al., 2016).

Building on Koktaski et al.'s (2016) exploration of PBL implementation, the participants mirrored the findings of these authors by infusing technology into their assessment practices to provide students with meaningful, formative feedback along with upfront information about their assessments. According to Elliot,

> I've tried to be more consistent with having rubrics online and using online [platforms] to do it. I'll have the standard that I want them to achieve. I'll say you either hit it and here's how you did it or I'll write down where or how you can hit it. For them, especially those that go to college, that's such a valuable thing. It's like, "Hey, your professors will leave you feedback, go check it."

While rubrics do not necessarily represent a form of assessment that requires technology (since a rubric can just as easily be printed on paper), Elliot's comments show how an online platform allowed him to amplify valuable aspects of this assessment tool (providing meaningful just-in-time feedback, clearly communicating assessment expectations) for students. Additionally, Elliot connected this technological medium to the kinds of feedback students will receive in college, thus reinforcing the importance of shifting this assessment tool to an online context.

Lastly, the shift in the schools' relationships with technology also impacted their organizational structures. One of the biggest shifts that teachers recognized

in this regard was a move away from the traditional schedule consisting of blocks of time dedicated towards individual subjects and towards a more open, asynchronous, and self-directed approach. Riley described this as follows: "Our seniors are doing independent study projects, and they have a Calendly link with their advisors. They set up times to meet and they work remotely. That's something we probably never would've thought of doing before the pandemic." By embracing online tools like Calendly, the teachers at Riley's school can implement an asynchronous schedule where students independently meet with teachers when they need to, as opposed to all students in a specific class meeting in a set location at the same time. The engagement with new technology thus allowed schools to employ the kinds of open and flexible schedules that allow PBL to flourish (Ravitz, 2008). But the pandemic also led to a shift in the technological infrastructure of schools as well. For Ramona, this involved an overhaul of how her rural school interfaced with technology: "This forced us into the twenty-first century. Every student has a Chromebook now, we have WiFi in our schools, and our teachers, across the board, got more comfortable with finding online tools." Beyond merely changing how individual students or teachers used technology when teaching or learning, the pandemic forced this school to reconstruct how they integrated technology across all aspects of their school culture. In turn, this shift can then trickle down into the other areas of the school where technology use may have been lacking and potentially producing a barrier to PBL implementation.

Student-driven practices

Beyond the shift towards embracing technology, the participants in this study also recognized a shift in school practices towards a student-driven approach where students exercised their agency and made choices about their own learning processes, a crucial element of both PBL (Hira & Anderson, 2021) and school reform efforts during and beyond the pandemic (Zhao & Watterson, 2021). At the level of pedagogy, this involved students deciding which kinds of learning activities they wanted to engage in. Leslie enacted this change by allowing students to create projects of their own choosing: "I gave them different ways they could create an artifact to capture what they'd been working on during the week. It felt a little bit more 'authentically them' that they really picked something they were interested in." Elliot also amplifies this foundational PBL design practice of building pedagogy around student interest and agency (Barron et al., 1998) when he says: "If we want them to engage with these projects and be passionate about [it], we can't force them to do a [specific] project." Instead, Elliot embraced an open approach where students could design projects they found interesting. These participants and others thus emphasized the value of their shift towards a student-driven pedagogy within ERT.

The practice of allowing students to follow their own interests also existed at the curriculum level as teachers allowed students to decide the subjects they learned about. Ramona directly addressed this theme by acknowledging that "just leaning into what my students are engaged in a little bit more, letting them explore what they're interested in, is going to be really helpful for my success and for student

success." This ability also related back to the teachers' embrace of PBL. As Jon explains in his description of implementing student-driven projects,

> a lot of it was helping them develop questions to ask [and] figure out a direction, but they kind of did that on their own. They would say, "I want to read *The Giver*, what should my final thing be?" And then it was just a matter of emailing back and forth and helping them land on a product.

While this quote relates back to the notion of student-centered pedagogies, the choice to allow students to choose their own topic of inquiry and materials exemplifies the nature of student-driven curricula related to this theme and PBL as a whole (Svihla & Reeve, 2020).

In terms of student-driven assessment, the participants described a shift in their grading and feedback practices wherein they assessed student progress individually as opposed to evaluating them all against the same standard, a deeply embedded practice within the current grammar of schooling (Gawlik, 2012). Leslie applied this shift in assessment practices in the following way:

> I have these rubrics where a certain kid might be at a certain spot on the rubric, which means I only give them feedback on these four things on their writing, where another kid is somewhere else on the rubric. It helps me make the most of my time and helps kids that feel overwhelmed by writing. [They can think,] "I just need to get better at these two things right now and then after I get better I can move on." It helps make writing feel more manageable for everyone.

In managing the challenges of the pandemic (along with the suspension of standardized tests at the state level for most), Leslie and others could implement PBL-oriented assessment practices such as these that centered students' individual development instead of summative benchmarks or uniform learning objectives (Barron et al., 1998). COVID-19 therefore created space for participants to challenge this aspect of the grammar of schooling within their classrooms.

A student-driven approach to schooling extended into the organizational structure of schools as well. The shift in school scheduling to allow for asynchronous learning described in the previous section, for example, represents a key example of this theme. Riley very deliberately aligns the work of his school with this theme when he says, "We didn't want to recreate traditional classroom structures. We knew that there are factors that would take students away from their screen or work at any point, but they could access what they needed from teachers." This reimagining of the school day by Riley illustrates how participants abandoned this aspect of the grammar of schooling without sacrificing the support students need: rather than guaranteeing that students receive materials or instruction by making synchronous instruction mandatory, the school made teaching materials accessible so students could engage instruction and communicate with teachers on their own schedules. This approach then supported additional changes to school structures described Riley:

> We have a capstone period at the end of the day that's devoted to interdisciplinary project work. Students form collaborative cohorts [and] have access to all

> their teachers during that time. In the midst of this very siloed time, we were really longing for and thinking of ways to be strategic about increasing collaboration, increasing transdisciplinary and interdisciplinary projects, and so that's been the big structural change.

The change to the structure of the school thus embodied and allowed for the kinds of agency that prove necessary for PBL to succeed (Miller et al., 2021).

Real-world application

Lastly, the participants recognized a shift in schooling practices that aligned the work of schools more closely with the lives of students outside of education, once again mirroring a core component of PBL that involves exploring and engaging with real-world practices (Cervantes et al., 2015). This included both students' lives at that moment and what they would expect to encounter in the future. For Nancy, the change involved having students explore their immediate surroundings as a learning activity: "I had them go out in their yards or outside. There was a citizen's science project where they could contribute to classifying the bugs around them and [recording] the latitude and longitude and describing where they were." Rather than teach through abstracted ideas or in controlled environments, Nancy roots her pedagogy within the lives of students by inviting learners to collect data from their immediate surroundings. Teachers also incorporated this aspect of school change into their pedagogies by more explicitly focusing on socioemotional learning and the wellbeing of students. Ramona describes this shift as follows: "I am more apt to engage students in discussions about personal life. I saw what happened when they were at home for months with very little outside interaction, so I'm going to let them talk." Teachers therefore positioned the need for this kind of socioemotional support within the teacher-student relationship as a response to students' lives outside of school.

Within the curricula teachers engaged, the most prominent shift towards the "real-world" involved a focus on learning about the COVID-19 pandemic. But, as Riley explains, teachers needed to balance this shift with the emotional and mental wellbeing of students:

> A lot of our work was centered around the impact of COVID and doing some ideation about the world that will emerge on the other side. Then we had some students who said, "I need my mind to not be so centered around COVID-19. This is not good for my health." And there were a couple of teachers who said, "we're going to look at something else and we're going to do some other investigations that are relevant to today's world."

Despite the shift away from the virus, the teachers mentioned by Riley still focus the curriculum on real-world events and issues, balancing this curriculum with the kinds of socioemotional learning that Fitzgerald (2020) positions as a crucial affordance of PBL. Elliot describes a similar issue when navigating his curriculum amid the four pandemics (COVID-19, economic instability, racism, and climate change) defined by Ladson-Billings (2021) in the face of government mandates to avoid discussions of these issues: "rather than focusing on social justice, I'm maneuvering

through environmental justice. [Since] we can't talk about class and race and society's issues, we're going to do it through the lens of environmentalism because they want to talk about it." Here, Elliot uses the coexistence of the four pandemics to shift towards a curriculum based in real-world current events, one that also highlights the student-driven nature of this development.

Similar to the discussion of assessment in relation to technology and student-driven practices, the suspension of standardized testing at the state level allowed teachers to reimagine their assessments to align with practices outside of the classroom and more fully embrace and experiment with this transformative aspect of PBL. Daisy provides an example from one of her math classes:

> I don't have to do state testing, so I was like, "Let's do some real-world things." They all talk about Japan. "You want to go to Japan? Cool. You're going to give me a seven-day [travel itinerary]. You're going to do all of the conversions on all of the money," which has been fun to watch.

Rather than assessing students' ability to do conversions through a test, Daisy uses the opportunity provided by the lack of state testing to tie into student interests and devise an activity that they would need to accomplish in a real-world scenario. This aligned with an overall shift in the philosophy of assessment as well. According to Leslie, "the broader theme is making students feel seen. Whatever I give you is going to be meaningful and useful to you and to us as a community. If it's not those things, then we're not going to do it." To this end, the curriculum, pedagogies, and assessment of students all align with the notion of usefulness beyond the classroom within these teachers' responses to COVID-19.

The way that teachers and administrators organized their schools also aligned with real-world applications of learning. Returning to the notion of allowing for more flexibility, Andrew describes one way that students used this opportunity to "do school" outside of the traditional school structure:

> We had two students [who] did an internship. One [student] was supposed to come back to school for his senior year, but because we offered a totally online option, he said, "Why don't I just continue with my internship and do my schooling online?" And the school [worked] that out: He did a year-long internship and he completed everything he needed.

In this instance, the structural flexibility forced upon schools by the pandemic allowed this student to learn by working for a technology company. The structures within the school thus changed to embrace real-world skills and activities beyond traditional curriculum. For Leslie, this shift in school structure also held implications for conceptualizations of school-based learning:

> One thing I've started to kind of talk to our school leaders [about]: how can we create a graduation portfolio that also captures skills that maybe aren't done explicitly in the classroom? We've had these virtual clubs. I do a virtual workout every Tuesday. I also teach a virtual cooking club. That's learning, and growth. How can we capture that? Not meaning to turn it into a class, but can that be on a more expansive diploma?

Structurally, Leslie's school shifted away from containing teaching to only occurring in discrete, subject-based classes and instead moved towards an interest-based model where students and teachers together create virtual clubs where they learn real-life skills not captured on a test. And while the examples provided by Leslie do exist within some extra-curricular activities, her interest in incorporating those activities into a reimagined schedule and a restructured diploma show how the pandemic has allowed this school to reimagine some taken for granted elements of the grammar of schooling.

Persistence of changes

While our findings do give evidence of how teachers conceptualized school change occurring during the ongoing pandemic, this alone does not fully account for COVID-19's effect on the grammar of schooling because, as Hargreaves and Goodson (2006) note, efforts to enact school reforms that challenge the grammar of schooling often revert back to the status quo after short periods of time. Recognizing this tendency, the teachers in this study also discussed the myriad ways in which the changes to schooling that occurred in response to the pandemic would persist or falter. Andrew illustrates this aspect of the interviews in the following statement:

> We need to focus on [asking], what did we learn from the pandemic? How do we get back to the important stuff? What really is the role of the teacher, post-pandemic? And everybody's like, "get back to normal." Well, what do we want to get back to? And to be honest, what are some things we don't want to get back to?

In describing the ways that change may or may not persist in schools, Andrew describes another important theme that emerged in our analysis: the desire to "get back to normal," reverting to a model of schooling that existed before the pandemic. In this section, we describe the ways that teachers conceptualized this return in relation to the themes of technology, student-driven education, and real-world applications while also highlighting the kinds of changes that teachers see as persisting beyond the current moment.

Technology

During the last round of our two-year interview study, the participants described numerous ways schools had either already reintroduced educational practices that existed before the pandemic began or shared a desire to return to these practices. One of these shifts involved a step back from the technological advances that teachers implemented during ERT. Jon positions this move in relation to PBL, describing an interest in rededicating himself to this pedagogical model: "I've been much more inclined to think about the things we really missed with virtual [teaching]. The excitement of, 'we can do a project, we can build something, or we can have a Socratic seminar' have been first priority." While virtual teaching may have provided significant benefits for Jon, these benefits get lost as he emphasizes the kinds

of teaching that can exist within in-person models of education. Outside of this interest from teachers, the participants also recognized this desire to return to normal coming from students as well. As Andrew explains, "we always thought that kids like technology. We thought students like to receive work [and] turn it in on Canvas [and] for us to communicate with them [there.] They don't. They are begging for paper and pencil." While Canvas, a popular learning management system, allowed teachers to facilitate the distribution and collection of materials online during ERT, Andrew's comments show that students would rather engage with physical materials in alignment with more traditional understandings of school practices.

Despite the desire to return to normal described by the participants in relation to technology use, the teachers also recognized some changes that persisted after the return to in-person schooling. As Andrew succinctly explains, "there are some other changes that we've made. Of course, one of them is continuing to use more online learning." While Ramona mentioned in the previous section that her school no longer offered online modes of teaching (potentially because of the rural school's lack of technological infrastructure), the other three schools continued to offer some form of online or hybrid education. At the classroom level, some of the teachers also embraced the technological shift as well. According to Daisy, "I don't use paper anymore because my class lends itself to being on a computer. I'm thankful for having had the [ERT] experience because I have been able to pick up some of those skills to keep everything online." While Andrew described a desire to return to the normal practice of doing school work on paper, Daisy provides an example where she has embraced a digital mode of organizing her classroom. However, she does acknowledge that she would not necessarily do so in all of her classes, revealing the individualistic nature of this change.

Student-driven practices

Additionally, the broad shift towards student-driven approaches to education also reverted to a top-down model in many ways. Jon saw this in the dissolution of the accountability program that had started in his school:

> we established this accountability system. Every person on staff had a group of students and we would find time to check-in each week, look at their grades, see what they're missing, and just have some accountability time. And there was a lot of discussion, like, "this would be really great if we just did this in the school year." That definitely vanished.

Despite the interest shown from the staff, this student-focused program did not survive when the school returned to in-person teaching. But the teachers did not position all of the shifts back to pre-pandemic modes of instruction as negative. According to Riley, "it's allowing us to really enter into a truly transdisciplinary project space while allowing time for discipline-specific skill development. The pandemic [made] us go back to that aspect of our mission and vision." While Jon described a return to a mode of engaging students that aligned with the grammar of schooling, Riley shows how schools also reverted back to what the individual school had done before the pandemic began. Rather than change the school in a new or unexpected

direction, the pandemic had allowed Riley's school to reconnect with a foundational aspect of their school mission that may have gotten lost in the years leading up to this moment.

Yet some of the changes teachers implemented to make their work more student-driven remained. This primarily occurred at the classroom level, with teachers continuing practices related to pedagogy and assessment that centered students. In terms of their pedagogical practices, the teachers emphasized the shift towards socioemotional learning and student wellbeing that began during the pandemic. As Nancy explains,

> We were very intentional about the social-emotional piece, encouraging that part of student development. We had advisory before, but we're doing a lot of check-ins emotionally with our kids during advisory. We're still making sure that our students feel connected to some adult in the building.

Outside of how teachers engaged students in pedagogical interactions, some participants also persistently shifted their assessment practices as well. Ramona illustrates that shift in the following quote:

> As a result of COVID and to adjust to students' lifestyles, I changed my late work policy. It used to be 10% off every day [late]. But I noticed after a certain point they just stop. I would rather have something than nothing. Now they have a week to get it turned in and get full credit. So they get to prioritize what is important.

In both examples, the teachers have shifted their practice to focus on the needs of the students and allow them to structure their educational experience. By letting the emotional or mental needs of students guide their pedagogical interactions and creating space for students to respond to assessments as needed, Nancy and Ramona have reemphasized the student-driven focus of school change that began during the pandemic.

Real-world application

Finally, teachers also recognized a move away from the kinds of educational practices that allowed them to position their teaching in relation to the real world. Beyond the return of state-based standardized testing, the teachers also saw components of their school structure, such as open or flexible scheduling, fade away. According to Ramona, "we're back to five days a week. We do not have a virtual academy or any type of virtual option, so scheduling wise, it's very similar to pre-COVID; five days a week, normal class schedule. It's business as usual." While this lack of flexibility in the schedule removes some opportunities for students to learn through asynchronous engagement with contexts beyond the classroom, the return to pre-pandemic education practices created other opportunities for students to engage with people and communities outside of the school as well. As Andrew explains,

> I'm going to end up with about 30 guest speakers [this] semester. And I think we're getting ready to hit about 10 trips. [My principal] actually canceled my

> last one. He was like, "You've taken these kids out of class every day." Nobody asked to have every field trip, learning experience, etc., canceled for three years. I do what's best for my class.

While the volume of speakers and trips may have changed, the practice of bringing community members into the classroom and students out into the community represents a return to what the school had previously done in alignment with PBL as a model of education. Together, these quotes show that the return to normal involved returning to both what teachers valued and did not value about education.

The participants also recognized elements within their teaching practice and schools where the shift towards embracing real-world applications persisted beyond the transition back to in-person instruction. For Leslie, this persistence reveals itself in her description of how her teaching practice changed:

> I've watched them feel so burnt out from zoom and COVID and uncertainty and housing insecurity and so many things that I feel very attentive to. I have a high bar of what I expect, but I won't waste any of your time helping you get there. I've paired down what's truly more meaningful and just honoring their capacity to carry that load.

Not only does Leslie shift her practice to focus on tasks that represent meaning beyond the classroom, but she also shifts in response to ongoing aspects of the pandemic that continue to effect students. Ramona also connects to the notion of meaningful learning experiences when considering shifts in her curriculum:

> the biggest difference in my personal approach is a change in my mindset of where chemistry falls in the hierarchy of importance in students' lives. My goal is more to make good people than good chemists. I want them to be able to say that their time in my class makes them better prepared to handle situations like this in future.

In describing the shift in this way, Ramona acknowledges a fundamental change in how she views her curriculum. Rather than existing to help students develop knowledge of the subject, she positions her subject as a means to develop students in other ways, a shift away from the grammar of schooling that resulted directly from her experience during the COVID-19 pandemic.

Discussion

Returning to the notion of an "educational reset" that many within the popular discourse claimed should occur as a response to the pandemic, the findings from this study paint a more nuanced picture: although the participants actively used the disruption caused by COVID-19 as an opportunity to experiment with some practices and structures beyond the scope of traditional schooling, the insistence on "returning to normal" provides evidence that this disruption did not have enough momentum to sustain most (but not all) changes teachers positioned as challenges to the grammar of schooling in the long term. These efforts existed alongside other smaller changes

that teachers implemented out of necessity and abandoned when they could return to the more effective practices they employed before the pandemic. We use this section to discuss this assertion in detail before presenting limitations and implications of this study.

COVID-19 vs. the grammar of schooling

As Cuban (2020) notes, changes to the grammar of schooling can occur at an incremental level if teachers and administrators, with the support of other stakeholders, dedicate themselves to the kinds of changes they hope to see in their school environments. In describing the ability to change their educational praxes, the participants in this study all recognized the ability to make these kinds of changes in response to the pandemic. Across the pedagogies, curricula, assessment practices, and school structures of each school, the participants theorized the disruption to education caused by the COVID-19 pandemic as an opportunity to implement and amplify elements of PBL that challenge the grammar of schooling and lead to positive school change (Fitzgerald, 2020; Odell et al., 2019; Ravitz, 2008). While not every change described by teachers rises to the level of embodying school reform efforts, many did. Employing an open schedule and allowing students to co-construct curricula or choose learning objectives, for instance, challenged the taken for granted assumptions that school reform experts recognize as the foundation of the grammar of schooling. Framing these changes and others through the lenses of technology, student-driven practices, and real-world applications, these teachers provide a direct connection between their shifted practice and PBL as a pedagogical and school reform model.

However, the persistent desire to return to "normal" once in-person instruction begins reveals what Marsh et al. (2020) would describe as a lack of momentum necessary to sustain these change efforts and undermine the grammar of schooling. In line with Fullan's (2020) analysis of school reform, this lack of momentum may come from the scale of these changes since the teachers only discussed shifts in the practices of their individual school with any depth. Occasionally, participants would describe district or statewide changes (such as the suspension of statewide standardized testing), but those changes did not last beyond the 2020–2021 academic year, unveiling a lack of momentum in sustaining a challenge to the grammar of schooling at the systemic level. Finally, the lack of change within interrelated social institutions needed for systemic changes in the grammar of schooling to occur (Courtney & Mann, 2021; Hargreaves & Goodson, 2006;) also did not play a role in how teachers conceptualized the changes to schools. But considering the persistence of teachers in wanting to return to schooling practices that existed before the pandemic, the lack of interest in pushing for reform at a higher level proves unsurprising.

But the findings from this study also reveal that some small changes to how schools operate have managed to persist beyond the transition back to in-person teaching. All of the participants recognized small but important shifts in the ways that they engaged technology, situated student agency, and aligned with practices outside of the school. These kinds of changes prove especially important because

of their place within previous scholarship on changing the grammar of schools: embracing new technologies or technological practices (Martínez Arbelaiz & Correa Gorospe, 2009), embodying student-driven modes of schooling (Daniels-Mayes, 2017; Greene Nolan, 2020), and learning through engagement with real-world contexts or practices (Fitzgerald, 2020; Lefstein, 2009) all represent powerful means towards challenging the grammar of schooling. And situating these changes within the classroom also aligns with Mehta's (2022) argument that school change can and should take a bottom-up approach, with new classroom practices leading the way in redefining the grammar of schooling. Although the data presented here cannot speak to the effectiveness of these efforts in the long run due to the time span of the study, the teachers' willingness to conceptualize ERT as an opportunity to experiment with classroom structures, curricula, and pedagogy positions this moment in education as an opportunity to begin that work. But whether or not these shifts do contribute to larger school reform efforts or merely small changes in classroom practice remains to be seen.

Previous research also shows that attempts at school reform often succeed by tightening the relationship between schools and the grammar of schooling rather than loosening or undermining that relationship (Hargreaves & Goodson, 2006). And the changes described by the participants at times reveal a potential strengthening of alignment with the grammar of schooling as opposed to a challenge. The shift towards online schooling, for instance, may undermine the synchronous and in-person elements of the grammar of schooling, but it does not inherently challenge the reliance on standardized testing, the nature of age-level grade systems, the separation of knowledge systems into distinct disciplines, and so on. Additionally, the participants did not present every change during ERT as a positive or agentic one: many teachers consciously returned to specific pre-pandemic teaching practices once in-person schooling returned because they realized that what they had tried or been forced to do during ERT did not work as well, especially in relation to collaborative artifact creation. To this end, changes in schools that do persist moving forward need to undergo further scrutiny to understand their relationship to the grammar of schooling and what kinds of changes students actually encounter and education stakeholders hope for.

When the participants did forward a depiction of schools using the pandemic as a moment of positive change in response to the COVID-19 pandemic, they also described an additional layer of support coming from their schools' ongoing PBL-based reform efforts. In this sense, the participants regularly described the changes they made in their classroom, including those that challenge the grammar of schooling, as being related to PBL. The changes towards student-driven practices, both in terms of students deciding what they want to learn and the emphasis placed on socioemotional learning, align with Fitzgerald's (2020) findings that PBL represents a powerful tool in challenging the grammar of schooling precisely because of these student-centered pedagogical considerations. In many instances where teachers described an interest in returning to a pre-pandemic normal, this sense of normal still presented a challenge to the grammar of schooling because it represents a return to PBL-based schooling. The reintroduction of community involvement and the ability to reintroduce transdisciplinary projects, for instance, both show a

significant divergence from Tyack and Tobin's (1994) original conception of the term that continues to hold sway in schools according to Cuban (2020). As Labaree (2021) argues, school reform relies on the alignment between the actions taken by stakeholders and the mission of the schools. And Riley explicitly recognizes this alignment when describing the return to transdisciplinary instruction when he says, "the pandemic changed us in making us go back to that aspect of our mission and vision from the beginning." To this end, the pandemic did not represent a social force strong enough to overcome the grammar of schooling, but instead represented a momentary reprieve that allowed educators to reimagine and rededicate themselves to ongoing, incremental challenges to the grammar of schooling that existed before the emergence of COVID-19, contributing to these changes but not instigating them on its own.

Limitations and implications

In presenting findings from this study, we acknowledge the limitation related to the small number of participants. A larger population of teachers would have provided us with the opportunity to further explore the relationship between PBL-based reforms and the COVID-19 pandemic with greater nuance. However, we also contend that the amount of interviews and duration of the study still ensures validity and provides a robust data set for us to work with, allowing for a deep dive into the potential influence of the COVID-19 pandemic on the grammar of schools through the lens of PBL-based school reform. Building on our findings, future work should continue to explore the lasting influence of the pandemic on school change. Although we argue here that teachers largely did not continue with changes that could restructure the grammar of schooling, we also found evidence of smaller changes that could persist and potentially build the momentum needed to pose a challenge later on. The lasting effects of these changes will not truly show themselves until some years have passed and the lurking threat of COVID-19 has subsided (if it ever does). Similar interview studies conducted in five, ten, or even more years could shed further light on the influence of ERT in school reform efforts.

Beyond the implications for researchers, we also propose that our analysis can inform policymakers, school leaders, and other stakeholders involved in school reform efforts. At its core, this analysis reasserts the importance of providing structural supports for teachers engaged in a bottom-up approach to school reform efforts. As described by participating teacher Daisy, the pandemic created a space where teachers could experiment with school curricula, pedagogies, and structures in ways they could not under pre-pandemic conditions. But during the year where teachers shifted to ERT, administrators gave teachers the freedom to explore new practices and state/district-wide requirements such as statewide testing also ended. While the "return to normal" did include teachers reinstating quality teaching practices that could not exist under lockdown, it also involved an abandonment of those innovative practices and structures that improved the student experience. Had school leaders been able to maintain the conditions for teachers and schools to experiment during this time, the participants may have had the opportunity to more selectively choose

which changes could persist. Building on this assertion, our findings provide support for previous studies that position PBL as a tool in school reform efforts (Fitzgerald, 2020; Odell et al., 2019; Ravitz, 2008). When the teachers enacted changes that challenged the grammar of schooling, they did so in alignment with the principles of PBL. And when they started to return to normal, they often returned to a pedagogical practice that challenged the grammar of schooling because the school had already implemented PBL within its context. PBL thus provides teachers with the context and tools needed to engage classroom practices that can contribute to ground up school reform efforts.

Conclusion

Despite the routine calls for a reset to education by scholars and public figures alike, a challenge to the grammar of schooling has yet to emerge from the COVID-19 pandemic. As Mehta (2022) argues, the kind of change needed must come from a fundamental reimagining of how schools operate (and what they operate for) alongside a concerted effort to embody this new theorization in practice. But the desire shown by the teachers in this study to return to pre-pandemic education practices represents a barrier in enacting this kind of sustained school reform. Yet, the findings from this study also position ERT during the COVID-19 pandemic as a space of creative reflection on the parts of teachers, allowing them to reconnect with innovative teaching strategies such as PBL, student-centered pedagogies and community-engaged learning that present a bottom-up challenge to the grammar of schooling (Fitzgerald, 2020). To this end, the legacy of COVID-19 and its influence on school reform efforts (much less the end of the pandemic itself) has yet to truly reveal itself. The small, incremental changes described by Cuban (2020) could very well reveal themselves as meaningful influences on education moving forward. But the kind of sweeping, systematic change that many hoped for will need something more than a global pandemic (or, more accurately, four intertwined global pandemics) to truly take hold.

Declarations

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