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What we teach matters

How quality curriculum improves student
outcomes

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Series overview

Across the world, too few education policymakers have seen curriculum as a powerful lever for reforming schools. That might seem surprising. After all, “curriculum” is what we teach, and what we teach surely matters to student learning. As leading curriculum researcher Dr David Steiner of Johns Hopkins University in Baltimore puts it: “What we teach isn’t some side bar issue in American education: it *is* American education”.¹

Yet for some years, curriculum has been overlooked as a pillar of school improvement strategy. Education reform has focused on teacher quality, and often seen curriculum as simply a tool that teachers use. Curriculum’s role as a battleground for ideologues has also led policymakers to avoid the subject. But that is beginning to change.

The research is increasingly clear that quality curriculum matters to student achievement. What’s more, there is emerging evidence to suggest that quality curriculum has a larger cumulative impact on student achievement than many common school improvement interventions – and at a lower cost.

Much recent research on the impact of curriculum on student learning has emerged from the US since the development of the Common Core State Standards. While the definition of curriculum remains contested (see our working definition overleaf), this research focuses on content-rich, standards aligned curriculum materials, especially textbooks. Several US states and districts, such as Louisiana, have begun to develop systems to identify and make available high-quality curriculum materials – and the approach seems to have paid off. The experience of these American states and districts reinforces some of Learning First’s research findings in high-performing systems such as Finland, Singapore, Japan, Hong Kong, and British Columbia. In these places, high-quality curriculum is always part of the story.

Of course, what we teach matters. But what does this mean for educators and policymakers? How do we ensure that schools have the support they need to select or develop high-quality curriculum aligned with rigorous standards for student learning? How do we narrow the gap between the achievement standards that sit on department of education websites, and what is *actually taught* in classrooms? How can policymakers meaningfully engage with teachers, support and make the most of their instructional expertise, and encourage uptake of quality curriculum? What is there to learn from how other systems have designed and implemented standards and curriculum, and what are the implications for related policy levers, especially initial teacher education, ongoing teacher professional learning, and student assessments? Finally – and critically – how do we define high-quality curriculum in the first place?

The answers to these questions have profound implications for education policy in Australia, the United States, and around the world. This series of reports, – a collaboration between Learning First and Johns Hopkins Institute for Education Policy – draws on international research to help inform the conversation.

This report, *What we teach matters*, defines quality curriculum and sets out the contemporary evidence on its impact on student learning, with a focus on research from the United States. It argues that developing and implementing quality curriculum is an important next step for many school systems internationally. Further reports in the series will examine the interaction between curriculum and other key policy levers, including initial teacher education, teacher professional learning, and student assessment; offer case studies of how educators and system leaders in Louisiana and British Columbia select or develop quality curriculum and encourage its use; and consider the implications for policymakers in the United States, Australia, and abroad.

¹ Steiner, 2017, p. 11.

Box 1: Defining “curriculum”

“Curriculum” is a notoriously contested term. In a recent blog post, Chester E. Finn, Jr. of the Thomas B. Fordham Institute likened the line between standards and curriculum to “the pavement on Copacabana Beach. No two people describe it in the same way”.² Such varying definitions within and among school systems muddy the waters of an already complex debate about the role of curriculum in school improvement. A shared understanding of the term “curriculum” is required before any collective consideration of its impact on student learning can occur.

When Australians talk about “curriculum”, they tend to be referring to the Australian Curriculum or its state derivatives – frameworks of standards, alongside content descriptions, general capabilities and cross-curriculum priorities.³ Conversely, when Americans talk about curriculum, they tend to mean textbooks or other day-to-day instructional materials. The definitions below are rooted in the American context to more usefully support international readers’ interpretation of the research set out in this report series:

Standards are expressions of the goals of student learning, typically at the state or federal level. Standards typically aim to outline what we expect students to know and be able to do at different stages of schooling, usually expressed in year levels.⁴ Examples of standards include Achievement Standards of the Australian Curriculum, and the Common Core State Standards in the United States.

Curriculum is the means to achieve the goals expressed in the standards. It is the teaching and learning program, and can include lesson plans and activities, scope and sequence documents, textbooks, computer programs, and even related pedagogical advice and embedded formative assessments.

² Finn, Jr., 2017.

³ For more information, see <https://www.australiancurriculum.edu.au/f-10-curriculum/structure/>

⁴ Houchens, 2017.

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1 Defining quality curriculum

If “curriculum” is a notoriously contested term, then, of course, “quality curriculum” is too. In the simplest terms, curriculum is high quality when it helps produce teaching that drives student learning. But the simplicity of this definition belies its complexity, and it requires some unpacking. To do so, it’s useful to consider three questions:

1. **Does the curriculum support effective, research-based pedagogy?**
2. **Is the curriculum content-rich?**
3. **Is the curriculum standards-aligned?**

Each of these questions is considered below in turn.

Does the curriculum support effective, research-based pedagogy?

If “curriculum” is the means to achieve the goals expressed by standards, as the definition in Box 1 on page 4 above suggests, an important bar for quality is that these “means” are informed by best practice research. Curriculum should reflect the evidence base of effective teaching – or, at the very least – not encourage practice that is known to hinder student learning.

There is an increasingly robust body of evidence on effective teaching practice. Contemporary research has demonstrated the efficacy, to varying degrees, of a range of teaching strategies, including goal setting,⁵ peer tutoring,⁶ formative assessment,⁷ and feedback,⁸ to give a few examples. High quality curriculum should help produce teaching that includes evidence-based practices such as these.

The research evidence also underlines the importance of teacher pedagogical content knowledge.⁹ Pedagogical content knowledge underpins teachers’ ability to evaluate thinking behind students’ methods, identify common misconceptions, and progress student learning.¹⁰ In historically high-performing countries such as Finland, student textbooks are sometimes accompanied by teacher manuals that include theoretical and conceptual content knowledge for teachers about the subject to support their pedagogical content knowledge.¹¹ Box 2 below describes an American curriculum resource called the “Number Stories protocol” that sets out possible student responses to a problem, and strategies teachers can employ to best support student learning in each situation. While the impact on student learning of this curriculum resource has not been examined, and further research here is needed, it does provide a good example of what it looks like when curriculum explicitly scaffolds teacher pedagogical content knowledge.

Box 2: Example from a Kindergarten mathematics class in New Orleans, Louisiana

Ms Adams is teaching her Kindergarten mathematics class using the Number Stories protocol from Achievement First, a detailed lesson plan to teach counting. Following the lesson plan, Ms Adams begins the class with a two-minute “Visualization”, in which she reads the problem and asks students to visualise it:

Teacher: “There are nine red lights and 12 green lights shining on the tree.”

Students: “There are nine red lights and 12 green lights shining on the tree.” (Repeated x 3)

⁵ Hattie 2009.

⁶ Hattie 2009; Education Endowment Foundation 2015; Kyndt et al. 2013.

⁷ Black and Wiliam 1998, Kingston and Nash 2011; Kyriakides, Christoforou, and Charalambous 2013.

⁸ Hattie 2009; Hattie and Timperley 2007.

⁹ See, for example, Ball, Thames, & Phelps, 2008; Jensen, Roberts-Hull, et al. 2016b; Shulman, 1986.

¹⁰ Coe et al. 2014.

¹¹ Jensen, Roberts-Hull, Magee, & Ginnivan, 2016.

Teacher: “Alright friends, we’re going to make a mind movie!”

Students cover their eyes and visualise what nine red lights and 12 green lights shining on a tree looks like.

Ms Adams then moves into the 18-minute “Represent, Retell & Solve” section of the lesson:

Teacher: “Alright friends, we’re going to represent and solve! How many lights are there on the tree altogether? When you write your answer in a box on your whiteboard, I’ll know you’re ready.”

Students begin to draw what they think nine red lights and 12 green lights shining on a tree would look like, and how many lights there would be in total.

Ms Adams then asked students to share their answer and reasoning with a peer, using the model articulated in the lesson plan: “First I did X, because the story said Y, and I solved the problem by...”

As students were doing this, Ms Adams surveyed student responses to determine what proportion of the class had solved the problem correctly. Her lesson plan provided three different discussion protocols that could be used, depending on the proportion of students who had correctly solved the problem:

- If more than half the class had solved the problem using different strategies, Ms Adams knew to ask two or three students to share their “solve strategies”, and to ask the class about the similarities and differences between the strategies, to elicit a discussion about which might be most sophisticated or efficient.
- If more than half the class had solved the problem correctly but had only used one strategy, Ms Adams knew to share one or two new solve strategies, either by connecting this activity to a previous activity, or by talking about a different solve strategy that she “saw a kid do last year”.
- If fewer than half the students had solved the problem correctly, Ms Adams knew to ask one student with the correct answer to share their approach, and one student with an incorrect answer to share their approach, and then lead a discussion about which strategy leads to the solution.

More than half the students had solved the problem, so the discussion focussed on the comparative benefits of “counting on”, a strategy employed by a student, Yardis, to solve the problem, and “counting all”, a strategy employed by Camila. After a discussion, students agreed that Yardis’ approach was more efficient. To end the class, Ms Adams moved into the two-minute “Finish the Story” section of the lesson, where students express the problem and solution in pairs and then with the whole class.

Source: Magee and Jensen (2018)

We also know that some teaching strategies are ineffective. One common example is drilling students on isolated reading comprehension skills like “finding the main idea”¹² instead of taking an integrated approach to the teaching of reading comprehension in the context of a specific content area. Low quality curricula might encourage teachers to pursue these kinds of pedagogical strategies that are known to be ineffective.

Is the curriculum content-rich?

Content-rich curricula are a common feature of high-performing school systems internationally.¹³ A content-rich (also sometimes called “knowledge-rich”) curriculum is a rigorous curriculum that does two key things. First, it maintains high expectations for all learners. Second, it deliberately builds their knowledge and vocabulary – the foundation on which reading comprehension, critical thinking and a range

¹² See, for example, Hirsch, 2016.

¹³ Common Core, 2009.

of other skills depend.¹⁴ According to the United States-based Knowledge Matters campaign,¹⁵ content-rich curricula can be characterized in the following key ways:

1. **It's specific.** *Topic by topic, the specific content children will learn throughout the year should be clearly stated. For example, “compare and contrast three ancient civilizations” is too vague; “compare and contrast ancient civilizations in China, Egypt, and the Middle East” offers better instructional guidance.*
2. **It's cumulative.** *Grade by grade, the specific content should be cumulative, ensuring that children are developing both deep and broad knowledge – that they are not studying ancient Egypt twice without ever being introduced to ancient Greece. Only by collaboratively mapping out the topics for each grade can educators ensure that their curriculum does not have boring, repetitious or problematic gaps.*
3. **It's well rounded.** *Not only are the sciences, social studies, and the arts necessary for reading comprehension because of the knowledge and vocabulary they convey, these subjects are inherently interesting. They bring wonder and excitement to the classroom, making them necessary to inspire a love of learning.*
4. **It's preparatory.** *From literature to chemistry to music, each discipline offers far more engaging and enriching content than could possibly fit into the primary years. Educators should select the content that offers the best preparation for later studies. While some time could be set aside to pursue children's interests, children do not know what background knowledge is necessary to succeed in challenging courses in later grades.*
5. **It's rigorous.** *Even in kindergarten and first grade, children are ready for rigorous academic topics. But rigorous does not mean stressful or boring. Young children can enjoy complex topics if they are immersed in a carefully planned series of read-alouds, discussions, and projects that start with a basic introduction and build toward a deeper understanding.¹⁶*

A common feature of top-performing countries across the globe is a content-rich curriculum. The most extensive study,¹⁷ performed by a research team at Common Core, Inc. found that a comprehensive, content-rich curriculum was the salient feature in nine of the world's highest-performing school systems as measured by the Programme for International Student Assessment (PISA). Despite the vast cultural, demographic, political, and geographic diversity of Finland, Hong Kong, South Korea, Canada, Japan, New Zealand, Australia, the Netherlands, and Switzerland, their educational systems all shared an emphasis on content-rich curriculum and commensurate standards and assessments.¹⁸

As Dr. Ashley Berner of the Johns Hopkins Institute for Education Policy has reported:¹⁹

The positive effects of high-quality curricula shouldn't perhaps surprise us; most democracies around the world require all schools to teach a common body of knowledge, and a comprehensive, content-rich curriculum is a signature feature of high-performers. The OECD's 2012 report²⁰ on excellence and equity across its 38 member- and 31 partner-nations notes, for instance, that the most equitable countries expose all students, not merely those deemed “gifted,” to high-level mathematics. The International Association for the Evaluation of Educational Achievement concurs, having found in its analysis of the TIMSS assessment that a critical in-school factor in low-income students' success was

¹⁴ Knowledge Matters, n.d.

¹⁵ For more information, see <http://knowledgematterscampaign.org/>

¹⁶ Knowledge Matters, n.d.

¹⁷ Common Core, 2009.

¹⁸ Common Core, 2009.

¹⁹ Berner, 2018b.

²⁰ OECD, 2013.

“an environment of high academic achievement”.²¹ Two specific examples: the Netherlands and Alberta, Canada, fund a diverse number of schools (from Catholic to Montessori), require them all to follow the same, sequenced curricula, and are among the world’s most equitable and high-performing school systems.²²

Looking in more depth at Alberta, Canada is instructive. The content of the provincial curriculum of Alberta, Canada, had diminished such that by the 1970s, high schools required only two subjects for graduation – social studies and English.²³ In the 1990s, the government changed course (as a result of the concerted efforts of parents and civic organizations) and established curricular frameworks, created authorized resource lists for each course, and set proficiency standards that were modeled on the PISA exam.²⁴ Alberta is now among the world’s most equitable and high-performing school systems.²⁵ The negative evidence is also important: in his most recent book, *Why Knowledge Matters*, E.D. Hirsch traces the rapid decline of academic results from all sectors of French school children in the years after that country abandoned its national, content-rich curriculum.²⁶

Is the curriculum standards-aligned?

If we accept that “Standards” reflect the end goal of learning and “Curriculum” is the means to achieve those ends,²⁷ then evaluations of curriculum quality must consider the extent to which specific curricula aligns with the relevant standards. Until recently, standards alignment has been a key feature of most definitions of curriculum quality emerging from the United States and is consequently a focus of curriculum review processes across the country.²⁸

However, very recently, some proponents of quality curriculum – including series co-author Professor David Steiner – have turned a critical eye to the inherent value of standards-alignment. Of course, the alignment of curriculum with the relevant standards is a reasonable marker of quality – but only if the standards themselves are likely to produce effective teaching practice. However, this is not always the case. For example, consider the following English Language Arts anchor standard from the Common Core State Standards:

CCSS.ELA-LITERACY.CCRA.R.2: *Determine central ideas of themes of a text and analyze their development; summarize the key supporting details and ideas.*

This standard, like most state standards in the United States, is largely skills-focused. Consequently, many curricula in the United States, especially in English Language Arts, focus on skills rather than on knowledge in the way described above. This is unsurprising, given the fact that it has been notoriously difficult to agree upon which key texts student should read or which areas of knowledge they should master, particularly in middle and high school.

Ultimately, however, skills-based standards – and related assessments, such as PARCC and SmarterBalanced in the United States – inevitably encourage teachers to drill students on skills in a way that is educationally unproductive. These assessments focus on the “skills” set out in the Common Core State Standards by requiring students to read passages from texts most of them have never seen before, and then answer questions about finding the main idea, inferences, and evidence for conclusions.²⁹

²¹ IEA, 2015.

²² Berner, 2018a; OECD, 2013.

²³ von Heyking, 2006.

²⁴ McEwen, 1995.

²⁵ OECD, 2014.

²⁶ Hirsch, 2016.

²⁷ Houchens, 2017.

²⁸ See, for example, Magee & Jensen, 2018.

²⁹ A forthcoming paper in this series will explore the issue of assessment.

Contemporary research demonstrates that this type of teaching practice does not effectively support student learning over the long term.³⁰ Therefore, we must question the value of automatically including “standards alignment” in our definitions of quality curriculum.

To be clear, strong readers can find the main idea. The problem is that drilling for this skill actually undermines the capacity of students, since finding the main idea depends on knowing the subject matter of the text in front of them, not mastering an illusory skill. Strong standards can play an important role in describing the skills and knowledge students should acquire as a result of their schooling. However, when curricula translate those skills into drills at the expense of knowledge, aligned curricula is likely to encourage ineffective teaching practice – and so it cannot be considered “high-quality”.

³⁰ Hirsch, 2016.

2 Quality curriculum improves student learning

A number of research summaries over the last few years have brought attention to the impact that high quality curriculum can have on student learning.³¹ These suggest, for example, that switching from a low- to a high-quality textbook can boost student achievement more than other, more popular interventions such as expanding preschool programs, decreasing class sizes, or offering merit pay to teachers.

Studies cited by the What Works Clearinghouse (WWC), which is managed by the US Department of Education's Institute of Education Sciences (IES), point to multiple curricula that produce positive effects on students' reading. Open Court Reading,³² for instance, brought gains of 10 percentile points³³ and Success for All saw 19 percentile point gains.³⁴ In math and science, the WWC found that the University of Chicago School Mathematics Project (UCSMP) curriculum yielded gains of up to 23 percentile points³⁵ and the TEEMSS Science gains were 24 percentile points.³⁶ Put differently, schools that switched from business as usual to one of these curricula could move students' performance from the 50th to the 60th or even 70th percentile.

The shift from a weak curriculum to a strong one can make an especially strong difference. Tom Kane of Harvard University finds that:

Two textbooks were statistically significantly related to students' performance—one positively and one negatively. The average student using GO Math! (Houghton Mifflin Harcourt) as their primary textbook scored 0.1 standard deviations higher (4 percentile points) than similar students using other textbooks or no textbook at all. In contrast, the average student using another textbook scored 0.15 standard deviations lower (6 percentile points) on the new math assessments. (We are not releasing the name of the second textbook because we could not confirm which edition teachers were using.) Both estimates are sizable, implying that textbook choice is a high-stakes decision.³⁷

The “spread” between the two textbooks' impact is a 0.25 standard deviation—a 10 percentile point gain.

Recently, researchers used schools' textbook selections as well as school-, district-, and student-level data (2008–13) to compare the effects of four commonly used elementary-school math curricula: enVisionMATH California,³⁸ published by Pearson Scott Foresman; California Math,³⁹ published by Houghton Mifflin; California Mathematics: Concepts, Skills, and Problem Solving, published by McGraw-Hill; and California HSP Math,⁴⁰ published by Houghton Mifflin Harcourt. They found that students who had been taught using Houghton Mifflin's California Math consistently outperformed students who had been taught using a composite of the other three on state assessments: “The effects persist across four years post-adoption and range from approximately 0.05 to 0.10 standard deviations (i.e., up to four percentile points) of student achievement”.⁴¹

³¹ See, for example, Partelow & Shapiro, 2018; Whitehurst, 2009; Boser, Chingos, & Straus, 2015.

³² For more information, see: <https://www.mheducation.com/prek-12/program/open-court-reading-20162016/MKTSP-THA14M0.html>

³³ Borman, Dowling, & Schneck, 2008.

³⁴ Schröer, 2014.

³⁵ Hirschhorn, 1993.

³⁶ Zucker, Tinker, Staudt, Mansfield, & Metcalf, 2008.

³⁷ Zucker et al., 2008.

³⁸ For more information, see: <https://www.pearsonschool.com/>

³⁹ For more information, see: <https://www.eduplace.com/math/hmcam/>

⁴⁰ For more information, see: <http://www.harcourtschool.com/hspmath/ca/index.html>

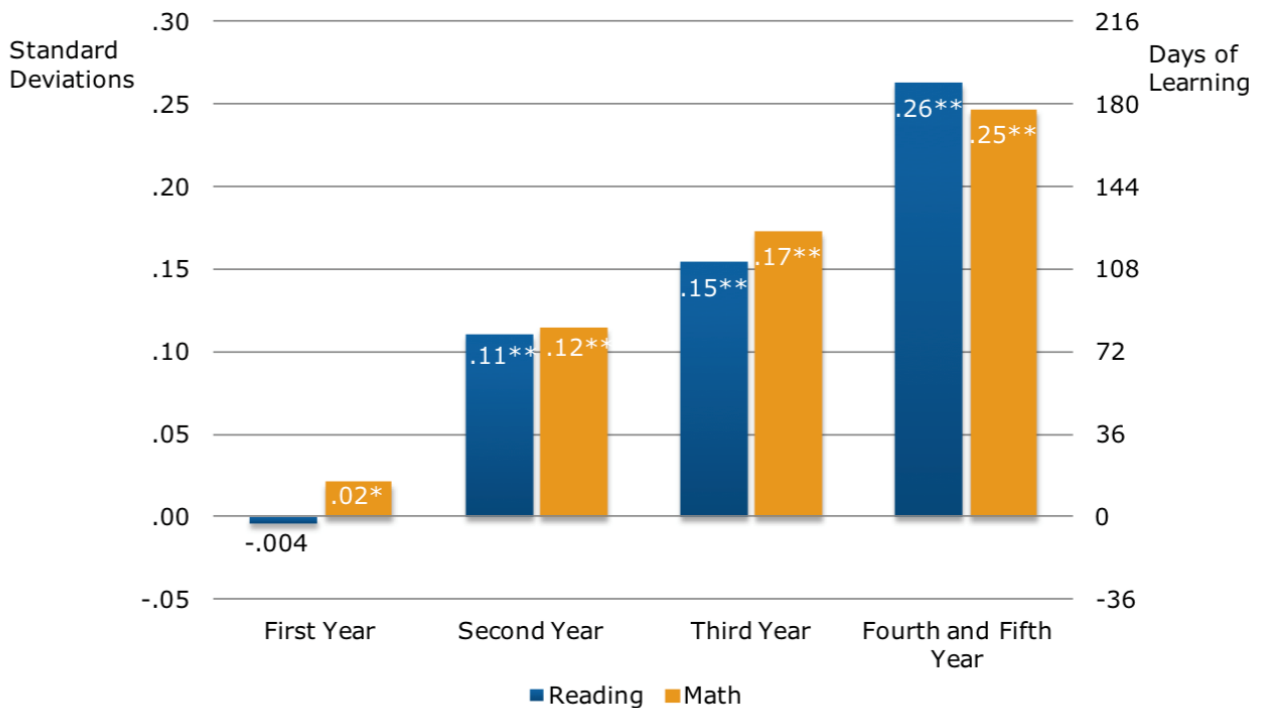
⁴¹ Koedel, Li, Polikoff, Hardaway, & Wrabel, 2016.

2.1 The cumulative impact of high-quality curriculum can be significant

Most research studies focus on the impact of a curriculum over one or two years. But over time, even a small annual effect can compound to make a big impact. A WWC “Intervention Report,” which examined research studies on the impact of the University of Chicago School Mathematics project, reports that a longitudinal study⁴² found that students who were taught using a high-quality math curriculum for four consecutive years (grades 7–10) outpaced comparison students by a margin of 23 percentile points – an effect that amounts to a stunning four additional years of learning.⁴³ When extrapolated across an entire class, grade, or school, such impacts could prove transformative.

We also know that some of the charter school networks which stress high-quality, content-rich curriculum, show out-sized gains that add increased learning for students for every year that they stay in those schools. For example, Figure 1 below reflects the results that CREDO, a Stanford University based research team, found in a study of Charter Schools in New Orleans, Louisiana.⁴⁴ However, there is no question that we need more research in this domain. We know that correlation does not equal causation, and further work is needed to better understand the role of curriculum in these kinds of success stories.

Figure 1: Impact by years of enrolment



Source: Center for Research on Education Outcomes, 2013

⁴² Hirschhorn, 1993.

⁴³ What Works Clearinghouse, 2016.

⁴⁴ Center for Research on Education Outcomes, 2013.

3 Quality curriculum is a cost-effective school improvement lever

Quality curriculum is a cost-effective school improvement lever, because effective curricula cost on average no more than weak curricula. For example, a study by Boser, Chingos and Straus (2015) found that:

Higher-quality curriculum in elementary school math can come at a relatively low cost. The authors analyzed six pairs of curricula, where each pair included a lower-quality and higher-quality version. The authors looked at how much it would cost for a school to switch from a lower-quality product to a higher-quality one in elementary school math and found there's not much of a cost. In fact, the data that the authors collected from 19 states indicate that publishers tend to charge all states roughly the same. These findings mean that nearly all opportunities for boosting ROI (return on investment) are a matter of choosing the best product, not finding a better price.⁴⁵

When it comes to mathematics curricula in the early grades, there is little relationship between the cost and quality of instructional products. Prices do not vary widely across products, with the most expensive product in the same government-sponsored study costing only \$USD 13 per student more than the least expensive product.⁴⁶ If anything, the higher-quality products tend to cost less, and in some instances, the most expensive curriculum was among the least effective and the least expensive was among the most effective.

Among the less expensive curricula are those made available online in an OER (Open Education Resources) format. In this instance, the basic curriculum is available for free downloading, with the costs restricted to printing and, in some cases, to supplemental material. EngageNY,⁴⁷ for instance, is a widely used OER resource available free of charge. In 2015, Duval County began to use EngageNY districtwide. Their internal audit indicates that the district saved more than \$10 million over three years by using OER and printing the materials rather than using published curricula.⁴⁸ At the same time, the academic results from Duval county since the introduction of the EngageNY curricula have been very positive.⁴⁹

In summary, as Polikoff and Koedel put it in their study *Big bang for just a few bucks: The impact of math textbooks in California*, "Textbooks are relatively inexpensive and tend to be similarly priced. The implication is that the marginal cost of choosing a more effective textbook over a less effective alternative is essentially zero."⁵⁰

⁴⁵ Boser et al., 2015.

⁴⁶ Boser et al., 2015.

⁴⁷ <https://www.engageny.org/>

⁴⁸ Johns Hopkins Institute for Education Policy, 2017.

⁴⁹ Duval County Public Schools, 2018.

⁵⁰ Koedel & Polikoff, 2017.

4 The current state of curriculum implementation

Despite the increasing local evidence on the impact of curriculum quality, teachers in much of the United States – and many parts of Australia, and other systems internationally – continue to develop and select a wide range of curricula of varying quality. As Steiner (2017) reports in his review of the evidence,⁵¹ a recent RAND Corporation report, *Implementation of K–12 State Standards for Mathematics and English Language Arts and Literacy*, explores the issue of what teachers across the United States are actually using by way of curriculum. Teachers reported using a variety of curriculum from a wide array of sources: formal, published curricula and informal, online lessons; self-developed and district selected; and aligned to standards or not:

- 82 per cent of elementary and 91 per cent of secondary school mathematics teachers reported a very high use of self-developed and self-selected materials.
- 89 per cent of elementary and 85 per cent of secondary-school English Language Arts teachers reported using their own materials “at least once a week”.⁵²

Similarly, researcher Tom Kane of Harvard University’s Center for Education Policy Research found that 80 per cent of English Language Arts and 72 per cent of mathematics teachers drawn from a representative sample in five US states reported using self-developed curriculum more frequently than other materials.⁵³

These findings raise the question: what curricula are teachers self-selecting to implement in their classrooms? The RAND report showed that teachers rely on a wide variety of online resources to source curricula, with Google, Pinterest, and Teacherspayteachers leading the list.⁵⁴

Why is this a problem? The issue is not with the fact that the resources are online. Such materials *can* be strong, and even downloading materials for a single lesson can add value to a lesson.⁵⁵ Rather, there are three key issues associated with teachers self-selecting a range of online curriculum to implement in their classrooms.

First, having teachers create their own lessons over time will rarely result in a fully sequenced, coherent learning experience for their students, still less one that enables those students to benefit from a known, highly-effective curriculum. Schools of Education across the United States simply do not prepare future teachers for the many skills that would be required to turn them into effective curricula designers. Thus, teachers trying to cobble together lessons from a wide variety of online and textbook resources are largely doing so without any professional training. This issue, including a discussion of what might be done about it, is discussed in detail in the forthcoming report in this series *Creating curriculum-literate teachers*.

Second, teacher workload and the opportunity cost of their time is an important factor. Why should all teachers across a district, state or country be expected to develop their teaching and learning programs from scratch, when they might instead be supported to adapt or build on existing materials? Far from feeling as though they are being “done to”, teachers we have interviewed in both the United States⁵⁶ and Australia⁵⁷ have expressed a strong preference for access to high-quality curriculum materials they can adopt and adapt to suit their classroom contexts.

⁵¹ Steiner, 2017.

⁵² Opfer, Kaufman, & Thompson, 2016f.

⁵³ Kane, Owens, Marinell, Thal, & Staiger, 2016.

⁵⁴ Opfer et al., 2016.

⁵⁵ Jackson & Makarin, 2018.

⁵⁶ Magee & Jensen, 2018.

⁵⁷ Learning First research in Australian school systems.

Finally, the large variation in the curriculum used within and between schools hampers systemic school improvement efforts. When systems don't know *what* is being taught, it is difficult to know *how* it is being taught and what support teachers and school leaders might need to improve teaching and learning. For example, while a system might choose to pursue a numeracy strategy in response to poor results on state tests, they probably won't know how best to target professional learning and other resources if schools across the state are using different mathematics curricula of varying quality.

5 Conclusion: using quality curriculum as an anchor for school improvement

Curriculum quality matters. Despite this fact, millions of students in the United States, Australia and elsewhere are still being taught with poor quality materials and/or with materials that are assembled by teachers who are time poor and unprepared to exercise the many skills on which the development and teaching of quality curriculum depend. In addition, these teachers are often under-supported by the education bureaucracies in the systems they work in.

What is encouraging is that American education policy makers are starting to demonstrate their awareness of the research on quality curriculum – and put it into action. Perhaps most strikingly, under John White’s leadership, Louisiana’s Department of Education has partnered with their teachers – successfully – to support and incentivize the use of high-quality materials.⁵⁸ A case study published as part of this report series, *Lessons from Louisiana: how quality curriculum can scale school improvement*, describes in detail how the Louisiana Department of Education achieved this change. Box 3 provides a short excerpt.

Box 3: Excerpt from *Lessons from Louisiana: how quality curriculum can scale school improvement*

The history of the state of Louisiana has not been known for educational success. One of the poorest states in the country, its schools have consistently been among the lowest performing.⁵⁹ While Louisiana’s reading and mathematics scores are still significantly lower than the US average,⁶⁰ improvements on several key measures began to catch the attention of educators and policymakers around the world in 2015. This improvement raised two questions: what had changed in Louisiana, and what are the lessons for other school systems?

The introduction of the Common Core State Standards, a set of rigorous standards in mathematics and English Language Arts, were a catalyst for reform in Louisiana. Remaking the Louisiana Student Standards to align with the Common Core represented a significant shift for school education. Before this, there was no coherent curriculum to inform classroom instruction; instead, “teachers just had access to a bunch of disconnected activities under a framework”.⁶¹

While many states stopped reforming their curriculum once they had simply adopted or adapted the Common Core State Standards and aligned assessments, Louisiana kept going. The team at the Department understood the potential of curriculum, more than many other school improvement levers, to truly influence day-to-day teaching and learning in classrooms. As former Assistant Superintendent of Academic Content, Rebecca Kockler, explains: “once we realized the potential of curriculum to see improvements in classrooms at scale, it became the core of our theory of change”.⁶² Led by Kockler and state Superintendent John White, the Academic Content team devised a strategy to ensure that all teachers in Louisiana had access to high quality curriculum materials and were supported to use them effectively in their classrooms.

The quality curriculum strategy is changing teaching and learning in Louisiana, and teachers are the first to say so. As one explains, “It’s been a complete shift to an academic environment. Before, it was social, enjoyable – it wasn’t about learning. Now it’s a deep dive on learning. I realize now that I never got below surface level before”.⁶³ For many teachers, consistently implementing quality curriculum has meant fundamentally transforming their professional practice, which is clearly challenging.

⁵⁸ Kaufman, Thompson, & Opfer, 2016; Pondiscio, 2017.

⁵⁹ In the 2017/2018 academic year, more than 700,000 students were enrolled in public schools in Louisiana. Sixty-seven per cent of these students were considered economically disadvantaged. See Louisiana Department of Education, 2017b. The state has consistently scored below the national average in the National Assessment of Educational Progress since it was first administered at the state level in 1998. See National Center for Education Statistics, n.d.b, n.d.a.

⁶⁰ The Nation’s Report Card, n.d.

⁶¹ Interview with Louisiana educator.

⁶² Interview with Assistant Superintendent Rebecca Kockler.

⁶³ Interview with Louisiana educator.

Yet teachers are up for the challenge because they can see the payoff: “You need to take the bad with the good. You might have to sacrifice a few of your freedoms, but you’ll see students performing at a level that will make you so happy. It will give you more information about student learning than you had when everyone was doing their own thing – you will see what does and doesn’t work, and you will be a better teacher for it”.⁶⁴

Louisiana is still on its improvement journey. Make no mistake, it is a long-term, comprehensive change strategy that has required political mettle and a lot of what Kockler describes as “stick-with-it-ness”. It’s not just about making sure quality curriculum is available to all teachers, though that is an important first step. It’s about getting teachers on board to create quality curriculum when no curriculum publisher can meet the bar.⁶⁵ It’s about aligning professional development and student assessment with curriculum so that teachers are supported and held accountable for implementing it, and about managing stakeholders and controlling communications in and outside schools so that teachers can get on with what matters.

Source: Magee & Jensen, 2018

Further, American leadership organizations such as Chiefs for Change are now on the record as advocating for the shift to strong curricula.⁶⁶ We are seeing more articles in education journals bringing attention to best practices.⁶⁷ There are also an ever increasing number of case studies of teacher- and district-led adoptions.⁶⁸ Finally, practitioners are starting to understand that strong, content-rich curricula matters especially for economically disadvantaged students, as Dr. Sonja Santelises, Superintendent of Baltimore City Public Schools, wrote recently in the *Washington Post*:

Uneven, scattered curriculum isn’t just boring or confusing; it can widen the gaps between students from affluent backgrounds and their peers from low-income families. Those who are well-off can fill in the blanks left by disjointed curriculum through parental guidance, outside tutoring and the rich experiences that are the hallmarks of privilege. But students whose parents work three jobs to make ends meet or who constantly face the threat of deportation don’t often go on weekend trips to museums, take family vacations to living history attractions or attend academic camps in the summer.

*The research on the inequities in school curriculum is staggering. An analysis conducted by the Education Trust recently found that a significant percentage of educators are not delivering rigorous content in math – and the problem is especially acute in schools with concentrations of poverty, where families aren’t able to supplement the lack of rigor.*⁶⁹

However, while quality curriculum is important, it is not enough. While stronger curricula make a real difference, that difference is magnified by matching it with professional development. Indeed, what research we have⁷⁰ suggests that over half of the possible impact of shifting to a stronger curriculum is lost if strong professional development is not part of the transition.

Yes, what we teach matters. This should not be surprising, but it should have profound implications for education policy. Other reports in this series will focus on how initial teacher education and ongoing teacher professional learning should interact with quality curriculum and will consider the implications for other key policy levers and the roles of school system leaders.

⁶⁴ Interview with Louisiana educator.

⁶⁵ In the context of the United States, this is typically no longer necessary given the wide and free availability of EdReports top rated curriculum. However, it is likely to be a necessary consideration for Australian systems reviewing the rigour of available curriculum for the first time.

⁶⁶ Chiefs for Change, 2017; Chiefs for Change, 2018.

⁶⁷ The Aspen Institute Education & Society Program, Chiefs for Change, Education Counsel, & Education First, 2018; Instruction Partners, 2018; The Council of the Great City Schools, 2017; Polikoff, 2018.

⁶⁸ edreports.org, 2018.

⁶⁹ Santelises, 2017.

⁷⁰ Taylor et al., 2015.

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