New Zealand Annual Review of Education (2022) 28: 62-77
DOI: https://doi.org/10.26686/nzaroe.v28.8278

What we can do to realise our excellence and equity goals in literacy

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The research, practice and policy communities in Aotearoa New Zealand know a lot about literacy; the what and how of development, and what works for whom, under what conditions. But two issues stand in the way of better meeting the national excellence and equity goals. One is solving system challenges of variability, scalability, sustainability and capability. Solving this requires taking a life course approach to the evidence, including what optimises enjoyment and criticality from early learning through schooling; and guaranteeing collective clarity and accountability for effective practices. Solving the second, too much selective and limited reasoning about what is needed, requires better understanding our histories of practice and outcomes, and the evidence about these; taking seriously the collective need for evidence-based reasoning; better understanding the nature of the sciences involved; and careful and collective reasoning to understand what is robust evidence and what is inaccurate and misleading. Both issues have implications for capability building through resourcing, initial teacher education, and professional learning and development.

Our research, practice and policy communities collectively know a lot about what it would take to meet the national goals for literacy of both excellence and equity[1]. Unfortunately, we are not good at building and sustaining the broad church required to make a substantial difference. Two issues get in our way. One is not being able to solve deep-seated system challenges of variability, scalability, sustainability and capability. The second is selective use of evidence and limited reasoning, often coupled with advocacy, opinion and critique of those not sharing the same position: a problem not limited to Aotearoa New Zealand (Thomas, 2022).

This paper addresses the two issues in the context of a life course view, although limited to early learning, and two phases in the primary years. It focuses on what is known about literacy activities that make a difference at these times and ends by reconsidering how to overcome the two issues.

Early learning

Our tamariki (children) arrive at school already markedly different in knowledge and skills relating to learning school forms of reading and writing (Thomas et al., 2019a). But we have consistent robust evidence for an activity that provides a powerful support for emergent literacy and language during the preschool years, which can reduce substantial disparities on entry to school. It is reading books with children. The primary issue that gets in the way of us making a substantial difference is inconsistency of use of the activity, rather than disagreements about the evidence.

[1] e.g., FULL-NELP-2020.pdf (education.govt.nz)

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The frequency and quality of reading books with children has predictable effects on a range of literacy and language outcomes (Dickinson et al., 2012; Reese et al., 2010). These include gains in vocabulary and other oral language skills, including phonological knowledge and phonemic awareness. This activity can be developmentally progressive in both family/whānau and early learning sites, and effective in different languages for different communities, crucially without undermining existing cultural practices with oral and written texts. Importantly, the activity can reduce disparities between groups by increasing 'literate cultural capital' (Chapman et al., 2018).

The effects of reading with children are replicable and generalisable, in many countries. In Aotearoa New Zealand reading to one's child at home, at least once a day, from age 9 months, is positively associated with 'flourishing' developmental status at 4.5 years, including 'school readiness' in literacy (Russell et al., 2022). Multiple studies by Reese and her colleagues have shown discourse features (e.g., high and low parental elaboration in language exchanges), and the focus of exchanges (on narrative features or decoding elements or both) contribute to emergent literacy skills, and progress in reading over the transition to school (Timperley et al., 2022).

National awareness should be strong. There have been national campaigns over many years referencing this activity (e.g., in 1999 'Feed the Mind' – see Turoa et al., 2002). The early learning curriculum (Ministry of Education, 2017) identifies expected outcomes including enjoyment of hearing stories, knowledge of print symbols and concepts, a large vocabulary and complex syntax, awareness of sounds in words, rhythm and rhyme, and recognition of some letters. Plunket/Whānau Āwhina recommends daily reading with advice about how to provide guidance (Home » Plunket). Other NGOs and not-for-profit groups have incorporated the advice in their work with parents and whānau going back more than three decades (e.g., HIPPY Programme | Great Potentials Foundation).

Despite all of this, the Education Review Office (Education Review Office, 2011) found the activity is variable across early learning settings, occurring with only some educators. They found 'inappropriate' use of worksheets and reliance on phonics programmes taking time away from what should be core language practices of telling and listening to stories and oral narratives. This means that, at a system level, early learning services are not contributing as much as they could to reducing inequitable outcomes. It also means the potential for supporting parents and whānau in their language and literacy practices is limited.

Like some other jurisdictions (e.g., Leech et al., 2022), 10% - 20% of parents of pre-schoolers read infrequently or not at all with their children (Thomas et al., 2019b). But analyses of the Growing Up in New Zealand (GUiNZ) cohort at 54 months showed that mothers who used teacher-led, centre-based services were 1.8 times more likely to read to their children frequently compared with mothers who used informal care once a day, irrespective of backgrounds. Descriptive and experimental studies show that parenting practices can be empowered in ways that add to, rather than undermine, existing cultural practices (McNaughton et al., 2009).

If we collectively know all of this and are now testing complex interrelationships with self-regulation (Reese et al., 2022), why can't we reduce the variability nationally? It is a scientific problem of system change, requiring several necessary, but in and of themselves not sufficient, factors to be in place. One is 'tighter' specification of the activity through the curriculum resources. Another is very explicit professional accountability, coupled with deep and extensive knowledge gained through Initial Teacher Education (ITE) and Professional Development and Learning (PLD). More evidence is needed about

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just how ITE and PLD can guarantee consistency in expertise, although greater clarity is emerging of how practice-based these need to be (e.g., Kraft et al., 2018).

Foundational years (Years 1-3)

We could do better in enabling all children to gain the foundational skills in reading and writing. There are systemic issues in the foundational years as well, but they are exacerbated by fractious opinions, unreasonable positions and misrepresentation of the evidence.

A recent national online panel on literacy (The Education Hub: 'What you need to know about the perilous state of literacy in Aotearoa New Zealand,' 21 March 2022) illustrates the latter issue. It descended into personal attacks, rather than rising to considered argumentation to find points of agreement. So much so, that the convener needed to send a letter to participants the next day urging more considerate collegiality:

> we were dismayed and deeply saddened by the nature of comments made by a minority of participants during the webinar, and the lack of respect they demonstrated towards other audience members and in particular the panelists. … much more work needs to be done [to] engage in constructive and consensus-building ways with those who hold ideas and perspectives that differ from our own. (Hood, 2022)

The problem came from a group advocating for a phonics programme. Their concerns in part draw on claims that a 'rigid constructivist approach' or 'ideology' (Tunmer & Chapman, 2015; Chapman et al., 2018), which evolved in the 1980s and 1990s, excluded the direct teaching of phonics, foregrounded guessing as a strategy for decoding, and replaced a more basic skills approach. In addition, the claim is that the national literacy strategy from 1999 entrenched this approach, resulting in reading levels dropping in international assessments while having no impact on our disparities based on ethnicity and SES. Moreover, we ignored the evidence from other systems, notably England, which changed to systematic phonics instruction and then had marked improvements in literacy outcomes.

What is the evidence for these claims? Sixty years ago in 1962, following trials of the 'Ready-to-Read' books (sometimes called natural language texts), the national handbook *Suggestions for Teaching Reading in Infant Classes* (Simpson, 1962) urged teachers to use meaning to drive instruction with judicious child-centred needs-based use of 'phonetic and structural' analysis during instruction. In 1962 there was strong advice not to use isolated teaching of sounds, rather to use the analysis to support a 'first guess' using the context provided by the natural language texts.

Teaching based on personalised instruction, focused on meaning and context, with an explicit reference to guessing, with phonics instruction as an adjunct, had been in place for at least 10 years when our 14-year-olds were assessed in the very first of the International Association for the Evaluation of Educational Achievement (IEA) studies of 15 countries (Thorndike, 1973). Our students then were in a small group of the highest performing countries in reading comprehension. There was a subsequent assessment (Elley, 1992) of 32 countries, 30 years after Simpson's 'suggestions.' It followed substantial updates of the national guidelines in 1971 and 1985 (Ministry of Education, 1985), and national in-service PLD (Slane, 1979) each of which further embedded the focus on meaning and use of context. The follow-up IEA study confirmed that our 9-year-olds, as well as 14-year-olds, were still in a small group of highest performing countries.

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Forty years after Simpson's 'suggestions', in 2001, the first of the now redesigned IEA assessments – i.e., The Progress in International Reading Literacy Study (PIRLS) – reconfirmed this excellence which, for good measure, was checked through a trend study using similar procedures to the 1991 study (Caygill & Chamberlain, 2005). The first of the OECD Programme for International Student Assessment (PISA) studies of 15-year-olds in 32 countries in 2000 independently confirmed our high levels (Ministry of Education, 2001).

What about England? Starting with the National Literacy Strategy in 1998, and amplified by the Rose Report in 2006, a marked intensification did occur in the use of phonics teaching, with synthetic phonics being the dominant approach to teaching foundational reading (Farquharson et al., 2022; Wyse & Bradbury, 2022).

The collective evidence just outlined indicates that parts of the claims are accurate, but others are inaccurate. For forty years we were high performing when explicit systematic phonics teaching was not prescribed and phonics instruction was an adjunct to being meaning based, and there was an early focus on guessing. England has not unequivocally reaped the benefits claimed for shifts to the intensive focus on phonics. The most general conclusion, after more than 20 years, is that the evidence is at best equivocal of impacts beyond initial standards, with two reviews claiming that there has been: (a) no change in the 'disadvantage gap' from early learning through to the end of secondary schooling; and (b) little if any sustained improvement in internationally benchmarked outcomes for those secondary school students who experienced this intensified teaching (Farquharson et al., 2022; Wyse & Bradbury, 2022).

Despite what the evidence shows about this early period when we were ranked highly, the general narrative, of falling levels, caused by not teaching phonics and ineffective strategies, driven by Ministry policy, and the ignoring of what other more aware countries have turned to, is repeated and amplified through think tanks (Lipson, 2020), advocacy groups (e.g., Blog — Lifting Literacy Aotearoa) and media (e.g., Reading Block: The war over teaching reading - structured literacy and phonics or whole language? - NZ Herald; Heather du Plessis-Allan: Why do we bother with reinventing the wheel sometimes? (newstalkzb.co.nz).

However, there is no disagreement that significant drops have occurred; the critical questions are when and in what areas and for whom? A significant drop is apparent if one compares 2000 PISA with now. But the major drop for 15-year-olds' reading comprehension occurred between 2009 to 2012 (it also occurred at a similar time in the assessments of mathematics and science). It occurred for 9-year-olds in PIRLS between 2011 and 2016. Crucially, it is as yet unclear why specifically in these years the major drops occurred. Hypotheses for what may have contributed, perhaps collectively include: the implementation of NCEA between 2002-2004; the rapid uptake of social media especially from 2009; the introduction of National Standards in 2010; the Tomorrow's Schools reforms accompanied by the phasing out of some advisory and specialist services; reductions in ITE time focused on literacy teaching; and increasing poverty levels (Elley, 2023; McNaughton, 2020). Complicating the explanations is that some other countries had similar drops at similar times, and also in mathematics and science (including Finland), with drops specifically by high performing students contributing to the overall drops in levels here and elsewhere.

We also agree we have an enduring equity problem. Over all these years of assessments there has been no significant impact on the achievement differences for Māori and Pasifika students and for students from low Socio Economic Status (SES)

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communities. This stark inability to change the equity profile, meant that starting in 1999 with the National Literacy Strategy and with increasing specificity, a change in advice occurred, among other things to more direct teaching of aspects of decoding. The 2003 Ministry of Education handbook *Effective literacy practice in years 1 to 4* (Thompson, 2003) now advised 'deliberate, focused instruction' to develop phonics because that 'underpins children's literacy learning' (p. 32), and phonemic awareness is 'fundamental' (p. 32). In the core instructional activity of 'guided reading,' teachers were urged to have a clear focus for sessions which could, for example, be on 'using word-level information to decode new words.' Now, the isolated teaching of sounds was encouraged, to examine word-level features, such as 'letter-sound relationships, spelling patterns, onset and rimes and new vocabulary,' and that was also advised for 'shared reading' (p. 99). The use of prediction as a processing strategy was supported, but there was no reference to guessing.

We don't know in any causal sense whether and how much this and other national resources contributed to changed practices and hence changed outcomes. But we do know two things. Firstly, the direct teaching of phonics has likely increased, rather than as claimed decreased. The reported use of commercial programmes increased from 2004 to 2018 to 51 different programmes (see Parr et al., 2004 and Cameron et al., 2019), and more than 90% of teachers say they teach phonics, most through explicit instruction of some sort (Chapman et al., 2018). However, teacher knowledge of the components of decoding, use of the evidence base about phonics instruction practices that actually work, and the preponderance of types of prompts that may still foster guessing, suggest considerable variability and ineffectiveness at scale (Chapman et al., 2018).

Secondly, we know that the changed focus was associated with an increased accuracy of decoding in representative cohorts of 9-year-olds. Following the first cycle of the National Education Monitoring Project (NEMP) in 1996, in which 19% of students were not reading accurately at expected levels, successive cohorts became increasingly accurate (decoding below expected levels dropped to below 10%) and disparities among groups reduced (see NEMP, 2000; 2004; 2008, 2010[2]). Notably, levels of comprehension did not change, nor did the inequitable patterns in comprehension achievement, a finding consistent with the international literature, that increasing decoding is not a sufficient condition to increase comprehension (Paris, 2005).

So, what would be an activity on which we could agree to focus that would make the most difference in these foundational years? We agree the point of learning to read is to comprehend, achieving multiple individual and collective meaningful purposes, including enjoyment. The seminal model of reading, the Simple View of Reading (Gough & Tunmer, 1986), claimed this depends on two bundles of skills, a decoding set and a language set, and as the later influential National Reading Panel report (Snow, et al. 1998) concluded, taught together in what they termed a 'balanced' reading programme. Newer models drawing on more recent evidence, add the role of motivation and purpose, together with social and emotional skills including self-regulation, as bidirectional influences with the skills (e.g., Duke & Cartwright, 2021). We don't do a good enough job of teaching many of these components well, not just phonics; for example, to optimise reading for pleasure (Boyask et al., 2022) and social and emotional skills (Johnston, P., 2023).

[2] NEMP - NZ's National Education Monitoring Project (otago.ac.nz)

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We agree that the differences in 'literate cultural capital' need to be addressed early and quickly. Apart from small advocacy groups, there is in fact agreement amongst local reading researchers that the evidence supports an integrated and needs-based approach from the beginning (for example):

> teaching of phonics and the development of effective word level skills and strategies in a systematic, explicit, and fully integrated manner into a rounded literacy instruction programme provides by far the best way. (Chapman & Tunmer, 2020; p. 5; see also Gillon et al., 2019; Jesson, 2022)

This general agreement also is apparent in the reviews by scientists in England (Brooks, 2022) and in the United States (Reinking et al., 2023). Armed with this agreement, one solution to the oppositional narratives is to collectively describe what foundational instruction should look like using terms that reflect the more nuanced evidence-based position. Simple binaries like 'whole language' or 'balanced' versus phonics are unhelpful now and can carry the wrong connotations. Our descriptors should capture what we need to optimise for writing as well as reading, and the inclusion of the early forms of being critical and digital literacy, as well as the social and emotional components. My candidates would not be 'rounded,' but more descriptively 'integrated' (as used above by Chapman and Tunmer, 2020; and Brooks, 2022) or 'comprehensive' (Reinking et al., 2023); driven by purpose and meanings that are significant to the learner.

If there was one activity to solve at scale for our excellence and equity goals it would be this challenge of effectively integrating components in meaning-based reading, having them mutually supportive and with instruction which was responsive to the varied component profiles of ākonga (learners) as they progress. Thankfully, there are two promising research and development programmes underway that may provide further good evidence for how to get integrated teaching right in the first weeks and how to build on that across the first year. These are The Better Start Literacy Approach (Gillon et al., 2019) and Early Literacy Support (Jesson, 2022). They have the potential to show us how instructional practices, designed from different theoretical bases, nevertheless can be compatible and synergistic, providing a focus on a comprehensive approach which integrates complex components when learning, including self-regulation.

There is still the systemic problem of variability which requires solutions like that proposed above for reading to children in the early years. We would need much clearer expectations for the use of powerful integrated practices. Given the varied assessments currently used in the early years (Arrow et al., 2022; Cameron et al., 2019) and the current littered landscape of opinion, there needs to be greater shared understanding of what it means to have a comprehensive integrated approach. This in turn will require explicit professional accountability. ITE and PLD are key too, including building system capability to identify what is believable and accurate and separable from the morass of opinion, misrepresentation and misinformation.

But there is more to solve than just integrated approaches based on a complex view of reading. It requires acting on our evidence about expectations, about cultural responsiveness (Gillon et al., 2019) and the evidence that familiarity with Te Ao Māori and mātauranga Māori adds power to the pedagogy for Māori ākonga (e.g., Mhuru, 2020). It is naive in the extreme to think a system that has struggled with systemic racism can, by the adoption of instructional techniques alone, make a difference to equity. Considerable specialist expertise is required to provide the integrated and comprehensive pedagogy, flexibly applied on a needs basis, in ways that respect language, identity and culture.

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Middle and upper primary years

If there is one major message from many years of research it is that getting the foundational years right is necessary, but not sufficient to guaranteeing further high progress and achievement. The big issues for solving literacy challenges in the middle and upper primary years are again two-fold. Our system is too variable and inconsistent in meeting the excellence and equity goals in these years. But again, there are barriers to a collective evidence-informed approach.

As with other jurisdictions, there is some evidence for a slowing down of progress in reading comprehension and in writing against curriculum expectations in years 4-8 (Hattie, 2007; Ministry of Education, 2018). It is not so apparent in our cross-sectional National Monitoring Study of Student Achievement (NMSSA) data, but is apparent in the national database for e-asTTle reading using both cohort data and year-on-year data (Ministry of Education, 2018). Average writing achievement is lower than expected across year levels, and lower at Year 8 than reading; and databases consistently show progress slows down (National Monitoring Study of Student Achievement, 2013; Ministry of Education, 2018).

The disparities in English reading comprehension between Māori and Pasifika students and those from low-decile schools with others, at both Year 4 and Year 8, are starkly present in all of the NMSSA, NEMP, and Assessment for Teaching and Learning tool (e-asTTle) databases. They are of the order of 1.5 years difference. In addition, they show, for both reading and writing achievement, that there is a large spread in achievement across year levels with marked variability across regions, schools and even within schools. There are, for example, low decile schools that are outliers with higher overall rates of progress and achievement than many high decile schools.

It is likely that limitations in students' generic and subject-specific literacy skills are present (see McNaughton, 2020), attributable to aspects of instruction. In their recent synthesis of reading comprehension in Year 4 to Year 8, Wilson et al. (2022) claim that very high levels of teacher expertise are required for better instructional designs which provide:

> [increased] opportunities to read a wide variety of texts (digital, print, narrative, literary, expository) for a wide variety of purposes (enjoyment, literary appreciation, content learning in subjects) and to learn about those texts and about comprehension in the context of purposeful engagement with those texts. (Wilson et al., 2022. p. 6)

Similar concerns about opportunities, intention, motivation and learning can be made for writing (National Monitoring Study of Student Achievement, 2013; 2020). A major problem to solve is how to guarantee all students frequently have 'purposeful engagement' with a wide diet of texts within and across subjects, inside and out of school. For example, Year 8 students in NMSSA (National Monitoring Study of Student Achievement, 2015) report one to two hours reading a week, but there are large ethnicity and gender differences in reading outside of school and these are associated with large achievement differences. Boyask et al. (2022) add that around half of the 8-year-old GUiNZ cohort report enjoying reading a lot, and around three quarters read frequently (more than once a week). But again, the odds are twice as high for Māori and Pasifika children compared with Pākeha children of being in the groups either not enjoying reading

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or not reading frequently. They are also over-represented in a group of children who greatly enjoyed reading, but didn't read (26% were Māori and 25% Pasifika).

One part to solving this equity challenge with text engagement is to address the motivational issue based on cultural and language relevance. Our ākonga report low opportunities for reading books that reflect their social and cultural identities (National Monitoring Study of Student Achievement, 2015) and for writing about things that are personally important (National Monitoring Study of Student Achievement, 2020).

Like the foundational years there is some cause for optimism, despite many research gaps. Personal and collective meaning are central to literacy development, increasingly through the middle primary years of schooling and there is a programme of research focused on how to support reading for pleasure (Boyask, 2022). Research programmes are testing promising interventions at scale. Wilson and Jesson's (2019) 'T shaped' literacy programme has evidence for how to increase dosage and diet that makes a difference to English reading achievement, specifically in schools serving Māori and Pasifka students from communities with fewer material resources.

As in the foundational years, oppositional stances and forced dichotomies do not help. A recent criticism of our educational practices applied to literacy, contrasts a knowledge-rich focus with a child-centred focus and claims the latter has 'ruined a once world leading school system' and hence is the reason for our declining literacy (Lipson, 2020). The child-centred focus, it is claimed, has led to problems such as differentiating instruction to suit individual learners, and placing more control over what is learned in the hands of the learner.

Appeals to 'cognitive science' are used by Lipson (2020) to justify a singular focus on content, and a rejection of learner agency and differentiated instruction. But we know that very effective instruction depends on having a detailed and comprehensive understanding of a learner's strengths and needs, and teaching to these (Puzio et al., 2020). Furthermore, self-regulation and self-efficacy affect learning and achievement and, reciprocally, learning success affects these over these years (e.g., Duckworth et al., 2014). Despite recent opinion pieces that these social and emotional skills including 'relating to others' are a 'distraction' and 'don't need to be taught' (Johnston, M., 2023), they can and desperately do need to be taught to contribute to our excellence and equity goals (Johnston, P., 2023).

Apart from the opinion pieces, we can agree that content knowledge and having a focus on the learner are both important. They are not mutually exclusive or even along the same psychological dimensions, and need to be integrated consistently. The literacy challenge and proposed solutions suggest that, like the foundational years, specialist teaching is needed. There are different models for how we might achieve more specialist teaching. It is beyond the limits of this paper to review these models, but we know we need to test models that are purpose built and specific to our contexts to avoid the risks of inappropriate designs (e.g., Fryer, 2018).

A Proposal for Productive discourse

The variability and inconsistency issue is a complex scientific problem requiring much greater appreciation of how to scale what works through local adaptations (Raudenbush, 2020). Greater consistency relies on such system features as detailed shared understanding of developmental progressions and expected patterns, greater collective expertise and efficacy to enable evidence informed practices systematically applied, as well as increased capability to create the local curriculum (a form of instructional design

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expertise). It requires a much better funded and targeted research, science and innovation strategy for education than is currently present, and we are the poor cousins of others in this respect (Ministry of Business, Innovation & Employment, 2022).

Solving our non-productive oppositional thinking is equally a complex scientific problem. The argument here is not to curtail reasoned scientific discourse, but to increase it, not only for collective impact, but also for trust in science and longer term societal cohesion (Gluckman et al., 2021; Sibley, et al., 2020).

Evidence about how our research, practice and policy communities could solve this second issue comes from a variety of sources. One is interventions that reduce polarisation. A common experimental approach is based on collaborative dialogue and includes inquiring about others' viewpoints, avoiding moralising language, signalling receptiveness to opposing views and explicitly shifting away from persuasion towards understanding (Hartman et al., 2022). Other sources are studies of argumentation and collaborative reasoning among both children and adults (e.g., Kuhn et al., 2016).

These dialogue forms require both perspective taking and critical thinking. Perspective taking is an open-mindedness to alternatives, and entails aspects of cognitive and emotional empathy; while critical thinking inherently involves analysing and evaluating multiple perspectives on a complex issue. They are hard work even for adults (Kuhn et al., 2016). The most difficult parts are acknowledging the benefits of another's perspective or challenging the flaws or weaknesses in one's own perspective, self-reflection, and being able to overcome the pervasiveness of both negative and positive confirmation biases in our motivated reasoning (Kahne & Bowyer, 2018). The skills and dispositions are increasingly necessary in a digital world in which there is ubiquitous and extensive access to 'polluted' information (Philips & Milner, 2021), increased susceptibility to the insularity of opinions and viewpoints, and an increased need to consider and respond positively to others (Breakstone et al., 2021).

In addition to these enablers, we need to identify what constrains high level argumentation. Panels which are set up as oppositional are not helpful, as the recent Education Hub experience showed. Opinion pieces which are written solely to critique 'the other side' are not helpful. They often misrepresent positions, set up straw persons, selectively use evidence, and repeat misinformation. A recent example is the set of America Public Media podcasts (https://features.apmreports.org/sold-a-story/) blaming the parlous state of literacy achievement in the United States on Marie Clay (and just two others) repeating misinformation about, misrepresenting, and denigrating Marie Clay's science. One of many examples is a claim that she 'did not believe in phonics instruction.' Even a cursory knowledge of her writings on reading and writing, or actually knowing the design features of Reading Recovery, would reveal that claim to be just simply wrong.

What is helpful is careful and collective reasoning which enables understanding of what is well established, what is robust and what is inaccurate and misleading. We need to have professional standards for how we engage in public discourse and be prepared to do the hard collaborative work of evidence-informed reasoning. Not doing this runs the risks of not solving our excellence and equity challenges and undermining the trust in good science.

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