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Educational reform in Singapore: from quantity to quality

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Abstract In 2004, Prime Minister Lee called teachers to "teach less" so that students might "learn more". In 2005, the Ministry of Education clarified this philosophical statement to mean transforming learning from quantity to quality—"more quality and less quantity" in education. This is in line with the national vision of 'Thinking Schools, Learning Nation'. This policy initiative, which began in 2004, is set to change the fundamental nature of education in Singapore. This article discusses this initiative, its major implications for schools in Singapore and the challenges to be addressed in the implementation of the policy. In particular, the article discusses the issues of understanding an engaged learning paradigm, establishing signposts for the shift from quantity to quality and the difficulties of system-wide transformation. The challenge for schools is to go beyond the form of the initiative to bring real, substantial and sustainable educational change through this movement.

Keywords Reform · School · Teach · Learn · Quality · Leadership · Teacher · Student

Introduction: teach less learn more

Singapore Prime Minister Lee Hsien Loong's speech during the 2004 National Day Rally carried this quote, which is now much talked about in this country: "We have got to teach less to our students so that they will learn more" (Lee 2004). This catchy and somewhat paradoxical quote 'teach less, learn more' is now a catch-phrase in the Singapore Education System. It signals yet another major policy initiative in the Singapore education system.

It is good at this point to explain briefly, the background leading to this idea of "teach less and learn more" (see for example Ng 2005a,b). A major milestone in recent education reforms in Singapore is the "Thinking Schools, Learning Nation" (TSLN) vision that provides direction to the transformation in the education system since 1997. Senior Minister Goh

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Chok Tong, then Prime Minister, explained that it was a vision for a total learning environment, including students, teachers, parents, workers, companies, community organisations and the government (Goh 1997). Thinking Schools is a vision of a school system that can develop creative thinking skills, lifelong learning passion and nationalistic commitment in the young. Learning Nation is a vision of learning as a national culture, where creativity and innovation flourishes at every level of the society.

Under the umbrella vision of TSLN, various initiatives were launched, each addressing a different aspect of the education system. The more significant ones were the adoption of an ability-driven paradigm to replace the previous efficiency-driven paradigm. The new paradigm aims to tailor education according to the abilities of the student. National Education (NE), launched in 1997, aims to develop national cohesion, the instinct for survival and confidence in the future by fostering a sense of identity, pride and self-respect as Singaporeans. Syllabi, examinations and university admission criteria were changed to encourage thinking out of the box and risk-taking. Students are now more engaged in project work and higher-order thinking questions to encourage creativity independent and inter-dependent learning. Singapore's Masterplan for IT in Education, launched in 1997, lays out a comprehensive strategy for creating an IT-based teaching and learning environment in every school, so that every student becomes literate in IT skills by the time they leave school (Ng 2005a). In 2004, the focus of TSLN shifted to 'Innovation and Enterprise' (I&E). I&E aims to develop intellectual curiosity among the students and a spirit of collective initiative (Tharman 2004a; Ng 2005b).

In 2005, in response to the Prime Minister's call on the teachers to "teach less, so that our students could learn more" (Lee 2004), the MOE launched the initiative "Teach Less, Learn More" (TLLM). But what does "teach less, learn more" mean? This article now discusses the TLLM initiative and the major implications and challenges for the Singapore education system.

The policy intent: from quantity to quality

According to the Minister of Education, Mr Tharman Shanmugaratnam, TLLM is the way that education in Singapore is to go forward and it is about transforming learning from quantity to quality. Replying to questions in Parliament about the TLLM initiative, Minister Tharman (2005a) said that:

> Our basic approach, as we go forward, is to go for more quality and less quantity. We will focus on the quality of learning, quality of CCA and community engagements and the quality of the whole school experience that the student goes through. We will seek to cut back on quantity, careful and calculated cuts, so as to provide more "white space" in the curriculum, space which gives schools and teachers the room to introduce their own programmes, to inject more quality into teaching, to reflect more, to have more time for preparing lessons and to give students themselves the room to exercise initiative and to shape their own learning.

This transformation of learning from quantity to quality, summed up in TLLM, aims "to touch the hearts and engage the minds of our learners. It reaches into the core of education—why we teach, what we teach and how we teach" (Tharman 2005b). This is an interesting statement from the minister. The Singapore government has always been making changes in the education system, from school admission criteria to the introduction of IT in education. It has achieved many enviable results, especially in the area of Mathematics and Science, as

evidenced by the Trends in International Mathematics and Science Study (TIMSS) results (Tharman 2005c). The Singapore education system has been known for its high resource commitment, academic rigour, down-to-earth direct teaching by the teachers and repeated practice by the students. However, despite the 'success', the minister has acknowledged that while the system has achieved 'quantity', the students may not be adequately engaged in the learning process. They become passive learners, driven externally to perform but not necessarily inspired. The 'quality' breakthrough therefore has two key aspects:

- The teachers have to review the core of education—the 'why', 'what' and 'how' of teaching;
- The students have to become engaged learners—interested and proactive agents in the learning process.

Tharman (2005b) further elaborated that under the TLLM paradigm, there will be "less dependence on rote learning, repetitive tests and a 'one size fits all' type of instruction, and more on engaged learning, discovery through experiences, differentiated teaching, the learning of life-long skills, and the building of character through innovative and effective teaching approaches and strategies." Moreover, more opportunities will be created for "holistic learning so that students can go beyond narrowly defined academic excellence to develop the attributes, mindsets, character and values for future success".

To give a more concrete picture of TLLM, Prime Minister Lee (2006) gave an example:

> We have talked about 'Teach Less, Learn More' for quite some time. I think it is happening in many schools. I just give you one example of what it means. This is a school from Bedok—it is Bedok South Secondary School. The things which they are doing, learning through projects—designing and making movies and posters for the Singapore Heart Foundation, designing gadgets, handphone charger and pencil holder using IT, Computer Aided Design. Having prototype machines and making the things which they are designing. What subject is it? It is not one subject. It is a combined learning—Art, Music, Design and Technology, Food and Nutrition, all put together applied and through applying, you learn.

Building on the previous initiatives under the TSLN vision, such as the mindset changes encouraged under I&E, TLLM continues the TSLN journey by focusing on improving the quality of interaction between teachers and students, so that the students can be more engaged in learning and better achieve the desired outcomes of education (Wee 1998). In other words, TLLM advocates pedagogical advancement and innovation in the teaching and learning process so that the education system may achieve a transformation from quantity to quality.

Although the policy was officially launched only in 2005, TLLM is more a gradual shift since the inception of TSLN rather than a one-time sudden move. An example of how Singapore tries to shift towards a TLLM paradigm is the introduction of Project Work in 2000 for students to learn group work, knowledge application and transference (for more information on Project Work, read for example Ho et al. 2004). According to the Ministry of Education (MOE), project work is "an integrated learning experience that encourages students to break away from the compartmentalization of the different disciplines. It aims to provide students with opportunities to explore the inter-relationships and inter-connectedness of subject-specific knowledge." (Ministry of Education, 2005a) The MOE defines four domains of learning outcomes, which the Project Work is meant to help students develop (Ministry of Education 2005a):

- Knowledge Application—Students are to learn basic research skills, apply and transfer knowledge and skills learnt across disciplines and to make connections between them.

- Communication—Students are to improve their ability to communicate ideas clearly and effectively in both written and oral modes.
- Collaboration—Students are to develop and improve social skills in collaborating with others towards a common goal (students usually work in groups of 4–5).
- Independent learning—Students are to learn to take charge of and monitor their own learning as well as to develop a positive attitude and responsibility towards their work.

Project work is more emphasised in the secondary and upper secondary schools. In the primary schools, the MOE also launched the Strategies for Effective Engagement and Development (SEED) initiative, which calls for teachers to develop better strategies to engage pupils in the early primary years. It helps the primary schools better enhance their foundation-year teaching programmes, pedagogy and assessment approaches (Ministry of Education 2005b). Minister Tharman (2005b) gave an example of how one primary school made use of the flexibility offered by SEED to engage their students by reworking the curriculum:

> The teachers (of Rulang Primary School) got together and thought hard about how to provide a vibrant learning environment for Primary 1 pupils. They took the curriculum, and reorganised along lines that would appeal to students and better engage them in learning. They created activities that could arouse the interest of their young students, and brought the learning of language and process skills into a context that students found relevant and enjoyable.

To support such pedagogical transformation, the MOE has committed substantial structural and resource support. For example, in terms of structural changes, it will provide greater space for school-based flexibility in the curriculum by reducing content. There "will be judicious content reduction across subjects so that 10–20% of curriculum time can be freed up as 'white space'. Teachers will have the autonomy to use the 'white space' provided to customise lessons, using a variety of teaching and assessment methods to better meet the needs of their students." (Ministry of Education 2005c) The MOE will also "free up an average of 2 hours per week for each teacher by 2010 for professional planning and collaboration", by providing "1 hour 'timetabled' time per week for teachers to reflect, discuss and plan their lessons; and recruit Co-Curricular Programme Executives, which will free up on average, another 1 hour of teacher's time weekly." (Ministry of Education 2005c) The MOE will also "offload experienced teachers, such as Senior Teachers or Heads of Department, to mentor beginning teachers". (Ministry of Education 2005c)

In terms of resource support, the MOE has, for example, set aside some Singapore $40 million to allow schools to ensure that the school infrastructure is sufficiently flexible to support teaching approaches to better engage students in learning. Called the Flexible School Infrastructure (FlexSI) initiative, schools can change their infrastructure, such as modular classroom that can be opened up for larger group lectures, or partitioned to become smaller areas for small group discussions, an eco-street for the sciences and even an outdoor amphitheatre for the performing arts, to allow interactive, experiential, independent and hands-on learning (Ministry of Education 2005d). Such is the scale of the support to achieve engagement in student learning.

From quantity to quality: the implications and challenges

Teachers in Singapore are already very busy with daily teaching and students are similarly busy with daily studying. The system can continue in its current form and still deliver results.

TLLM thus offers educators in Singapore a great challenge because the substance of the transformation is subtle rather than overt, fundamental rather than superficial. This article now discusses a few of these subtle implications and challenges.

Engaged learning among students

Teachers and school leaders have to realise that engaged learning in TLLM does not simply refer to higher attention by students to their teachers, while doing the same drill and practice. To achieve a real transformation from quantity to quality, teachers and students have to realise that engaged learning is a very different learning paradigm.

At the basic level, an engaged learner is one whose whole being is intensely consumed by a learning task. The person's attention, energy and intellect are all directed towards the object of learning. Intuitively, the quality of learning increases with such an intense level of engagement. However, more importantly, in the engaged learning paradigm, the learners are the proactive agents in the learning process, facilitated by their teachers, as opposed to the traditional models of teaching and learning, where teachers provide information for students to memorise and regurgitate, while students participate passively in the learning process. According to Jones et al. (1994), engaged learning involves the following four elements:

- The learners are responsible for their own learning. They take charge of their learning and are self-regulated. They define learning goals and tackle issues that are meaningful to them. They know how the learning activities they undertake relate to the goals. They develop their own standards of excellence.
- The learners are strategic in their learning process. They know how to learn, develop and refine their learning. They can apply and transfer the knowledge generated creatively.
- The learners collaborate with others. They understand that learning is social. They recognise that different people can have different views about the same issue and the multiple points of view can enrich the learning process.
- The learners are energised throughout the learning process. They derive excitement and pleasure from learning. They find learning fulfilling.

Therefore, engaged learning entails intrinsically motivated involvement of integrated cognitive processes: creating, problem-solving, reasoning, decision-making and evaluation (Kearsley and Shneiderman 1998). It is a mobilisation of cognitive, affective and motivational strategies for learning (Bangert-Drowns and Pyke 2001). Learners may be involved in a wide variety of learning activities such as dialogue, brainstorming, categorising, debriefing, problem solving and even peer teaching, under the flag of various pedagogical modes such as collaborative learning, problem-based learning and project work.

Given that engaged learning is about empowering learners in the learning process so that there is active and proactive involvement on the part of the learners, then the role of teachers is also different. Teachers of engaged learning are designers of learning opportunities. They create a learning environment where students work collaboratively to solve problems, do authentic tasks and construct their own meaning. They are co-learners with their students, instead of providers of solutions.

To transform an education system from a focus on quantity to a focus on quality requires a certain degree of 'maturity' in the students in 'taking ownership' of their learning and the teachers 'letting go' of their results. This is not merely a change in education policy but a fundamental change of teacher and student identity and disposition. This is easier said than done in an environment where results still rule. Many teachers and students are still driven

to perform in examinations. Students still find learning stressful rather than pleasurable (Ng 2005a). Therefore, while students may lament that the system does not allow them to 'think', under the stressful situation, many may actually prefer to be spoon-fed with model solutions then to look for solutions themselves. As Ng (2005a) wrote:

> To the students, regardless what the rhetoric may be about creativity, in the mean time, mugging for examinations will still bear more material fruits than spending time in exploratory work, since at the end of the day, it is the examination that counts. More efforts and attention will still be channelled in that direction, instead of exploration and experimentation.

Therefore, engaged learning is a mental disposition that has to be nurtured through the entire student life of the young learners. Philosophically, under this paradigm, a student who can get a distinction in a subject but who does not appreciate the content or the learning process would mean that the education system has failed, at least for this student. On the other hand, a student who leaves the education system with a passion for learning more and learning continuously would mean that the education system has succeeded for him.

The signposts for quantity to quality

According to the MOE, TLLM means less dependence on rote learning, repetitive tests and a 'one size fits all' type of instruction, and more on engaged learning through experiential discovery, differentiated teaching, the learning of life-long skills, and the building of character through innovative and effective teaching approaches and strategies. But how does one tell whether education has moved from 'quantity' to 'quality'? This is a tricky issue because the provision of new programmes and structures, while necessary, does not guarantee progress from quantity to quality in the nature of education itself. For example, Project Work appears to be well aligned to the TLLM effort and is a great platform for TLLM to be practised. However, it is also possible that despite well-meaning rhetoric, students are busy with project work activities without achieving the stated aims. Worse, they may feel pressurised to 'cook up' something creative (Ng 2005a). The students are doing new learning with old learning methods. Teachers are facilitating new learning with old pedagogies. The traditional understanding of teaching and learning has not changed.

Quality assurance in education, in the form of excellence models and external validations and inspections, is well established in Singapore (Ng 2003a). However, as it stands, in responding to the stipulations of such quality models, there is pressure to look for quantifiable performance indicators, which may or may not pick out the subtle nuances of quality change. Therefore, the suggestion here is for educators to look for a set of 'signposts' for quality, that serve as a guide for schools in their development, so they can gauge their general state of progress along their journey and give an indication that the school is on track. What are these 'signposts'? Adapted partially from Costa's (2004) epistemological 'mind-shifts', the idea is to examine whether the teaching and learning processes indeed reflect a change in fundamental ideas on epistemology in the following areas:

- *Construction of knowledge (not just transmission of knowledge)*: in the new teaching and learning processes, students are able to develop their own knowledge base, pulling information from many sources and making linkages, instead of waiting for the teachers to push information to them.

- *Understanding (not just memory)*: students know what they are doing rather than just memorising facts or applying methodologies that do not make sense to them.
- *Pedagogy (not just activity)*: in the new TLLM paradigm, teachers do not merely carry out activities for the sake of having activities, but each activity is a part of a well thought-through pedagogy that will bring students to a higher level of understanding or appreciation.
- *Social constructivism (not just individual study)*: learning goes beyond an individualistic pursuit of 'my grade'. It is a social interactive process rather than an individual one. The social orientations of constructivism, commonly linked to Vygotsky (1978), emphasise the cultural and social context in which learning takes place. Knowledge is not something people possess somewhere in their heads, but rather, something people do together (Gergen 1985).
- *Self-directed learning (not just teacher-directed)*: students develop an increasing sense of self-directed-ness in their studies, instead of being driven by their teachers to perform. They are also more involved in planning their own progress, instead of simply plodding along a teacher-planned or system-planned route.
- *Formative assessment and self assessment (not just summative grades)*: the new learning process involves constant feedback for continued learning, rather than just grades after an examination. Moreover, students learn how to assess their own progress and take necessary steps to enhance their learning process.
- *Learning about learning (not just learning about subject)*: students learn how to learn better, rather than just learn the content about a subject area. This involves learning how to find relevant information, link up ideas from different knowledge bases and work with others in a learning group. This also involves, beyond the acquisition of knowledge, the development of good habits of mind (Costa and Kallick 2000), so that students may have the mental agility in their working lives to address any issues that come their way.

Having discussed the need for an epistemological shift in the teaching and learning processes, caution is needed as well so that the pendulum will not swing too much over to the other side. There ought to be a good balance of content and thinking skills. The danger is to engage the students in all sorts of 'fun' activities under the guise of TLLM without content or pedagogical consideration. Students may not learn anything very much from the activities and pick up too little on reading, writing and arithmetic.

So the big question remains as to where the balance point is. On the one hand, the current content is crammed with facts, definitions, formulae and other 'embellishments'. On the other hand, trimming content does not mean that textbooks, notes or other sources of information in the classroom should be just nothing more than skimpy outlines. On the one hand, the current system drills the student and 'repetitive practice' stifles creativity. On the other hand, learning also requires frequent practice—try getting a driving license and not driving for the next 10 years. So, drills are not necessarily bad things. So where-in lies the balance?

Therefore, the challenge is to make balanced choices: knowledge versus learning skills, teacher-centred versus student-centred instruction, depth versus breadth in curriculum, individual excellence versus collective learning, and student accountability versus student autonomy. Of course, it will be good to be able to achieve both ends of each continuum. However, the more likely scenario is a continuous calibration along the journey of change. The important thing is to keep in mind the central thesis of 'less is more'—students learn more when teachers teach less but teach it well (Dempster 1993). Educators should focus on essential content and thinking skills, while enhancing pedagogical quality, so as to retain a robust education and not throw the baby out with the bath water.

Achieving system-wide transformation

TLLM is in its essence a shift in epistemological beliefs, leading to changes in pedagogical practices. While isolated examples and case studies can be easily found, to achieve a system-wide transformation is a tremendous challenge.

Firstly, many pedagogical reform and development projects premise themselves on an assumption about the way in which teaching and learning practices are influenced. The assumption is that good curriculum and teaching practices are self-evident and self-explanatory and teachers can implement them easily and 'with some briefing or training'. Once the 'clearly superior' ideas embodied in the new curricula are 'cascaded' to the teachers, they will simply switch from traditional teaching to the new processes and change life-long habits in order to improve their teaching.

But changing pedagogy is a highly complex process. It is personal to the teacher and teachers are themselves products of a past era. Teachers' beliefs are influenced by their experiences as learners (Grant 1996). This generation of teachers has been educated and trained through a system with beliefs markedly different from those now espoused.

So while the new pedagogical ideas can be engaging, sophisticated and powerful, and teachers find 'support' through the provision of tangible materials and 'training workshops', quality teaching practices are systemically practised in only a few schools or classrooms. There are many individual, departmental and school factors that need to be addressed before such subtle quality can be achieved system-wide. The more subtle the breakthrough, the more it requires an art rather than a science. That means teachers will have to grapple with the art itself, rather than to implement a policy in a compliant manner.

TLLM involves deliberations not just of teaching and learning, but of examinations, pedagogical skills and entrenched culture. Currently, there are weak incentives for teachers to change their practices in their daily work routines. But there can be high costs of making large-scale, long-standing changes of a fundamental kind. Why should a teacher use two hours to allow students discover a concept for themselves when he can use one hour to teach it and another hour to drill the students to practice-perfection, especially when it is likely that the examinations will test the latter than the formal? Therefore, Minister of State for Education Lui (2007) said:

> We can do more to reach out to more teachers and to give them the necessary support. It is a worthwhile investment if it results in our classroom and schools becoming a more stimulating environment and our children more engaged and self-directed learners. In order to move further down this path we need to understand better what the impediments are that prevents our teachers from becoming even more active creators of new practices.

Therefore, one challenge is to 'win over' the teachers. Without the effort of the teachers, TLLM is unlikely to bear fruit. Prime Minister Lee (2006) pointed out that "it takes a lot from the teachers and we should recognise the efforts of the teachers who are able to make this happen."

However, teachers' understanding and ownership of TLLM is insufficient. School leaders have to provide a platform for teachers to engage in innovation and experimentation in teaching. Teaching needs to be in itself an exercise in creativity to discover new ways to spark off questioning in the classroom, or to excite students to explore or think through issues for themselves. Leadership in schools will have to move towards curriculum and instructional leadership, practised in a distributed mode, rather than administrative leadership. All supporting systems and structures will have to help schools focus on the teaching and learning

process. Headquarter and school leadership have to "introduce steps and initiatives that will help teachers make that important transition from 'implementer' to 'developer"' (Lui 2007).

But in this area, the worst enemy of progress and reform may be success itself. Why 'teach less' when 'teach more' brings so much examination success? The education system is an open system that is deeply influenced by the wider societal culture and vice versa. More quality and less quantity in schools will have to take into account the fact that many parents have been used to a quantitative measure of academic success. For a long time, a successful student has been one with good academic results. They take many subjects and are able to score distinctions in all of them (Ng 2003b). Therefore, the examination performance oriented psyche poses a challenge to school leaders and teachers to innovate in their 'core businesses'. Principals cannot afford to stray too far, so long as they are held accountable for their schools' performance in the national examinations (Tan 2003, p. 40):

> Amid this climate of risk-averse behaviour, what then are the prospects of wide-ranging and sustained change, as far as the teaching of critical and creative thinking skills, the incorporation of information technology into teaching and learning, and the promotion of project work as a form of assessment?

The issue is not whether these initiatives are implemented. The challenge is whether the initiatives delve deep beyond the surface level to change the basic philosophy and approach to education. School leaders are thus very important. They will have to give the direction and empower the teachers. Tharman (2004b) said:

> Ultimately, the quality of education is decided on the ground. It is shaped by thoughtful school leaders, whom teachers trust to lead them in the midst of change. Teachers must have leaders—principals—who inspire teams, and give them ownership over their teaching.

The challenge for school leaders is to chart the direction and craft the strategy amidst intense school competition and fast pace change. Structural changes from the MOE are insufficient to bring about mindset changes. The MOE has attempted to cut class size and employ more teachers to allow better teacher–student interaction (Tharman 2005b). But to really achieve a leap in the quality of teaching and learning, Prime Minister Lee cautioned:

> I think that there are a lot we can do, and which we will do. But there is one thing which we shouldn't do and that is when we add more teachers, we better don't add more homework or increase the syllabus because that just defeats the whole purpose. Then we are back to square one. In fact, I think we should cut down on some of this syllabus. It would mean less pressure on the kids, a bit less rote learning, more space for them to explore and discover their talents and also more space for the teachers to think, to reflect, to find ways to bring out the best in their students and to deliver quality results. (Lee 2004)

Conclusion

In a way, the case of Singapore is somewhat reflective of the recent educational reforms in other East Asian education systems. As Zhao (2005) wrote:

> They (Chinese Taipei, Hong Kong, Japan, Korea, and Singapore) seemed eager to abandon what the rest of the world, particularly the United States, would love to have: a rigorous, coherent, systematic math and science curriculum instead of inquiry-based,

> constructivism-driven, child-centred, progressive math and science education, which many American educators now seem similarly eager to throw away.

Of course, these countries are looking for ways to address their own problems, such as their students' lack of creativity, focus on memorization over application, a disconnection between school learning and real-life situations, and stressed students. But essentially, what the East Asian reformers wanted for their future was America's past and present, and vice-versa. Therefore, in any education reform, there must be industry tempered with caution. As Zhao (2005) noted:

> First, we tend to throw the baby out with the bath water. In an attempt to learn from others, we forget that what we have achieved is still worthwhile. Thus we abandon our own strengths. Second, we tend to focus on only the good part of others' achievements and discount the negative. Third, we tend to ignore the conditions that enable the achievement of the others, focusing only on borrowing the mechanisms without considering the cultural, social, and systemic contexts that make these mechanisms effective. Fourth, we tend to look at each strategy and practice in isolation, ignoring the possibility that they may have to interact with one another to produce the desired effects. Finally, because we must examine other nations' experiences from our own perspectives, we are inevitably given to misinterpretations.

Many educational systems have failed in their large-scale centralised reform attempts in affecting the actual learning of students (Fullan 2000). Can Singapore prove otherwise in its TLLM reform? This remains to be seen. While policy changes may have the right intentions, to really affect the core of learning in schools, changes need to go beyond the system-level structures and provisions to address deep and subtle issues. Otherwise, the implementation of an engaged learning paradigm, the shift from quantity to quality and the achievement of system-wide transformation will prove to be elusive goals.

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