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The Measures of Quality Teaching and Quality Teachers

Summary

This issue of the Digest looks at the concept of 'Teacher Quality'. There is some difficulty in clearly defining what is meant by 'Teacher Quality' and, as a result, the best approach currently may be to depend on a variety of measures to ascertain whether it is present. Following Naylor and Sayed (2014), three possible measures are suggested, each with its advantages and drawbacks. These are classroom observations, teacher formal qualifications and student outcomes. This issue looks at the advantages and problems related to each. Classroom observations are closest to seeing what the teacher does but generally they just provide a snapshot of what is being done and they can be disruptive. Moreover, to reduce subjectivity, it is important that what is being considered is defined as clearly as possible and this issue looks at some of the features of good teaching that have been suggested. The second measure, teacher qualifications, on the other hand, has the problem that, while having a well-qualified teacher team correlates with the success of education systems, it is not guaranteed that an individual with high academic qualifications will be a successful teacher. Student outcomes, the third measure, are really the focus of any education system. However, national and international tests, which are the most common measurement instruments of student outcomes, have been criticized for being too narrowly focused. This issue looks mainly at teacher quality in general although some sections look more closely at English Language teaching. Future issues in this volume will look at applying these ideas to the preparation and learning programmes for English Language teachers and to the English Language classroom.

Introduction

In every classroom, it is the teacher who interprets the curriculum and puts it into practice. It is the teacher's teaching style that motivates the students. It is the teacher's knowledge and understanding of the subject that expands or limits the knowledge and understanding of the students.

However, teachers are not automatons and vary in their knowledge, understanding and skills even in the areas in which they are keen to excel. This is as true in English Language as in any other subject. This volume of the Digest looks at what the qualities of a good teacher are and, in later issues, at the preparation and learning programmes for English Language teachers.

The results of PISA 2015 showed Singapore ranked first in all three areas tested – Science, Reading and Mathematics (Singapore Ministry of Education, 2016) both overall and for all education systems that took the tests in English. The Singapore students who took the tests praised their teachers and their approaches to teaching, particularly in Science, which was the main focus of PISA in 2015.

> *Our students in PISA 2015 reported that their teachers use a variety of strategies in teaching Science, thus contributing to our students' strong interest and performance in the subject. These include the explicit teaching of concepts, explaining how an idea can be applied to different phenomena, and giving opportunities to students to explain their ideas. Their teachers, our students added, also provide them with feedback on their performance and customise lessons according to their needs. In fact, when compared to teachers in most education systems, teachers from Singapore use "adaptive" instruction more frequently, exercising flexibility and tailoring lessons based on their students' needs and abilities.* (Singapore Ministry of Education, 2016)

In a commentary in *The Straits Times* in August 2016, Davie (2016) noted that, beyond the ranking

of education systems, there were lessons that could be learnt from the PISA results that had just been published. She noted that the Ministry of Education in Singapore had made it clear that any changes made to the curriculum in Singapore, such as the overhaul of the Primary School Leaving Examination (PSLE), was not to 'game' PISA or any other test but to ensure that the students learnt the skills and knowledge necessary to have successful and meaningful lives. The claim of Dr Andreas Schleicher, who oversaw PISA at OECD, was that the test results allowed systems that were not performing well to look at high performing systems such as Singapore in order to see what worked and to borrow and adapt to improve their own education systems.

Davie (2016) pointed to some of the factors that OECD data suggested did not help students to score well on PISA. Included in these were rote-learning, tuition, private schools and the use of IT in school. Instead, she said, the PISA data showed that what mattered was the environment and the quality of the teachers. This then raises the question as to what is meant by quality teachers and quality teaching. How can quality be measured? The next sections look into these questions.

Defining quality teachers

In defining what skilful teaching entailed, Saphier, Haley-Speca, and Gower (2008) suggested teachers needed to have certain beliefs. They needed to believe in the learners' ability to learn given the right conditions. They needed to understand that learning involved learners integrating new knowledge with what they already knew and that such learning was helped when learners felt included and confident. Moreover, teachers should understand that they needed to have a multiplicity of knowledge bases: content, pedagogy and pedagogical content knowledge. They needed to constantly learn so that they could develop the skills to better include learners more fully into the learning process. They had to do all this in the school environment by working with other teachers to mutually strengthen the work of all.

Ball and Forzani (2010) pointed out that teaching was not a natural activity. It involved skills that needed to be learnt. While having knowledge of, for example, the language or subject area being taught was important, it was not enough. Teachers had to unpack what they knew in order to help their learners. Ball and Forzani (2010) suggested that individuals who were accomplished in a particular area, whether it be a sport, an art or an academic pursuit, might not be able to teach others as, for them, the basic skills were so automatic and intuitive that they were not even aware of the need for them.

Teachers, on the other hand, had to be skilled in their subject but must also be aware of learner difficulties and be able to help learners develop the basic ideas and skills that acted as the foundation for the rest. What was even more difficult was the need for teachers to put themselves into the position of and then support learners who had different ways of dealing with learning difficulties than the teachers had used at the same stage of their learning. Further, teachers had to do this, not with one learner, but with a whole group, members of which could have differing learning styles, interests and levels of understanding to be addressed during the lesson. Identifying those different levels of understanding could be a difficult task as learners might come up with correct answers without necessarily knowing the principles behind them. They could even do so when, although they knew of the principles, they had an incorrect or incomplete understanding of those principles. To help the students correct such misunderstandings, Bransford, Brown, and Cocking (2000) suggested, teachers needed to set tasks designed to surface such misconceptions. Using the analogy of a bridge with students at one end and the subject content at the other, they suggested that a learner-centred teacher had to keep an eye on both ends of the bridge to help learners link what they already knew with new content. (See also Saphier et al., 2008.)

According to Ball and Forzani (2010), having teachers without those skills would lead to poor performance by the schools and the education system as a whole. Fortunately, the teaching skills were teachable. They suggested that it was important to identify the high-leverage practices that underlay effective teaching and to find ways to teach them. The high-leverage practices related to core teacher activities that took place in the classroom and beyond. Meeting parents about their child's progress would be one such core activity just as much as planning and using questioning to establish the understanding of students with regard to a certain

concept. Three areas needed to be considered in drawing up such a list – the content area, the cultural context and the learnability of meaningful skills – as these would make a difference to the final form of the practices on the list. Examples of such practices could be understanding why students had problems with certain grammatical features or being able to incorporate into classroom activities the language skills brought in by students from their own home background. Once such skills had been identified, Ball and Forzani (2010) felt that they could be used to strengthen the professionalism of the teaching force and define what a skilful teacher was.

Unfortunately, in a review of the literature, Naylor and Sayed (2014) felt that the term, teacher quality, had often been used without any attempt to define what it was. There had been some attempts to define what it meant but these definitions varied depending on the different interests of the writers or researchers. The definitions included those in terms of academic qualifications, classroom practices and student outcomes. Naylor and Sayed (2014) proposed that, for their study, teacher quality referred to both 'quality teaching' and 'quality teachers' and included:

- Competence: This included knowledge, skills and attitudes developed during their training (pre- and in-service).
- Teacher professionalism: This referred to teachers' commitment to the profession and its codes of conduct.
- Exercise of personal attributes and values: This was related to beliefs and attitudes such as a belief that all students were capable of learning.
- Teacher relationships with parents and the community: Relationships with the students' parents and with the general community was an important part of teacher accountability.
- Teacher practices: These were effective classroom practices the teacher applied in particular contexts in response to the needs of the students.

Naylor and Sayed (2014) noted that some studies had shown that the academic level and teaching experience of the individual teacher were not the deciding factors with regard to student learning although they did have some effect. More important were the strategies used, the quality of teacher-student relationships as well as frequent formative assessment. However, other studies had shown that the educational level of teachers was a strong predictor of student outcomes. Naylor and Sayed (2014) felt that some of the differences between the conclusions of the various studies might have been due to variation in the research methods or contexts, or possibly because what really mattered most was actual classroom practice. This had possibly been confirmed by studies that had shown that what mattered most in terms of student learning was whether teachers planned their lessons and asked students many questions in class. Naylor and Sayed (2014) suggested that, as factors such as teacher certification and years of experience could not be taken as proof of individual teacher quality, the focus had to be on the effect teachers had on their students' learning.

The quality of new teachers generally depended on the selection of candidates for teaching posts, the quality of the teacher educators, the teacher education curriculum and the assessment process.

While teacher certification could not be taken as necessarily a sign of individual teacher quality, nonetheless international testing had shown that high ranking systems consistently had highly qualified teachers. The quality of new teachers generally depended on the selection of candidates for teaching posts, the quality of the teacher educators, the teacher education curriculum and the assessment process. To improve or maintain the quality of a system therefore, in terms of selection, it was suggested that the selection criterion be set at the highest possible qualification that would still allow for the recruitment of the number of teachers required to staff the schools.

Summarizing, Naylor and Sayed (2014) suggested that there were three possible ways of checking on teacher quality. The most direct was classroom observation of the teacher. While direct, it could be methodologically challenging in that any form of observation was likely to produce changes in the behaviour of the teacher and students. Moreover, any subsequent observation report would always contain some subjectivity.

A second measure was in terms of formal qualifications. As discussed above, such measures did not

always guarantee quality as an individual qualified teacher might still not be a quality teacher. However, data had clearly demonstrated that having a body of qualified teachers generally correlated with having a quality education system.

The third measure was the use of student outcomes. Both national and international systems of assessment could be used to check the quality of student outcomes with the international systems being used to compare education systems. Some commentators, however, had questioned the validity of the formats being used in standardized testing (Davie, 2016).

Whichever measure or combination of measures was decided on, classroom observation, qualifications or student outcomes, Naylor and Sayed (2014) argued that it should take into account the larger context in which any educational system operated. It would also be important to involve teachers in the decisions so that they had some ownership of the process.

Below we look in detail at these three measures of quality teaching suggested by Naylor and Sayed (2014), starting with classroom observation.

Classroom observations

As suggested by Naylor and Sayed (2014), observation is one possible approach to assessing teacher quality. However, in order to make the observations as reliable and valid as possible, we need to establish what classroom behaviour and skills quality teachers need to demonstrate. The paragraphs that follow look at some of the possibilities.

According to Naylor and Sayed (2014), among the skills that all teachers needed to demonstrate in their teaching were these nine:

1. Using group and pair work;
2. Using a variety of teaching and learning materials;
3. Posing questions to students;
4. Demonstrating and explaining, drawing on pedagogical content knowledge;
5. Using a local language familiar to students;
6. Planning lessons with a clear structure;
7. Giving feedback, individual attention and inclusion;
8. Creating a safe environment in which students were supported in their learning;
9. Drawing on students' backgrounds and experiences.

Quality teachers also needed to have good subject content and pedagogical content knowledge (PCK).

In their review of studies of successful teacher training programmes, Timperley, Wilson, Barrar, and Fung (2007) noted a number of target teacher qualities that teachers needed to demonstrate in their teaching. One of these was a belief in their students' ability to learn no matter what the backgrounds of the students were. If the teachers did not have the belief that they could make a difference to students' learning, it was likely that the students would not learn. They thus needed to have high but reasonable expectations of their students' abilities.

Teachers also needed to be motivated and engaged. For example, Timperley et al. (2007) found that whether teachers volunteered or were assigned to attend a professional learning programme (PLP) had no effect on student outcomes. What mattered was whether teachers were motivated or engaged by the programme. When engaged, teachers were able to look at and debate their own theories of teaching and compare them to those offered by the PLP. This had to be done in terms of the likely outcomes for students.

As well as content knowledge and pedagogical knowledge, teachers also needed to demonstrate pedagogical content knowledge (PCK) or the particular knowledge of how to approach the teaching of the content subject that they were dealing with.

They also found that teachers needed to have a good grasp of assessment, its uses and the kinds of data that they could collect. While standardized testing was one possible source of data on student thinking and understanding, there were many others such as the students' drawings, student interviews and the observation of students in class. Through the use of this data, teachers could then analyse the teaching-learning relationship and make improvements to the learning process. It was important that this form of assessment was done to improve the teaching and learning and not to label the students. (See also Bransford et al., 2000.) The assessment results should be used to answer three questions for both the teacher and

the students: 'Where am I going?', 'How am I going?', and 'Where to next?' The answers provided, for both the teaching and learning, what the target was, how well the journey to the target was going and what the next step along the way should be. This question and answer process emphasized the relationship between the teaching and the learning.

For English Language (EL) teachers in Singapore, guidance to quality teaching starts with that given in the *Singapore English Language syllabus 2010 (primary & secondary)* (Curriculum Planning & Development Division, 2008). Published in 2008, the syllabus set out to provide clear guidelines for EL teachers regarding what needed to be done to teach English in Singapore schools. The aim of the teaching was stated to be to help students develop a proficiency in English that would allow them to access information and be involved with the many diverse communities inside and outside Singapore.

To do this, the teachers were to adopt a mixed approach of systematic instruction in various language areas embedded in a rich language environment. This included an increased focus on the oral skills using activities such as show-and-tell and oral presentations with an emphasis, at the early and middle primary levels, on the enjoyment of language. At later levels, the focus was to shift somewhat to more formal aspects of language study.

The students were to be exposed to a variety of texts, spoken and written, print and non-print, literary and informational. They were also to be exposed to multimodal texts and learn how to produce them. They needed to learn to listen, read and view critically. They also had to speak, write and represent in an internationally acceptable form of English that was right for their purpose, audience, context and culture (PACC).

To help students learn, the teachers were expected to adopt certain approaches that would facilitate learning. They were to set tasks in realistic contexts as this helped students to relate to what they were learning. They should also be seen to be placing the learner at the centre of their teaching, carefully considering the needs of individual students. The items had to be taught in a spiral progression that would allow the reprocessing of the different areas at increasing levels of difficulty. (See also Bransford et al., 2000, on learning.) This needed to be done in an environment that promoted the development of oral skills with the students using the language to work with their classmates as well as the teacher. At the same time, all six areas of language learning (listening and viewing, speaking and representing, reading and viewing, writing and representing, grammar, and vocabulary) were to be taught in an integrated way that included different types and modes of text. The teachers should also act as a model and should scaffold the different processes needed in the production of the different texts, oral, written and multimodal. Through all this, they were to monitor the students' learning and identify gaps so as to provide feedback that helped students improve their learning and self-assessment. (See Timperley et al., 2007, above on the use of assessment.)

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Kramer-Dahl and Chia (2012) reported on a unit where the teacher was particularly skilful at weaving into new knowledge the knowledge that the students had learnt in the past together with things from their lives outside school (Curriculum Planning & Development Division, 2008). This helped students integrate the new learning with what they were already familiar with. In the unit discussed, the target was to help the students produce a news story and the teacher weaved in what the students had previously learnt about personal recounts and narratives, and what the similarities and differences were and the reasons for these. She also used two recent news stories that she knew the students were interested in as the basis for discussion. The target activity was for the students to produce their own news story for a local paper based on a television story, adding the features needed. The students reported that the unit made them really think and that they were able to do the news story even though they had not had the confidence at the beginning of the unit.

Lwin, Goh, and Doyle (2012) examined lesson transitions and how these were managed by teachers.

Lesson transitions were the points at which the activity focus or the activity itself was changed, usually by the teacher. In this study, the focus was on transitions that introduced group or pair work. Group/pair work opened up the possibility of interthinking, thinking shared within a group that could lead to the making sense of some experience or to the solving of problems (Mercer, 2000), one of the targeted activities of the *Singapore English Language syllabus (2010)* (Curriculum Planning & Development Division, 2008). However, how well this interthinking was managed by the students could be affected by how the teacher managed the transition and how far the contextual conditions set by the teacher were 'closed' or 'open'.

The authors argued that general teacher classroom talk did not provide the opportunity for students to develop their higher order thinking skills or their ability to construct knowledge. Trying to provide opportunities for student talk in a whole class format was often difficult because of the large class sizes and thus it was necessary to provide opportunities for talk in small groups. (See Curriculum Planning & Development Division, 2008.)

However, the authors pointed out that simply putting the students into groups did not necessarily lead to productive student talk as the class norm of the teacher being in control of talk could continue to be in play resulting in little real talk taking place within the groups.

Lwin et al. (2012) looked at data from 12 English Language lessons, six from each of two Primary 5 classes, one high ability and one low ability, selected from a larger study carried out in Singapore. They focused on the language of the two teachers as they prepared the students for pair or group work. The study showed that the teachers tended to focus on the organizational aspects of the group work such as how the students should sit and what the expected outcomes were. There was little input on the thinking and interaction processes required in the groups and, as a result, the classroom climate was not conducive to collaboration among the students. A greater focus on the interaction and thinking processes could have helped the students develop the social skills necessary when dealing with the content. It was only later, when the teachers found students having problems as they circulated around the class, that they began to point to ways the students could improve their discussion.

A further issue was that the students had not been helped to understand the shift from teacher-centred to group-centred learning. They thus remained dependent on the teachers to confirm all decisions from checking spellings to choosing the right word to complete a blank. Sometimes the transitions to group work were long and recursive with the teachers often taking back control to explain something further. As a result, the class continued to be teacher led and little discussion took place within the groups.

The issue was that, although task completion might have been important, it was also important that the task be completed through the process of the students talking and working together. The teachers needed to help the students value the contributions of their fellow students and use the discussion to develop new knowledge for themselves. Moreover, they needed to choose group tasks that allowed for completion through group talk.

The study showed the need for teachers to develop their skills at providing classroom environments in which students not only learnt the subject content but also the language and social skills they needed to develop higher order thinking skills that would allow them to become lifelong learners. Developing such skills would add to the quality of their teaching. (See also Ball & Forzani, 2010, regarding the need to generate some talk among the students.)

Towndrow (2016) believed that monitoring students in terms both of whether they were on task (supervisory) and whether they were learning (formative) were important activities for the teacher. (See also Naylor & Sayed, 2014.) This monitoring, he suggested, could be accomplished through observation, checking and record-keeping. To do this, teachers might observe from a fixed position or might circulate around the class to ensure that the work was being done and to check the progress that the students were making. Doing so allowed teachers to check the status quo in the classroom and to make adjustments to their approach where necessary. Such monitoring was listed as an important activity in the *English Language syllabus 2010 (primary & secondary)* under

Assessing for Learning (Curriculum Planning & Development Division, 2008, pp. 120-121). Self-monitoring was also listed as a skill that students should learn.

With this in mind, Towndrow (2016) looked at English Language classroom data collected as part of a bigger project conducted in Singapore to see how much monitoring was taking place and whether it focused on individual students or groups. The data subset he used consisted of 32 Secondary 3 teachers from 16 schools (two per school). For each teacher, a full unit of work was observed and video-recorded. A unit of work could take several thematically related lessons.

The data showed that 28% of the units of work included supervisory monitoring and 20% included formative monitoring. In terms of the focus, 22% of the units of work included the monitoring of individuals and 13% of groups. In the first two-thirds of the lessons, teachers focused more on supervisory monitoring but, towards the end, the amount of formative monitoring increased. However, overall there was no monitoring activity at all for more than 60% of the lesson time. Very little of the monitoring that did take place involved checking for prior knowledge such as specific content knowledge, recollection of previous activities or general background knowledge, meaning that there were few attempts to link the content of the current lesson to students' prior knowledge. This was particularly true when subject specific activities, such as comprehension, creative writing and descriptive writing, were being carried out. What monitoring that was done tended to be supervisory in nature. The data showed that monitoring was generally used in all the lessons but at relatively low to medium levels, the most heavily monitored activities being coding and decoding (looking at grammar, vocabulary, pronunciation and the formal aspects of language).

Towndrow (2016) suggested that, to meet the ideal of assessing progress set down in the syllabus, teachers should aim to develop monitoring that would enable them, and their students, to more easily identify and evaluate the progress that they were making and to plan for a greater array of activities and interactions that were conducive to increased progress by the students.

Hattie and Donoghue (2016) also provided some guides as to the areas important to quality teaching. They pointed out that, although there had been a growing focus on measures of student achievement, the real focus of schools would always be on student learning brought about by the teachers' teaching. In their synthesis of 228 meta-analyses, they looked at what learning strategies seemed to help students and at how teachers could help students with these.

The first step was to recognize that the most important factor in student learning was what the students already knew. The teacher needed to establish this first as this would be the base from which to work, a point also emphasized by Bransford et al. (2000).

Knowing what the success criteria were also helped the students learn. Students who had been given this information were more capable of strategizing their approach and were more likely to enjoy the learning. Teachers thus needed to help students clearly understand the success criteria so that students knew when they were successful. Strategies that could be taught in this area included planning, having goals, and knowing what success looked like.

Another important issue was the extent to which the lesson was of direct interest to the students as this affected the students' motivation to learn and willingness to further invest in the learning.

Hattie and Donoghue (2016) suggested that another important issue was the extent to which the content of the lesson was of direct interest to the students as this affected the students' motivation to learn and willingness to further invest in the learning.

The authors suggested that there were four main messages that teachers could take from their model of learning. First, if the intention was for students to simply retain information, then lower level strategies would be the most effective. However, if the target was to develop transfer to other learning, then higher level strategies would be needed. At the same time, it was important to remember that transfer and the relevant approaches could not be adopted without the students first retaining the information necessary for the transfer. Hattie and Donoghue (2016) thus argued that it

was important in any teaching cycle to have a balance between surface and deep learning leading to transfer. Students needed to have some knowledge before they could be asked to relate different pieces of knowledge together and then relate these to new situations. This, they suggested, explained why approaches such as problem-based learning had not had the expected effect on learning. They believed that it had too often been introduced too early, before the students had had the basic knowledge needed to start solving the problems. Bransford et al. (2000) had similarly argued for a balance between activities to develop deeper understanding and those to develop automaticity. Automaticity was needed in some areas so as not to overwhelm an individual's attentional resources and instead allow for deeper skills. (See the discussion above in Ball & Forzani, 2010, of how accomplished individuals had usually automatized basic skills.)

Second, when students were more aware of the success factors related to a task, they would be more motivated to invest in the learner strategies necessary to attain that success. They would be less anxious about the demands of the learning and would be confident that they could learn.

Third, transfer was an important outcome of successful learning but this could only be achieved if students had been taught to analyse the similarities and differences between situations before they attempted to transfer what they knew to a new situation.

Finally, it was important students be taught the conditions under which the strategies they were learning would work so as to avoid them blindly applying strategies to new tasks for which they were not suitable. They needed to know when and why they could use the strategies. They needed to be taught to pause and reflect on the new tasks and to examine how they were the same and different from what they had previously experienced. Only after doing that would they be in a position to decide on the appropriate strategies.

Hattie and Donoghue (2016) suggested teachers needed to help students develop feelings of self-efficacy, focusing on the skills that they had already developed, getting them to seek help when needed from their teacher or their peers and to not blame themselves for but rather to cope with their errors. Encouraging students to seek help they needed in the class was important so that the teacher could ensure they developed the appropriate concepts and knowledge.

Students should be helped to find pleasure in their own success. The teacher could do this by helping them set goals for themselves that, while demanding, were not out of reach and then plan how they would achieve them. The success could then be attributed to the students and their own effort. It was through the teacher and students working together to develop the relevant concepts that greater learning took place rather than through the teacher simply presenting the concepts to the students.

While some learner strategies such as underlining and note-taking might possibly be learnt independent of subject content, Hattie and Donoghue (2016) argued that many, such as 21st Century Communication strategies, could not. They suggested there had been a history of failed attempts to teach these strategies outside content areas. Even for those that could be taught separately, integrating them into subject content was likely to have a greater impact on student learning.

Even though these guidelines by Hattie and Donoghue (2016) were very detailed, they were still open to interpretation making judgments based on them subjective. Moreover, it was not possible for a teacher to demonstrate all these approaches in a single lesson. An observer would need to spend some time with a class and their teacher before the observer could be certain that the full set of requirements was being met. In essence, these were two of the difficulties with classroom observation – deciding what features were necessary for quality teaching and the impossibility of observing them all in one lesson observation (Naylor & Sayed, 2014).

In summary, despite the difficulties associated with classroom observation, it could be used as one measure of quality teaching. A number of observable characteristics seemed to be generally agreed on. Quality teachers varied their teaching according to the level and needs of their students, helping their students build on what they already knew so that they integrated the new with the old. They modelled the strategies that the students

could use and when and how to use them, including how to work in teams. They assured students that making errors was part of the learning process and that asking questions helped the learning for everyone. They ensured that the classroom atmosphere was supportive rather than threatening. (See also Bransford et al., 2000, on the importance of a supportive environment and the teachers' need for a good knowledge of their subject if they were to have the confidence to deal with student questions.)

Teacher qualifications

The second method of measuring teacher quality discussed by Naylor and Sayed (2014) was the level of teacher qualifications. The difficulty noted was that a high level of qualification did not guarantee teacher quality in individual cases. However, despite that, there appeared to be a strong correlation between the qualification levels of teachers as a whole and the success of an education system.

Darling-Hammond (1997) noted, for example, that among the many programmes that had been introduced to enhance the success of schools in the USA, the most effective had been measures that ensured that teachers were well qualified to do their work. She emphasized that subject matter knowledge and teaching knowledge were what allowed them to understand their students' progress and to implement the appropriate interventions. Studies had all shown that the quality of teachers was the critical element in any education system.

The data showed that, the better were the qualifications of the teachers, the more successful was the education system where they worked.

Darling-Hammond (1997) quoted evidence from a study done in Texas that suggested that some 40% of the performance of Grades 1 to 11 students in Reading and Maths was explained by teacher expertise as measured by the teachers' scores on licencing examinations, masters' degrees and experience, which was more than any other factor examined. After the socio-economic status of the students' background was controlled for, teacher expertise as measured above accounted for almost all the differences in the achievement of students from different ethnic groups. Similarly, a study conducted in New York indicated that differences in teacher qualifications accounted for 90% of the performance of their students. Darling-Hammond (1997) stated that other research showed that what mattered was the teacher's knowledge and understanding of the subject, of student learning and of teaching approaches. In particular, teachers from a five-year programme that included a four-year undergraduate degree in the relevant subject area, and a year of teacher education with an extended 30-week internship in school were more successful than those from a more traditional four-year undergraduate programme. The five-year programmes allowed for better integration of education courses and subject areas without trading off one against the other and helped to interweave the different aspects of subject and education. The data showed that, the better were the qualifications of the teachers, the more successful was the education system where they worked.

The importance of teacher knowledge and qualifications had been further underlined by data from a selection of USA states quoted by Darling-Hammond (1997). The data indicated that education systems that introduced measures such as more or improved testing and evaluation of students, teachers and schools without at the same time upgrading teacher qualifications did not make any discernible improvements in terms of student performance. Darling-Hammond (1997) went on to suggest that the relatively low US rank on TIMMS in 1995 seemed to be related to the low levels of teacher qualifications.

The qualities of good teacher preparation programmes, Darling-Hammond (1997) believed, included:

- a common, clear vision of good teaching;
- a curriculum grounded in deep knowledge of child development, learning theory, cognition, motivation, and subject matter pedagogy, taught in the context of practice;
- an extended teaching practice (at least 30 weeks) that was closely interwoven with coursework;
- clearly defined standards of practice and performance used to guide and evaluate coursework and teaching practice;
- strong relationships, common understanding, and shared beliefs across cooperating schools and universities;

- the use of case studies, teacher research, assessments, and portfolio evaluation to make sure that what was learnt had relevance to real problems of practice.

Darling-Hammond (1997) reported that there was a trend to move away from judging teacher preparation programmes based on the input and processes that go into each programme and towards judging the programmes based on evidence of the knowledge and teaching skills of the graduating teachers.

Tatto (2015) noted that studies had shown that the content and pedagogical knowledge of teachers were positively related to student levels of achievement. To attain the required levels of expertise, teachers needed to attend university level programmes that covered theory, practice and reflection. Moreover, the research showed that it was the content of the programmes that was of prime importance rather than their structure. There were increasing demands that programmes select candidates carefully and then monitor their progress in theory and practice, including their knowledge base in the subject areas they would be teaching. A further demand was that the teachers should become adept at engaging students in the expanding curriculum in deep and meaningful ways through inquiry approaches. To achieve the latter, Tatto (2015) felt, the programmes had to use research in support of the teachers learning inquiry approaches.

Tatto (2015) thus believed that there were three key dimensions to the control of the quality of teacher qualifications: (a) entry selectivity, (b) the locus of control, and (c) the role of research. The most important influence on the programmes was the accountability requirement that the institution showed that the teachers had the required teaching skills and content knowledge. Globally, the programmes that had the greatest number of successful graduates were the most likely to cite regulations consistent with the goal of graduating competent teachers.

Tatto (2015) studied the training systems of four countries, which had been labelled, on the basis of the PISA results of 2000, as excellent (Finland), great (Singapore), good (the USA) and fair (Chile).

Tatto (2015) reported that the Finnish teaching qualification system consisted of a five-year university programme that resulted in a Master's degree. The detailed content varied depending on the level (primary or secondary) the teacher was expecting to teach at. She pointed out that the qualification was research-based in the sense that the programme included the preparation of a thesis on pedagogy or subject content and led easily into entry onto a postgraduate programme such as a doctorate. While the required qualifications were set centrally, there was some leeway for a number of the training institutions to vary their programmes to meet the needs of their local population.

Singapore, on the other hand, had a system that was centrally controlled with only one institute, the National Institute of Education (NIE), being able to offer the qualifications necessary to enter the teaching profession in government schools. However, teachers were expected to learn from each other and to be innovative in their teaching. Research, both national and international, was regarded as important to the development of the system and teacher educators and teachers were expected to be involved. Teacher education programmes were selective with entry requirements equivalent to those for universities or polytechnics. The selection was done by the Ministry of Education (MOE), who then sent the candidates to NIE to do various programmes including degrees in education or a postgraduate diploma in education for those who already had a degree. Tatto (2015) reported that some 75% of the teaching force were graduates. As part of the programmes at NIE, the trainee teachers were sent to schools to do a practicum where they worked with cooperating teachers in the schools in the preparation and teaching of lessons. The practicum was graded by a committee representing the school and NIE. Once the teacher qualified and entered a school, there were further programmes to support the teacher in the first year and beyond. Tatto (2015) reported that the Singapore system continued to function well and was able to make changes on a continuing basis using the research from international and national studies, the latter being done mainly by teacher educators from NIE. Teachers were encouraged to do action research and some also cooperated with research done by the teacher educators from NIE.

Tatto (2015) felt that the Finnish and Singaporean approaches to teacher preparation had both

proved to be successful while those in the USA and Chile had been less so. She suggested further research was needed to ascertain what made the difference so that more improved teacher qualification programmes could be developed for other education systems.

Student outcomes

The third suggested measure of teacher quality is based on the product of teaching, student outcomes. This involves looking at the learning of students, often done through national and international testing. International testing systems, such as PISA, PIRLS and TIMSS, are now used to compare across systems. The assumption is that higher scoring systems are better quality systems and must therefore have better quality teachers. In fact, Timperley et al. (2007) emphasized that quality teaching was the significant factor in student outcomes although they defined that as being more than simply scores on achievement tests. They included in their definition 'gains in academic achievement; enhancement of personal identity, self-esteem, self-concept, and attitudes towards learning; and improvement in interactions with, and acceptance by, peers and teachers…' However, standardized testing tends to be the main way of looking at standards as the testing process is relatively easy and reliable. This section looks at the high performing systems in terms of international standardized testing and the qualities that have been associated with them.

In a study that used a 'Universal Scale' based on the results of 39 batches of international tests that included PISA, PIRLS, and TIMSS, Mourshed, Chijioke, and Barber (2010) selected 20 education systems that they divided into two groups, 13 sustained improvers and seven promising starts. The student test scores for the 13 sustained improvers had improved over a period of time while those of the seven promising starts had not made great strides at that point but appeared to have the potential to do so. Mourshed et al. (2010) used positions on the Universal Scale to categorize the 20 systems according to whether they were moving from 'poor' to 'fair', from 'fair' to 'good', from 'good' to 'great' or from 'great' to 'excellent' and looked at the policies that were being implemented. They came to the conclusion that, although the 20 systems came from different cultures and geographical locations, they tended to follow the same patterns of intervention at the stage where they journeyed from one particular level to another, such as from 'poor' to 'fair'. While different reforms were introduced at each of the different stages, the education systems all introduced similar reforms at the same stages. While there were some differences according to cultural and geographical context, these were not major. The pattern seemed to indicate that different interventions were more suitable to different stages. Thus, Mourshed et al. (2010) suggested that systems in the poor category should not look at those in the great category for models of how they could improve. It would be more useful for them to look at those in the fair category for approaches that would match their stage of development. For example, on the journey from 'poor' to 'fair', it was necessary to focus on increasing school enrolment to ensure that all children received an education. This involved building new schools and recruiting more teachers. For this category, the latter were likely to be in short supply and underqualified and would thus need very specific instructions on how and what to teach when. For the higher categories, for example, from 'good' to 'great', the teachers would be more qualified and thus be in a better position to decide on what teaching practices would work best in their particular classroom context. Thus, for the higher category education systems, teachers could be given more room to decide on what to teach and how to teach and be encouraged to form professional groups to learn from each other.

For the higher category education systems, teachers could be given more room to decide on what to teach and how to teach and be encouraged to form professional groups to learn from each other.

Mourshed et al. (2010) also found that variations in expenditure per student did not always result in better test performance. Thus, within each category from 'poor' to 'great', there were systems representative of those who spent a lot per student and those who spent below the average. Some of the high performing systems achieved their results with relatively low expenditure per student. Moreover, the attainment of significant achievements did not depend on the system's starting point and significant improvements could be made in six years.

> *In the early days, outcomes improvement is all about stabilizing the system, reducing variance between classrooms and schools, and ensuring basic standards are met. At this stage of the journey, the reforms are almost always driven from the center. Later, as the system improves, the engine for improvement shifts to instructional practices. This, by its very nature, has much less to do with the center and is primarily driven by the teachers and the schools themselves: it is all about turning schools into learning organizations.* (Mourshed et al., 2010, p. 111)

To start a journey at each stage, suggested Mourshed et al. (2010), a system had to consider three aspects – where they were in terms of student achievements, what approaches were appropriate for a system in their situation and what adaptations they needed in order to make those approaches suitable for their historical, social and cultural context. Two other factors were important. The first factor was 'ignition', the condition that would spur the system into taking the necessary action. In the case of Singapore, one such 'ignition' was the 1978 Goh Report, which introduced streaming allowing for differentiation. The second factor was 'sustaining', which included the approaches necessary to ensure that gains would be retained over longer periods of time such as developing a mediating layer between the centre and the teachers and schools, a strong pedagogy supported by collaborative practice and leadership continuity.

While Mourshed et al. (2010) proposed that each stage of development tended to be associated with particular approaches, they believed that there were six basic interventions that needed to be present at all stages. These were:

- *revising the curriculum and standards;*
- *ensuring an appropriate reward and remunerations structure for teachers and principals;*
- *building the technical skills of teachers and principals;*
- *assessing students;*
- *establishing data systems; and*
- *facilitating improvement through the introduction of policy documents and education laws.* (Mourshed et al., 2010, p. 20)

According to Mourshed et al. (2010), Singapore was in the 'great' category and was on a journey to 'excellent'. Mourshed et al. (2010) suggested that Singapore had already gone through the previous stages moving from 'poor' to 'fair' to 'good' to 'great' in the years since independence in 1965. They reported that Singapore's education leaders had indicated at the time of their study that Singapore had gone from 'Survival-driven' (1959-78), through 'Efficiency-driven' (1979-96), to 'Ability-driven' (from 1997). (See Lee et al., 2013, below for a fourth phase from 2012.) In the first phase, 'Survival-driven', Singapore focused on getting a full enrolment rate at Primary level, building new schools at the rate of one per month at one period. In the second, 'Efficiency-driven', phase, Singapore focused on raising the skills of low performing students. In the last, 'Ability-driven', phase, Singapore was focusing on helping each individual student fully develop their specific skills. This meant that teaching had to vary depending on the students and this demanded an increasing independence and thus professionalization of teachers and principals. This was done through the development of network groups, the creation of a career track for teachers, the raising of standards at entry into the profession and the growth of Professional Learning Communities that encouraged teacher collaboration that looked at classroom teaching. Professional Development programmes were available and teachers were encouraged to attend but the individual teacher was able to choose the programmes that they saw as being most suitable for themselves. Like other systems, in the early years, Singapore's system had been fairly tightly controlled from the centre but, as conditions had improved in the schools, the system had moved to one in which the teaching profession as a whole, as well as the schools, were taking more control of what was being done to help improve standards. In 1997, school clusters were formed to help school principals to share their experiences and best practices.

To move to the level of 'excellent', Singapore would, Mourshed et al. (2010) predicted, need to continue to focus on developing a professional teaching body responsible for its own standards. This could be done by further developing the mediating layer (e.g. school clusters or subject-based groups) between the schools and the centre that helped in the development of a professional teaching force. There would be a need for a mediating layer that provided hands-on support to the

schools, a buffer between the schools and the centre and a channel for sharing and improving teaching across schools.

The system also had to provide for grooming new leaders who could take over when others retired. Mourshed et al. (2010) pointed out that Singapore had successfully groomed new leaders since the early years and, as a result, the education system had steadily moved forward. Educators could be promoted along the professional tracks and levels up to the position of Director-General of Education as these were considered to be professional positions within the education system. In Singapore's move from 'great' to 'excellent', Mourshed et al. (2010) noted the appropriate interventions would be the cultivation of peer-led learning for educators, the provision of additional administrative personnel to relieve teachers from administrative duties and funding for innovation that could then be shared across schools.

Lee et al. (2013) felt that Mourshed et al. (2010) had not clearly laid out what Singapore must do to go from 'great' to 'excellent'. They reported that, by 2013, Singapore had already begun a new, fourth phase in its educational development not listed by Mourshed et al. (2010). The four phases were now survival (1959-1978), efficiency (1979-1996), ability (1997-2011), and student-centric, values-driven (from 2012). Lee et al. (2013) suggested that, to achieve the 'excellent' status introduced by Mourshed et al. (2010), Singapore needed to adopt some ideas from Finland such as learner-centred teaching, high quality teachers and teacher professionalism. They suggested that there would need to be less emphasis on quantitative measures such as student scores and more on qualitative aspects such as teacher professionalism and a culture of learning in the school. Even so, there would be a need to continue bench-marking the education system in Singapore against international counterparts even while adapting to changes such as the Finnish practice of encouraging teacher professionalism that allowed teachers to adapt their teaching to meet the needs of the different students. Lee et al. (2013) argued that high quality teachers were needed because no system could rise above the quality of its teachers. High quality teachers ensured that policies and pedagogies were implemented with the right intentions and outcomes in contrast to those teachers who only gave the appearance of implementing changes in teacher practice mandated by policy but in reality continued with exams-oriented teaching. High quality teachers understood student-centred learning, how learning occurred and how to help different students learn, and also developed their own learning through research partnerships and professional learning communities (PLCs). As a result, learning would become more learner-centric led by the interests of the students rather than them being made to conform exactly to the prescribed curriculum and content.

Lee, Hung, and Teh (2013) argued that high quality teachers were needed because no system could rise above the quality of its teachers.

In a later study, Jensen, Sonnemann, Roberts-Hull, and Hunter (2016) took four of the top-performing education systems based on the PISA results, and looked at the factors that made them such strong performers as reflected in their students' performance. The four were British Columbia (Canada), Hong Kong, Shanghai and Singapore, whose students, based on PISA results of 2012, were ahead of their American peers by between 11 and 22 months in Reading, between 12 and 39 months in Maths and between 15 and 26 months in Science, with Shanghai leading the group. Jensen et al. (2016) recognized that geographic and cultural factors could affect education systems. However, they felt that the deciding factor behind the success of all four systems was the type of professional learning opportunities provided teachers within those systems. The important difference between these four and other less successful systems, Jensen et al. (2016) felt, was that, in all four, professional learning was a regular part of teacher duties and was not an add-on to be done after hours. In all four, professional learning was tied in with a school improvement cycle focused on student learning. In all four, teachers looked at student learning, considered ways of improving that learning and then checked whether the learning had improved. They did this in collaboration with their schools and colleagues and each was also responsible for the learning of their colleagues with such collaborative effort being built into their performance review. This learning was facilitated by the appointment of staff within the system who could lead the learning and the allocation of time

for professional learning. Jensen et al. (2016) contrasted this situation with that in the USA, where teachers saw professional learning as separate to teaching, and the OECD data that showed that worldwide some 40% of teachers reported that they had never taught a class jointly, observed classes nor provided feedback to other teachers. They noted that OECD data showed that USA teachers taught 27 hours a week as against the world average of 18 hours a week, the Shanghai average of 10 to 12 hours and the Singapore average of 17 hours. While this data might have seemed to point to teaching hours as a possible factor, Jensen et al. (2016) noted that British Columbia was one of the top performers but their teachers averaged 22 to 23 hours of teaching a week and they thus theorized that providing development hours was not the key. Rather the key was the quality of the professional learning and how well that was integrated into the whole school programme through inquiry-based group learning.

Giving Singapore as an example, Jensen et al. (2016) pointed out that such professional learning systems did not appear overnight but were developed incrementally over a period of years. One aspect of such systems was the appointment and recognition of professional learning leaders. In Singapore, a specific track had been developed for teachers that allowed for the appointment of such leaders (senior teachers and lead teachers) without them having to move out of the teaching that they were good at. This made it easier for them to influence other teachers with whom they worked side by side and also allowed for an alignment between teacher professional needs and the broader school objectives. The same track allowed for a select cohort of master teachers and principal master teachers that led professional learning across the system and was ultimately responsible for researching, designing and leading professional learning in their respective subject areas.

Jensen et al. (2016) believed that another important feature of these four systems was that evaluation and accountability were not simply based on student results. The teachers were also accountable for their own learning and their collaboration with their colleagues. The weight given to helping others develop their teaching increased as the teacher moved up the promotion ladder. For the schools, what was important was improvement in student learning. The lever for such learning was teacher professional learning and, thus, effective professional learning was central to school improvement and evaluation. Within the schools, the school staff developers helped to coordinate the professional learning programmes together with the leaders in teaching, the senior and lead teachers in the schools as well as the master teachers from the academies, who spent much of their time working with teachers in the schools.

Jensen et al. (2016) believed that, although there was variation across the four systems that they looked at, the foci in all cases were on the quality of student performance, of teacher instruction and of professional learning programmes. While student performance was the eventual targeted area, the evaluation of the professional learning programme had to start with its effect on instruction as it would take time for the effect of the programmes to make noticeable improvements in student performance. This suggests again that student outcomes alone cannot be the only measure of teacher quality and other measures such as teacher qualifications and observations are also needed.

Looking into how teachers could support each other, Sun, Loeb, and Grissom (2016) studied the effect individual teachers had on the test results of the students of their fellow teachers. To do this, they looked at the effect that transferred teachers in elementary and middle schools in a district in the USA had on the Maths and Reading results of students of their colleagues at the same grade level. Their study stretched over a period of ten years (from 2003/4 to 2012/3) and included 1.15 million student-year observations.

The study by Sun et al. (2016) indicated that, when the transferred teachers were more effective (in terms of the test results of their students), they positively affected the less effective teachers in the grade group they joined. The authors believed that, the less effective the teachers in the group were, the more support they needed and the more open they were to the influence of effective teachers joining the group. The indirect result of the increase in effectiveness of those teachers was an improvement in their students' results. However, if the transferred teacher was a less effective teacher, the teachers already in the group were not affected and nor were their students' results.

In sum, if effective teachers joined a grade group, the student results for the group improved but, if less effective teachers joined, the student results were not affected. The implication, the authors felt, was that mixing teachers of varied effectiveness could help raise overall effectiveness in terms of student results and this was particularly important for students of low-performing teachers. By mixing teachers of different effectiveness, schools could maximize the effectiveness of their corps of teachers as a whole. The cost of doing so in terms of money and teachers' time was much less than that of in-service professional programmes, which often had little or no effect on teacher effectiveness.

According to Sun et al. (2016), there were two factors in producing the reported result. First, the more effective teachers set standards that the other teachers were pressured to emulate (social pressure). At the same time, the other teachers were able to share the knowledge and skills through observing or interacting with the more effective teachers (knowledge transfer). This was probably of increasing importance as the isolation of the individual teachers was breaking down and teacher collaboration was on the increase. If knowledge transfer was indeed a factor, schools could increase the effect by encouraging the growth of professional learning communities where such sharing could take place. (See also Jensen et al., 2016, above on professional learning.) In evaluating the value of effective teachers, schools needed to take this potential spill over to other staff members into account.

As this section demonstrates, looking at effective systems in terms of student outcomes can give some indication of what quality teaching is even where the measures of those outcomes such as standardized testing might be seen as limited in terms of what they measure. Combining these measures with classroom observations and teacher qualifications, the identification of what quality teaching is becomes easier.

Looking at effective systems in terms of student outcomes can give some indication of what quality teaching is even where the measures of those outcomes such as standardized testing might be seen as limited in terms of what they measure.

Conclusion

This issue of the Digest has looked at teacher quality (and teaching quality). As much of what is discussed with regard to quality teaching applies across the board, much of the content of this issue is not specific to English Language teaching. Later issues in this volume of the Digest will look in greater detail at ensuring quality in English Language teaching. Here, following Naylor and Sayed (2014), who suggested that the concept of teacher quality had not been convincingly defined, three possible measures (or proxy measures) – classroom observations, teacher qualifications and student outcomes – were looked at. Each had their advantages and disadvantages.

Observations were the most direct measures provided there was some agreement as to what counted as quality teaching. Some areas that should be included were discussed. However, the very act of observation could influence the behaviour it was trying to measure, whether that was the teacher's or the students'. It could also be subjective, dependent on the views of the observer. Finally, observations tended to be of one lesson rather than of a complete learning unit and there was a strong possibility that the observer would not see the full range of related activities – or the lack of them.

The main problem with teacher qualifications as a measure was that it indicated what the individual teacher should know and do based on the learning that the qualifications signalled. However, they could not guarantee that a suitably qualified teacher would be a good teacher in the actual classroom. Despite that, studies had shown that a well-qualified teaching force correlated highly with student performance. As suggested by Lee et al. (2013), it would seem that no system could rise above the quality of their teachers as defined in terms of the knowledge and skills learnt as part of the qualification programmes. Thus, at the system level, the qualifications of the teacher cohort were an important measure.

The final test of any teaching was the quality of learning by its students. As Naylor and Sayed

(2014) pointed out there had been an increasing trend for international test results from PISA, PIRLS and TIMMS to be used to judge which systems were performing well by their positions on a league table of results. The problem with this was that the results did not fully represent what the various systems hoped to achieve. They covered limited areas (Science, Reading and Mathematics) using formats suitable for mass testing. This meant that they inevitably left out some important student outcomes such as 'gains in academic achievement; enhancement of personal identity, self-esteem, self-concept, and attitudes towards learning; and improvement in interactions with, and acceptance by, peers and teachers…' (Timperley et al., 2007, p. 33). While objective in grading, they were not objective in design.

The answer to this measurement problem seems to be to use all three in combination. Doing that may help to offset the weaknesses of each. Based on this combination of measures suggested by Naylor and Sayed (2014), Singapore is doing well. While observations indicate that there is still more that can be done in the classroom to make what is good even better, its international test results are excellent, and the qualifications of its teachers continue to improve.

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