

## Describing and Prescribing Classroom Practice: Do We Have a Common Language?

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Experienced teachers, researchers and mathematics community members, contributed to the documentation of the professional vocabulary of teachers to describe the pedagogical practice of the middle school mathematics classroom. In this paper we use this Australian Lexicon to study which terms teachers deem essential for their classroom practice. We follow with an analysis on whether these essential terms correspond with the language used in commonly disseminated government documents. This examination has given us an insight into the terms that are of great significance and value for our teachers and provided a detailed picture of vocabulary alignment with various official communications.

Teams of researchers internationally have been engaged in documenting the professional language of middle school mathematics teachers as part of The International Classroom Lexicon Project. The vocabulary that teachers use to name the phenomena of the mathematics classroom has been identified in 10 communities worldwide including Australia, Chile, China, the Czech Republic, Finland, France, Germany, Japan, the USA, and more recently South Korea (Mesiti & Clarke, 2017).

A significant product of the work of the research teams has been the documentation of a lexicon that identifies the actual terms, operationalised with descriptions and examples, by which teachers name the pedagogical practices of their world. The Australian Lexicon has been noted as having significant practical value and can be used as a foundation to advance discussion about pedagogical practice; to engage teachers and pre-service teachers to better equip them with a sophisticated language of practice; and, to engage in reflection about the challenges of practice (Mesiti & Clarke, 2018).

In this paper we use the lexicon as a starting point to study which terms, from the entire collection of 61 Australian terms, teachers deem *essential* for their classroom practice. We follow this analysis with an investigation on whether these essential terms correspond with the language used in commonly disseminated government documents.

### The Professional Language of Teachers

Teachers acquire a professional vocabulary related to activities that enhance student understanding and the instructional orchestration of such activities. This language of practice with an accompanying vocabulary, framework and category system appears underdeveloped in teaching (Grossman, Compton, Igra, Ronfeldt, Shahan, & Williamson, 2009; Lampert, 2000; Lortie, 1975; McDonald, Kazemi, & Kavanagh, 2013). A teaching culture that does not appear to support informal learning opportunities (Connell, 2009) and engagement in professional discussions about the efficacy of classroom activities and practices (Lampert, 2000) results in “a language of practice [that] remains flat or non-existent” (p. 90). A documented lexicon would help foster professional discussions about practice similar to the formal tradition of Lesson Study (Lewis & Tsuchida, 1999) and assist in the development of a well-articulated professional lexicon with improved value to the profession. The building of professional communities, particularly among teachers, is

challenging but it is these professional opportunities and experiences (and the sharing of a common language) that characterise successful learning communities (Grossman, Wineburg, & Woolworth, 2001).

The theoretical position adopted by the International Classroom Lexicon Project, as suggested by the Sapir-Whorf hypothesis, is that our experience of our classroom, of the activities and practices within, are mediated and shaped by the language we have available to us to assign a name to what we see and experience. “We see and hear . . . very largely as we do because the language habits of our community predispose certain choices of interpretation” (Sapir, 1949, p. 162).

## The Australian Lexicon

The study of the Australian Lexicon was driven by the following research question: *What are the terms that teachers use to describe the phenomena of the middle school mathematics classroom?* In order to facilitate addressing this question a video stimulus package of Year 8 mathematics lessons, representing a variety of classroom settings and approaches, was compiled, shared and viewed to catalyse data generation. Researchers were asked to watch the videos and respond to the prompt: *What do you see that you can name?* (Mesiti & Clarke, 2017). This prompt was carefully worded as to not limit what could be named. Indeed, it was not necessary for the named phenomena to be present in the videos at all, the main purpose of the videos was to stimulate thinking so that the identification of one phenomena/term, such as ‘scaffolding’, may lead to recollection of associated terms, such as ‘differentiating’.

*Emphasis on teacher voice.* Two experienced teachers of middle school mathematics participated as authentic members of the research team, which also included three academic members. The wider practitioner community, representing insiders, informers as well as collaborators were involved in commenting on the clarity of the draft lexicon as well as involved in the structured validation process. We enacted a ‘negotiative’ methodology by participating in collaborative consultations with our teacher partners, and this approach ensured authority was accorded to teacher voice in the generation of each national lexicon.

Research members from the Australian team met regularly to share possible candidate terms and advocate for their inclusion in the lexicon. Where there was disagreement, authority was accorded to the opinion of the experienced teachers; if they agreed the term or phrase was one familiar to them (and their colleagues) then it was included in the draft lexicon. The draft lexicon was subsequently offered up for validation. In the first instance, this led to the collection of additional data to determine the extent to which the local community of mathematics education researchers endorsed the terms and their accompanying operational definitions. This draft lexicon was further refined and offered, by online survey, to the broader Australian mathematics education community. 155 responses to the survey were received and all terms were considered familiar to at least two-thirds of respondents.

### *Content and Structure of the Australian Lexicon*

The Australian lexicon includes 61 terms that have been validated as familiar to teachers of secondary school mathematics. The terms are each operationalised with a short description, including examples from the classroom to help fully illustrate the term and non-examples that help distinguish the practice/activity from something quite similar. A selection of terms is given in Figure 1.

<p><b>elicit understanding</b></p> <p>An activity undertaken by the teacher or students for the purpose of drawing out students' understandings of mathematical ideas, concepts or processes.</p>	<p><u>Example:</u></p> <ul style="list-style-type: none"> <li>• The teacher asks a student to demonstrate a mathematical idea on the board and articulate their understanding of that idea.</li> <li>• The teacher asks students to explain how a specific solution relates to a general case.</li> </ul> <p><u>Non-example:</u></p> <ul style="list-style-type: none"> <li>• <i>Students give answers to multiple-choice questions without elaborating or explaining their choice.</i></li> </ul>
<p><b>practising</b></p> <p>The activity of repeating a procedure for the purpose of improving efficiency or accuracy in its use.</p>	<p><u>Example:</u></p> <ul style="list-style-type: none"> <li>• A student solves ten consecutive tasks all involving the addition of fractions.</li> </ul> <p><u>Non-example:</u></p> <ul style="list-style-type: none"> <li>• <i>A student attempts to make use of the property of similar triangles in a real-world context for the first time.</i></li> </ul>

Figure 1. A sample of terms and operational definitions from the Australian Lexicon.

Small teams of experienced teacher practitioners were invited to organise the lexicon into groups and suggest category names for these groupings. Terms could appear in more than one category if it was determined there was a strong association with that category). Five category names were subsequently identified: Administration (8 terms); Assessment (10); Classroom Management (5); Learning Strategies (27) and Teaching Strategies (49).

### Describing Practice: Teachers' Essential Terms

Research on Australian teachers' essential terms was driven by the following question: *What are the terms that teachers consider essential for their classroom practice?* Teachers were offered the 61 lexical terms and invited to respond to the following prompt: "These are the terms in the Australian Lexicon. If you were to reduce the terms to 'ten essential terms' what would they be?" When invited to articulate her interpretation of the prompt, one of the respondents explained:

To me, the essential terms refer to those things that every teacher should have in their toolkit to ensure successful teaching and learning. They are the most important strategies that a teacher would employ in their teaching. They are the strategies every teacher should know and use because we know they make a difference in learning. (Marie, personal communication, 2019)

Responses were collected from 52 Victorian mathematics teachers, with varied teaching experience, enrolled in university subjects. The essential terms were sorted according to frequency of selection by respondents and seven terms were indicated as essential by more than half of those surveyed: *Feedback* (77%), *Questioning* (69%), *Scaffolding* (63%), *Reflecting* (56%), *Engaging* (54%), *Assessment* (52%) and *Differentiating* (52%). A further eight terms followed with a frequency ranging from 21% to 44% (see also Figure 3).

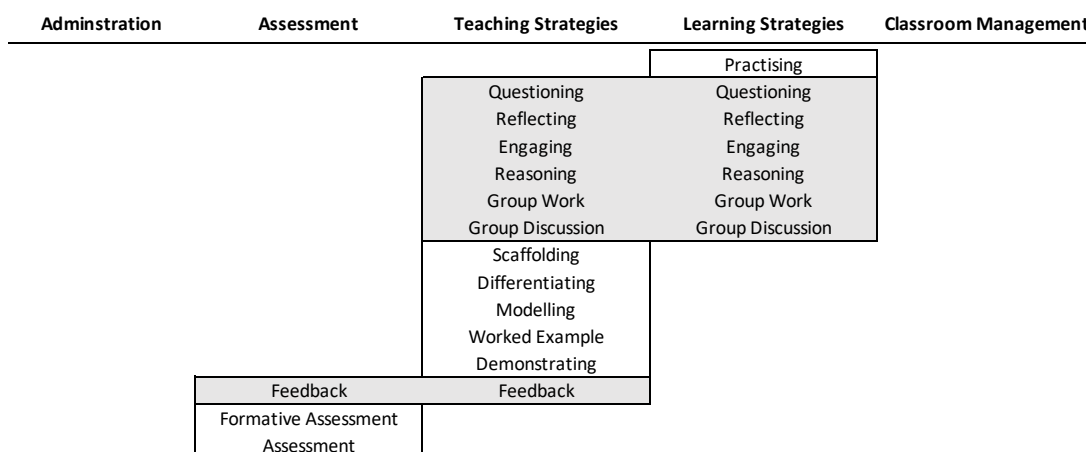


Figure 2. Essential terms organised by lexical category.

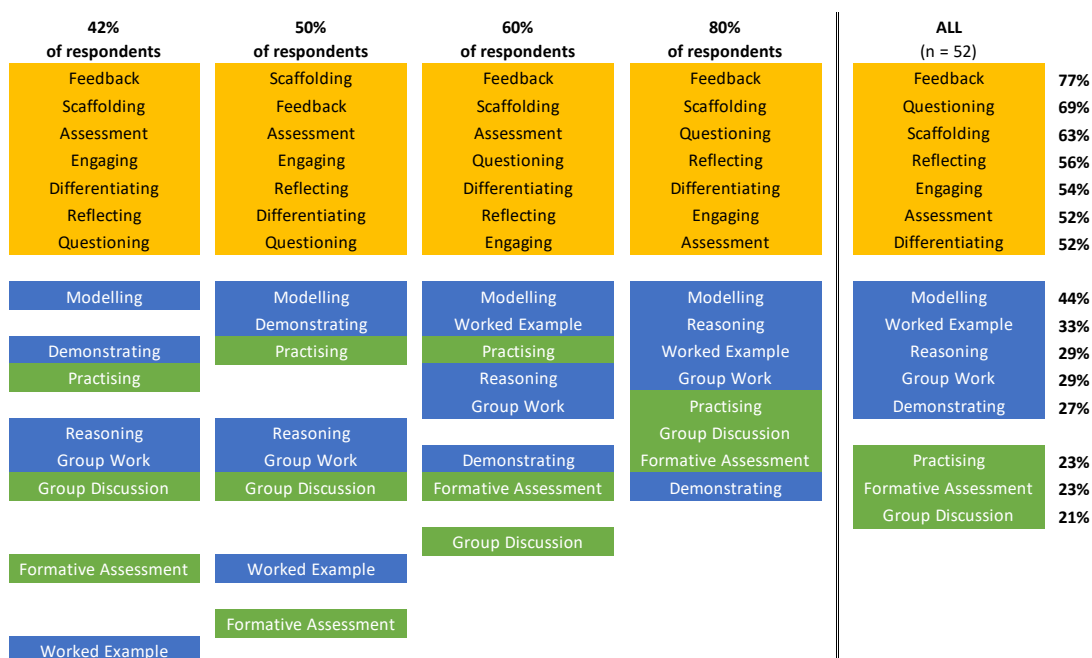


Figure 3. Findings at different points of data collection revealing early data saturation.

As data were collected periodically and not all at once, an interesting phenomenon was observed. The top seven essential terms stabilised after 42% of the data was collected and indicated early data saturation (see Figure 3). This consistent valuing of practices that are considered essential appears indicative of community consensus. *What might we offer as an explanation for this agreement in valuing of terms by teachers?* This question led to a subsequent data collection study involving a collection of government documents.

### Prescribing Practice: Prevalence of Essential Terms

There appears agreement regarding the more essential terms of a lexicon of practice. *However, is this language of practice shared by policy makers? Are the terms identified in this analysis very prominent in government documents?* In order to address these questions, we collected easily accessible government documents familiar to teachers. These included

two nation-wide documents, one about teaching standards, one about the mathematics curriculum, and three Victorian documents for teachers offering advice about practice. The curriculum document was included in the collection of government documents under review because of the essential intersection of curriculum material as context for classroom practice and context to support planning.

1. Australian Professional Standards for Teachers  
(retrieved from [www.aitsl.edu.au](http://www.aitsl.edu.au), 136K visits\* in February 2019)
2. a. High Impact Teaching Strategies (HITS);  
b. Pedagogical Model;  
c. Practice Principles  
(retrieved from [www.education.vic.gov.au](http://www.education.vic.gov.au), 1.36M visits\* in February 2019,  
*Home>For schools>Teaching materials and methods*)
3. Australian Curriculum - Mathematics  
(retrieved from [www.australiancurriculum.edu.au](http://www.australiancurriculum.edu.au), 232K visits\* in February 2019)

\* statistics collected from SimilarWeb ([www.similarweb.com](http://www.similarweb.com))

The number of occurrences for each of the 15 essential terms in each of the documents was calculated with the use of NVivo and recorded in Figure 4. Where the essential term was a single word, such as *Differentiating*, stemmed words were also included in the count like *Differentiation* and *Differentiate*. In the case where the lexical item was a phrase, such as *Group Work*, to prevent overcounting the occurrence needed to be an exact match.

Teachers' Essential Terms	AITSL	Department of Education & Training Victoria			ACARA
	Australian Professional Standards for Teachers (5447 words)	High Impact Teaching Strategies (12087 words)	Pedagogical Model (12516 words)	Practice Principles (11033 words)	Australian Curriculum - Mathematics (20600 words)
Feedback	20	132	89	47	----
Questioning	----	97	35	16	32
Scaffolding	----	35	14	6	----
Reflecting	4	28	61	47	32
Engaging	52	44	121	115	2
Assessment	46	86	161	96	1
Differentiating	6	25	21	7	----
Modelling	12	30	113	18	36
Worked Example	----	13	2	----	----
Reasoning	----	2	8	1	71
Group Work	----	3	2	----	----
Demonstrating	35	65	39	3	18
Practising	----	1	7	----	1
Formative Assessment	----	12	11	2	----
Group Discussion	----	3	2	----	----
	175	576	686	358	193

Figure 4. Raw count of occurrences of the teachers' essential terms within the government documents.

To facilitate a comparison across documents of different lengths (see top of Figure 4 for word counts per document), the figures were standardised to represent a count from a document of 12 000 words in length and sorted by frequency (Figure 5).

AITSL		Department of Education & Training Victoria						ACARA	
Australian Professional Standards for Teachers (standardised to 12000 words)		High Impact Teaching Strategies (standardised to 12000 words)		Pedagogical Model (standardised to 12000 words)		Practice Principles (standardised to 12000 words)		Australian Curriculum - Mathematics (standardised to 12000 words)	
Engaging	115	Feedback	131	Assessment	154	Engaging	125	Reflecting	19
Assessment	101	Questioning	96	Engaging	116	Assessment	104	Questioning	19
Feedback	44	Assessment	85	Feedback	85	Feedback	51	Engaging	1
Differentiating	13	Engaging	44	Reflecting	58	Reflecting	51	Assessment	1
Reflecting	9	Scaffolding	35	Questioning	34	Questioning	17		
		Reflecting	28	Differentiating	20	Differentiating	8		
		Differentiating	25	Scaffolding	13	Scaffolding	7		
Demonstrating	77	Demonstrating	65	Modelling	108	Modelling	20	Reasoning	41
Modelling	26	Modelling	30	Demonstrating	37	Demonstrating	3	Modelling	21
		Worked Example	13	Reasoning	8	Reasoning	1	Demonstrating	10
		Group Work	3	Worked Example	2				
		Reasoning	2	Group Work	2				
		Formative Assessment	12	Formative Assessment	11	Formative Assessment	2	Practising	1
		Group Discussion	3	Practising	7				
		Practising	1	Group Discussion	2				
	385		573		657		389		113

Figure 5. Standardised counts sorted by frequency within the three blocks of essential terms.

An additional count was conducted of the prevalence of the remaining 46 terms from the Australian Lexicon that did not emerge as the most essential from the initial study. That is: *Were there other terms of practice present in the Australian Lexicon that were more prominent in these documents than those that emerged as ‘essential’ according to our teacher practitioners?* These results are presented, with standardised counts, in Figure 6.

AITSL		Department of Education & Training Victoria						ACARA	
Australian Professional Standards for Teachers (standardised to 12000 words)		High Impact Teaching Strategies (standardised to 12000 words)		Pedagogical Model (standardised to 12000 words)		Practice Principles (standardised to 12000 words)		Australian Curriculum - Mathematics (standardised to 12000 words)	
Applying	29	Monitoring	51	Monitoring	35	Reviewing	28	Applying	31
Reviewing	18	Reviewing	28	Reviewing	26	Guiding	22	Explaining	21
		On Task	26	Explaining	18	Monitoring	12		
		Encouraging	24	Guiding	18				
		Applying	21	On Task	15				
		Explaining	19	Motivating	14				
		Guiding	16	Encouraging	13				
				Applying	11				

Figure 6. Occurrences of the remaining terms from the Australian Lexicon (excluding the 15 essential terms).

*Australian Professional Standards for Teachers.* Of the 15 terms, only seven were present in the standards document; however, five of these were from the most commonly identified essential terms. Terms most frequent in the standards document include: *Engaging*

(115), *Assessment* (101) and to a lesser degree *Demonstrating* (77) and *Feedback* (44). The standards document is introduced by AITSL on their website with the following statement:

As a teacher, it's your role to grow and develop the minds in your classroom. That's where the Australian Professional Standards for Teachers comes in. The Standards let you know what you should be aiming to achieve at every stage of your career. So you can improve your practice inside and outside of the classroom. ([www.aitsl.edu.au/teach/understand-the-teacher-standards](http://www.aitsl.edu.au/teach/understand-the-teacher-standards))

The aim of this document is to familiarise teachers with the key elements of quality teaching with descriptors that represent effective, contemporary practice in Australia (AITSL 2011, p. 1). In this analysis it appears that the language of the document aligns well with the top seven practices more than 50% of teachers deemed essential. These practices appear very frequently, a standardised total of 385 times, with a noticeable absence, however, of the terms *Questioning* and *Scaffolding*.

*Australian Curriculum - Mathematics*. It was found that eight terms from the essential set of 15 were present in the document but mostly infrequently; there were 193 occurrences in total, 113 when standardised. This contrasts with standardised totals from the other documents: 385, 573, 657 and 389. However, this document traditionally has a necessary increased focus on the 'what' is taught as opposed to 'how'. Also, the increased presence of terms *Reasoning*, *Applying* and *Modelling* may be explained by the distinctly mathematical feature of these words.

*HITS, Pedagogical Model and Practice Principles*. This trio of documents offered by the Department of Education and Training Victoria to teachers to support "ways to improve teaching" ([www.education.vic.gov.au/school/teachers/teachingresources](http://www.education.vic.gov.au/school/teachers/teachingresources)) aligned particularly well with the language of practice of teachers and teachers' selection of essential terms. All three documents indicated numerous occurrences of the following essential terms: *Feedback* (131, 85 and 51 standardised occurrences respectively); *Assessment* (85, 154, 104); and *Engaging* (44, 116, 125). The *HITS* and *Pedagogical Model* papers indicated similar increased emphasis on *Demonstrating* (65, 37). Both the *Pedagogical Model* and *Practice Principles* documents included occurrences of the essential term *Reflecting* (58, 51). *Modelling*, at 108 occurrences, was featured significantly by the *Pedagogical Model* document; this was true also of *Questioning* (96) for the *HITS* document.

In contrast, the occurrences of the terms *Scaffolding* (35, 13, 7) and *Differentiating* (25, 20, 8) did not align with the teachers' choices when determining the essential terms: 63% of respondents chose *Scaffolding* and 52% chose *Differentiating*. Terms very much under-represented by the Victorian documents, but of importance to teachers, included: *Reasoning* (2, 8, 1); *Practising* (1, 7, 0); *Worked Example* (13, 2, 0); *Group Work* (3, 2, 0); and *Group Discussion* (3, 2, 0). *Monitoring*, which was selected by only 12% of teachers as essential was prevalent in the *HITS* (51) and *Pedagogical Model* (35) documents.

## Conclusion and Implications

The findings reported above result from an analysis of teachers' responses to a prompt that invited them to reduce the 61 terms of the Australian Lexicon to an essential set of 10. Our primary interest is lexical, the vocabulary teachers use to describe the phenomena of the classroom, and when given the opportunity to make a selection, which of these terms are *essential* to their personal, pedagogical practice. Their choices align quite meaningfully, despite some discrepancies, with documents offered by the Department of Education and Training Victoria particularly the *HITS* and *Pedagogical Model* documents. Three explanatory hypotheses are possible (and would require further investigation):

1. The preparation of government documents involved a high level of consultancy with teachers.
2. Teachers are attentive to and make frequent use of published resources (as indicated by traffic to the websites).
3. There is a culture of teaching practice that is reflective of a community of practice (CoP) (Lave & Wenger, 1991) with its own vocabulary. These documents both reflect and shape the vocabulary that arises from the field.

A lexicon of teacher practice would assist in the initiation of novices into the profession and support reflective practices to improve teaching and learning.

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