Knowledge is Wisdom?

Observations from primary classrooms in the Maldives

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I saw a school that has the motto "Knowledge is Wisdom" on its front gate. I had recently observed lessons in many primary classrooms and the misconception embodied in that motto helped to explain some of the problems I had identified.

I am working in schools in Maldives during 2013 as a Teacher Trainer. My project is to identify key issues of classroom practice that needed to be addressed, and then design Professional Development (PD) strategies that can be facilitated by the Teacher Resource Centres in each atoll.

My main source of data for the needs assessment was observation of teachers' practice. Many aspects of the teaching practices I observed were consistent across subjects, grades, and in different islands and atolls. The following article outlines some key issues I identified and that have formed the basis of my subsequent PD programs.

Didactic teaching

The teaching I observed is almost always 'didactic' – a one-way transfer of facts from teacher or text book to student. It aligned with the simplistic model of learning that Cohen (1988) described:

> *"If knowledge is facts, then teaching is telling and learning is remembering."*

However, as Stoll and Schubert (1996) explained:

> "*Data is not information, information is not knowledge, knowledge is not understanding, understanding is not wisdom*."

The "Knowledge is wisdom" school motto fails to recognise that teaching children to remember facts does not make them educated or wise. Knowledge alone is not wisdom.

Initially I focused my observations on lessons in Environmental Studies (Grades 1-5) and General Science (Grades 6-7). Both of these syllabuses contain advice for teachers about the need for active, inquiry-based modes of learning. The Environmental Studies syllabus (Educational Development Centre, 2003a) mandates that the teaching:

> "*…is based in the inquiry method of learning, predicting possible solutions to problems, constructing hypotheses, considering different approaches, and designing methods for gathering, organizing and processing information."*

The Science syllabus (Educational Development Centre, 2003b) has a similar requirement:

> "*Practical work should include series of open investigations. Students need the opportunity to do open investigations if they are to develop the investigation and problem solving skills that are at the heart of scientific literacy*."

Those syllabus statements, intended to shape the pedagogy for both subjects, are not evidenced in the lessons I have observed. In fact when I show them to teachers they report having never seen them before and are often quite surprised by them.

The shrinking curriculum

In the Maldives National Curriculum, each subject syllabus typically has a set of key objectives, for example General Science is structured around 1) *Knowledge and understanding*, 2) *Skills* and 3) *Values and Attitudes*. The syllabus clearly states that all of these must be taught and assessed, but nearly all lessons concentrate on teaching and assessing *Knowledge* (memorised facts). I have seen very little evidence of teachers addressing other syllabus objectives such as *Skills*.

A key reason for this is that virtually all teaching I saw was directly from textbooks, which concentrate on factual knowledge and largely ignore the other objectives. This goes against the advice in syllabus documents, such as this example from the Social Studies Syllabus 6&7 (Educational Development Centre, 2002):

> *"The textbook is only a basic guide. The success of this syllabus lies in the vigilance of the teacher towards the syllabus and through teaching with the effective use of appropriate teaching aids."*

If the teacher does not use a variety of other activities and sources of information, they cannot fulfil their role of teaching the syllabus. When I ask primary teachers if I can see a copy of the syllabus, they hand me the textbook (high school teachers usually direct me to a website of O-Level or A-Level past-papers). No teacher indicated that they had read the actual syllabus and I have not yet found a teacher who has a copy available. Teachers' planning typically involves a "Scheme of work" term outline, which is a list of fact-based topics copied from the textbook's table of contents. I have not seen any planning that addresses the more challenging syllabus objectives that are not covered by the textbook. Similarly, I have not seen objectives other than *Knowledge* being assessed.

School principals tell me that children who gain high marks up to Grade 7 usually do less well once they begin the Cambridge syllabus in higher grades. The following table, a typical set of objectives for a Cambridge O-Level subject, helps to explain why. Students who have only been taught 'knowledge' for most of their schooling do not have the skills required by the other 70% of the course.

Business Studies – O Level	
Assessment Objective	Weighting
Knowledge and understanding	30%
Application	30%
Analysis	20%
Evaluation	20%

Figure 1. Example of weighting of assessment objectives
University of Cambridge International Examinations (2010).

Single source

I was surprised by how often I saw the same, simplistic lesson structure. Typically, lessons fit a model something like this:

- Teacher presents a set of facts.
- Children do a group activity that records those facts.
- Groups report back on the facts and are judged right or wrong.
- Children individually record the set of facts in books or a test sheet.

The facts selected for the lesson come directly from the textbook. I rarely saw any information presented that was *not* in the textbook. When I looked at tests that teachers were preparing, they required students to memorise exact statements from textbooks, rather than more

general applications and understanding of topics. One of the problems with this approach is illustrated by the following example:

Heart rate

A Grade 7 General Science test had this multiple-choice question:

> *Our normal heart rate is about:*
>
> *(A) 70 beats/minute* *(B) 80 beats/minute*
>
> *(C) 50 beats/minute* *(D) 90 beats/minute*

I had a look in the relevant text book and found this sentence, which had clearly prompted the teacher's question:

> *Your heart beats about 70 times each minute.*

The teacher marked "A" as the only correct answer, but notice that word "about". It means that option "B" (80 beats/minute) is also a reasonable answer. I explored another source, as a dedicated student might when doing revision. It took ten seconds to type the words "normal heart rate" into Google and get the following response from a reasonably reliable source:

> *A normal resting heart rate for adults ranges from 60 to 100 beats a minute.*
> *(www.mayoclinic.com/health/heart-rate/AN01906)*

So answers A, B and D are correct if we are assessing "understanding" rather than "memorising words from a text book". Not only is this assessment low-order, it actually discriminates against a student who has gained a good understanding of the topic from other sources.

This effect continues through to university. A teaching colleague showed me a Masters level exam question that asked her to describe "the three kinds of listening skill". She had read widely enough to understand that many aspects of listening are described in the education literature, but she would have been marked wrong if she had not memorised *which* three were listed in this course's text.

Another example was a Grade 3 class learning from the text book about "Parts of a bird". They were taught that birds have a beak, legs and wings and the students copied a diagram from the textbook into their notebooks. How many Grade 3 children did not know those facts before they started Grade 1?

Figure 2: Parts of a bird
Grade 3 Environmental Studies

On the island, there are chickens running around and many people have birds in cages. Consider how much more interest and depth of learning would have occurred if the teacher had simply brought one or two live birds into the classroom and said, "Observe closely, write what you've noticed about the bird's features and behaviour, and draw close-ups of some of its parts. Then we will talk about what you've learnt."

Similarly, I saw children copying their teacher's simplistic sketch of a tree from the whiteboard when there were several real trees in plain view beside their room.

Lower-order thinking

In March 2013, all Grade 4, 7 & 9 students in Maldives were tested in Phase 1 of a "Longitudinal Study on the Impact of Curriculum Reforms." A preliminary finding of this study was that children in Maldives do not use Higher-order thinking skills (National Institute of Education, 2013).

Higher-order thinking skills were described in Bloom's Taxonomy (Bloom, 1959) and revised by Anderson et al (2000). Figure 3 shows the hierarchy with the simple skill of *Remembering* on the bottom and progressively more complex thinking skills in the levels above.

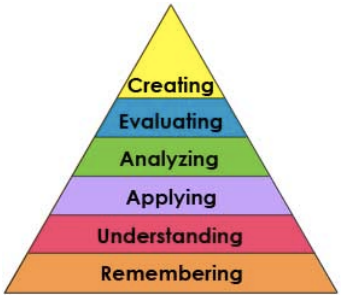

Figure 3. Bloom's Taxonomy – Revised (Anderson et al, 2000)

The lessons and assessments I have observed are located on the ground floor, *Remembering*. They occasionally go upstairs to *Understanding,* but almost never challenge students to climb the heights of *Applying*, *Analyzing*, *Evaluating* or *Creating*. However it is the higher levels of the taxonomy that carry most of the weighting in O-Level and A-Level syllabuses, and many subjects (such as the example in Figure 1) use terms directly from Bloom to structure their objectives.

The Longitudinal Study's finding that these skills are not used is a natural outcome of the kind of teaching and assessment I have already described. The facts being taught are simplistic and a student's role is to just remember them.

Test papers I have sampled consist of simple questions that usually require direct quotes from the textbook. Questions tend to begin with terms like "Name", "List", "Define". Most do not include higher-order terms like "Explain", "Compare", "Evaluate", or even a simple "Why?"

Sadler (1988) explained that student reports should describe the *quality* of their achievement, not just a *quantity* of questions answered correctly. The tests I have seen do not cover a range of quality. Consequently I have been advising teachers and administrators that if all exam questions are based on memorised text book facts, students should be graded no higher than a 'C', even if they gain 100%, because there has been no opportunity for them to demonstrate a higher quality of work.

In tests and in classroom questioning there is typically only one correct answer. Exploring alternative ideas - "*How else*?" - or asking "*Why?*" can support richer learning but I seldom saw this happen. The following observation illustrates this point:

Chilli story

In a Grade 2 Environmental Studies lesson about soils, four facts from the textbook were taught:

1. black soil is for growing trees;
2. fine white sand is for making bricks;
3. coarse white sand is for decorating outside houses;
4. muddy soil is for growing yams.

After these facts had been presented and repeated in several activities, the teacher questioned the children.

Teacher: *What is the black soil for?*

Girl: *Growing chillies.*

Teacher: *Everyone, is she right?*

Class: *No!!!*

Teacher: *Try again - what is black soil for?*

Girl*: It's good for growing chillies.*

Teacher: *No, that's not right. Black soil is for growing trees.*

Girl: *But at my house we use it to grow chillies!*

Teacher: *Oh yes, you can use black soil for growing trees and chillies.*

I was very impressed by a little girl who was determined to present her own piece of knowledge, which she knew to be true from her own observation, although she knew it was not an answer the teacher wanted. What an opportunity for the teacher to ask, "Children, what else have you seen growing in black soil?"

Teaching to the test

I've talked with teachers about how limiting the textbook can be if they don't use other sources and activities. Some replied that they have been told by supervisors to only teach what will be in the test. And what will be in the test? Simple facts from the textbook. That scenario hints at a solution: why not change the tests?

I have observed that teachers write tests by looking through the textbook and writing questions from facts they find there. They do not refer to the syllabus objectives; as noted earlier, I have yet to meet a teacher who knows where to find a copy of the syllabus. A fundamental change that needs to occur is that assessments are based on the syllabus objectives – *all* of them, not just the ones that are easiest to teach. The challenge is stated clearly in this quote:

> *Assessment efforts should not be concerned about valuing what can be measured but, instead, about measuring that which is valued. (Banta et al 1996)*

My observations suggest that schools are putting a high value on things that are easy to measure, and are devaluing (or completely ignoring) aspects of each syllabus that are not. Teachers, students, administrators, parents, private tutors are all focused on getting high numbers of marks, without considering whether those marks are evidence of quality work or of students learning the more challenging aspects of the curriculum.

Wiggins (1989) explained that:

> *"…it is what and how teachers choose to assess that communicates to students what learning to value."*

Students are given a powerful lesson on what to value by the many tests they do, and the lesson is that they need to memorise simple facts. Classrooms run on the principle that "learning is remembering". This view of learning does not prepare them for life, or even for an O-Level exam.

Assessments need to value the more complex aspects of learning. This is not an easy thing to do. It is much easier to test recall of a fact than to judge whether a student can *apply* knowledge to solve a problem, *analyze* a solution, use evidence to *evaluate* which side of an argument is strongest, or use their learning to *create* something original.

Where to from here?

I have described a number of significant problems with the teaching I have seen. I don't want to finish this article without making some suggestions about a way forward, although I acknowledge that further research is needed to properly guide future strategies. This final section gives examples of how some teachers in the Maldives are addressing the issues I've discussed.

I have found many teachers who are keen to improve their teaching and assessment practice. Here is the project challenge one group planned for their Grade 5 students:

> *Find out about the climate in Maldives and of one other country of your choice. Include the following about climates: location of country; temperature; rainfall; seasons; other information about the climates in both places.*

That project could be completed by simply copying facts from books or WikiPedia, so we talked about how we could challenge the students to use higher-order thinking. Here is their 'new improved' project challenge:

Compare the climate of (1) the Maldives and (2) another location where the climate is very different.

- *For each location, a)* ***Describe*** *the climate; b)* ***Explain*** *why the climate is like that; and c)* ***Give examples*** *of how climate influences lifestyle, e.g. houses, food, clothing, leisure.*
- ***Evaluate*** *which location has the best climate to live in. List evidence for and against each location, then choose the climate you think has the best lifestyle. Explain your reasons for choosing which is best.*

Notice that students are required to use evidence to justify their evaluation – they can't look up those answers, they have to create them by using higher-order thinking.

How do students know what is valued?

Sadler (1989) talked about "letting students in on the secret" of what teachers would value when assessing their work:

> *"Develop in students an understanding of quality roughly similar to that held by the teacher so that they can evaluate their work in the act of production itself."*

Marking guides are an important way to show students and parents what to value. The Grade 5 project mentioned above started out with this one:

Marking criteria:

Neatness – 2 marks.	*Creativity – 2 marks.*
Content – 5 marks.	*Completion – 1 mark.*

Figure 4. Example of marking guide – 'Before'

It gives students no clues about what is required for the 'Content' marks, but it gives 50% of the marks for other things that are not even in the syllabus, so a student could pass without demonstrating any subject skills or knowledge. Below is the one we wrote to replace it. It gives separate grades for *Understanding* and *Skills*, and states what actions match each grade. It sends a strong message to students, parents and tutors that *thinking* is more important than a set of facts in a neatly published booklet.

Grade 5 Environmental Studies: Investigate and compare climates

	Understanding		Skills
	Compare climates in two places.		**Investigate and communicate findings.**
A	Uses evidence to **evaluate** which climate has the best lifestyle.	A	Uses multiple, reliable sources to investigate. Uses words and pictures to present evidence and ideas accurately.
B	**Explains** the causes of different climates and how they affect lifestyle.	B	Booklet is clear, interesting and easy to understand.
C	**Describes** differences between two climates.	C	Finds information about climates and uses it to answer questions accurately.
D	Knows simple facts about climates.	D	Finds and presents some facts about climate.
E	Booklet contains facts.	E	Submits booklet.

Figure 5. Example of marking guide – 'After'

Note that this model of marking guide differs a little from typical rubrics, which usually have the same core statement in each box and just change or add adjectives as the level goes up (e.g. limited/satisfactory/good/excellent). This model is 'additive', i.e. to achieve a 'B' it is assumed the work matches the 'B' descriptor but also includes the qualities listed in the grades below it.

The example below shows another step forward by a group of teachers. They started out with a simple test of facts about soil based on the Grade 3 textbook. After we discussed the syllabus objectives, they replaced that test with a more active assessment where students dug in the soil, looked closely at what they found, and applied communication skills to record their

findings in words and diagrams. The marking guide they created does not produce a set of 'marks' to measure and label students, but it does clearly describe the standard of their learning. More importantly, it values what students can *do*, not just what they can *remember*.

Grade 3 Environmental Studies: Observing soil

	Understanding		Skills
	Recall and explain scientific ideas about soil.		**Observe differences in soils; communicate with scientific words and diagrams.**
A	Gives scientific reasons for why the layers are different.	A	Draws accurate scientific diagrams with labels.
B	Explains how the layers are different.	B	Uses scientific words to describe differences in soils.
C	Describes different soils and lists what is in them.	C	Uses words and diagrams to describe soil.
D	Records simple facts about soil.	D	Answers questions in everyday language.
E	Writes about soil.	E	Draws non-scientific pictures

Figure 6. Example of marking guide – Active assessment

Conclusion

This article is based on observations made during the course of my work as a teacher trainer; it is not part of a formal study. However it was interesting to see how consistent the teaching style was across different classrooms, islands and atolls. In particular, I was surprised at how little influence the Maldives National Curriculum has on what teachers actually teach and test. With a new national curriculum about to be implemented, one is prompted to ask, "Will it make any difference? Will teachers continue to use text books as a de facto curriculum?"

The style of education I have been observing aligns with this description from Tony Wagner (2012):

> *We teach and test things most students have no interest in and will never need, and facts that they can Google and will forget as soon as the test is over.*

It is important for teachers to understand that knowledge is not wisdom; it is only a small part of the curriculum – the easy part - and their job of preparing students for life in the 21st century may be more complex than they realise.

Wagner goes on to set out the challenge for schools:

> *Because knowledge is available on every Internet-connected device, what you know matters far less than what you can do with what you know. The capacity to innovate — the ability to solve problems creatively or bring new possibilities to life — and skills like critical thinking, communication and collaboration are far more important than academic knowledge.*

There is a need for more detailed information about *why* teaching in the Maldives is the way it is and *how* to manage the necessary change process. Where should the focus of reform strategies be placed? Further research is warranted to identify how best to support teachers in rising to the challenge of a new way of working.

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