A summary of the 'Teaching for Understanding' project

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Introduction

The *Teaching for Understanding* project had its origins in 1988 when Howard Gardner, David Perkins and Vito Perrone of Harvard University began discussing the problem, as they saw it, of schools not giving enough attention to understanding. A five-year research and development programme was subsequently mounted with the intention of developing a research-based, classroom-tested approach to teaching for understanding. The multifaceted project involved over 60 teachers in both elementary and high schools and 30 university-based researchers in a variety of studies to examine how best to ensure that students and teachers focused more attention on achieving understanding, how to assess that understanding, and how teachers and students experienced the innovative teaching and learning methods devised during the project. The research was described in *Teaching for Understanding: Linking Research with Practice* (Wiske, 1998), with a companion guide for teachers (Blythe *et al.*, 1998).

David Perkins drew on his extensive knowledge of the literature of cognitive and educational psychology to attempt the difficult task of defining what is meant by 'understanding'. The difficulty of this task can be judged, simply by trying to write down the meaning for yourself. It is an abstract concept which is very difficult to pin down, in spite of it being so widely used in education. The psychological literature in the 1980s was not a great deal of help either, as the focus had been on the necessity for people to form a representation in the mind - a 'runnable mental model' - of the phenomenon they were seeking to understand. This view was based on extensive studies of problem-solving, but its applications for education had not been fully considered at that time. One of Perkins' collaborators at Harvard had, however, reviewed a range of experimental studies in trying to reach a view 'understanding' which would have educational value (Nickerson, 1985). His conclusion was that:

> Understanding is an active process. It requires the connecting of facts, the relating of newly acquired information to what is already known, the weaving of bits of knowledge into an integral and cohesive whole. In short, it requires not only having knowledge but also doing something with it... (Nevertheless) all understanding is tenuous and, in a sense, transitory. We are obliged to understand the world in terms of the concepts and theories of our time... At root, understanding is a true paradox: the more one learns..., the more one ... (becomes) aware of the depth of one's ignorance. (And yet) if understanding is a primary goal of education, an effort to understand understanding would seem to be an obligation, even if ... (it is) only a partially successful effort. (pp. 217, 234,236)

The origins of the interest in teaching for understanding at Harvard can be seen here, and even some of the conceptual origins of the Teaching for Understanding project seem to be anticipated in the requirement "not only (of) having knowledge, but also doing something with it". The notion of understanding within the framework is a performance view - that understanding cannot be directly taught, it is best acquired through repeated opportunities to carry out tasks which demand understanding. Perkins explained this view in the following way.

> Understanding is being able to carry out a variety of actions or 'performances' that show one's grasp of a topic and at the same time advance it... Our 'performance perspective', in brief, says that understanding is a matter of being able to do a variety of thought-demanding things with a topic - like explaining, finding evidence and examples, generalising, analogising, and representing the topic in a new way... It is being able to take knowledge and use it in new ways. (Perkins & Blythe, 1991, p. 6; 1998, p. 13)

From this perspective, understanding occurs through the accumulation of activities focused on understanding. And this guiding principle enabled the research team to generate a framework designed to help teachers to think creatively about encouraging understanding in their students. The framework, which was extensively developed and tested across a wide variety of classrooms, has four main

components, although here an additional aspect has been included for completeness - overarching goals, generative topics, understanding aims, understanding performances, and ongoing assessment.

The starting point for the teacher is to identify *overarching goals* for the course which guide the identification of generative topics. These goals are presented to the students as *throughlines* which help them to see how the topics and themes within the course hang together. Comments from teachers and students illustrate their purpose.

> *Teachers* Throughlines need to capture the essence of whole course ... (and) are often rooted in deeply held but rarely articulated beliefs and values about both the subject matter and the teaching and learning processes... Throughlines can be a valuable teaching tool. They help students see the purposes that underlie their daily work, make connections among various topics and assignments, and track their own developing understandings.

> *Students* (Throughlines on the wall) were helpful. Sometimes I forget stuff, and I could look at them and remember. They get engraved in your memory after they've been up there for such a long time... They helped me get the point. They told me that I'm here in school to know how this connects to my life. (Blythe *et al*., 1998, pp. 41, 43)

The next step is for the teacher is to identify a set of *generative topics* which are;

> issues. themes, concepts, ideas, and so on that provide enough depth, significance, connections, and variety of perspective to support students' development of powerful understandings... Generative topics have several key features: they are central to one or more disciplines or domains. They are interesting ... (and) accessible to students (there are lots of resources available to help students pursue the topic). There are multiple connections between them and students' experiences both in and out of school. And perhaps most important, they are interesting to the teacher. (op. cit., pp. 18, 25)

From these generative topics follow the identification, first, of a series of *understanding aims*, and then of a range of tasks which will demand *understanding performances.* The aims are presented to the students to help them focus on what is required in carrying out the assignments.

> Students need to know where they are headed if we ever want them to be able to get there without our having to do all the driving. (op. cit., p. 39)

Teachers have found it time-consuming and difficult both to think in terms of generative topics and to generate the range of understanding aims associated with each topic and its supporting activities. Some teachers worked as a team and brainstormed their ideas into an *idea web* or concept map which placed the generative topics at the centre, with branches indicating how understanding aims were related to the performances.

> Performances of understanding require students to show their understanding in an observable way. They make students' thinking visible. It is not enough for students' to reshape, expand, extrapolate from, and apply their knowledge in the privacy of their own thoughts... Such an understanding would be untried, possibly fragile, and virtually impossible to assess. (p.63)

Understanding performances have been divided into three kinds - introductory, guided enquiry based on authentic questions, and more complex culminating performances which give students the chance to synthesise their earlier understandings and demonstrate how these interconnect.

Finally, the framework insists that assessment should be *ongoing* or formative, providing students with feedback about their work and also allowing both teacher and students to assess how well students' understanding is developing. Assessment criteria are clearly articulated and closely related to the defined understanding goals and frequent opportunities are provided for feedback which helps students to improve their understanding performances. The students are encouraged to discuss their work among themselves and to revise drafts, culminating with a self-evaluation of the final product. The teacher's role is to provide informal comments as the work progresses, to comment fully on the outcome, and to suggest ways in which it might be improved in the future.

> Try thinking of yourself as a 'floating coach' - keep a general eye on the progress of your students and listen for common questions, sources of confusion, and issues that should be addressed in whole-group discussions. In talking to students, ask

> often for them to explain their answers. Ask them to give reasons for their answers, to offer supporting evidence, and to make predictions in the course of whole-group discussions or written reflections about the performances of understanding.(op. cit., p. 67)

The evaluation of the use of the framework found, as might be expected, very different reactions and interest among teachers. Some teachers rejected the whole idea out of hand, and others found the additional effort it initially imposed too great. Another group recognised the validity of the framework, but felt it offered nothing new - although on reflection that feeling often disappeared, leaving a cautious acceptance.

> Teaching for understanding? What do you think I've been doing all these years?
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> At first I thought, well of course I emphasise understanding. But then I started thinking about all the things I take into consideration when I give grades - effort, neatness, [and so on]... It's surprising how much else besides understanding figures in it. (op. cit., pp. 10, 11)

Those who persevered did, however, come to appreciate its value.

> The framework is a representation of what good teaching is. It captures what good teachers do, so that we can take gut feelings and make them more explicit and visible... All of the key ideas are things I've already known are important for my students. They're things I've always tried to incorporate in my teaching. But it's hard to keep track of all those pieces all the time. Using the framework as a lens to look at my teaching gives me a systematic way of making sure I'm consistently integrating all of the important elements... (op. cit., pp. 22, 23)

Where the approach was fully understood and wholeheartedly embraced by the teacher, students' reactions were generally positive.

> This kind of learning is very different - not like straight information with right and wrong answers to things. This is loose, in a way, but it helps by centering us around something like a theme... You can relate back to the theme. You can connect things to it... If I can get the whole - take all the information and put it all together - then I understand... Self-assessment has helped me figure out how I'm doing... It is important to know what you know compared to what the teacher thinks. (op. cit., pp. 13, 29, 81)

Limitations of the performance view of understanding

In my reading of the publications from the project, there seem to be two significant omissions from the framework. Firstly, the emphasis is on how the subject matter is organised by the teacher and presented to the students, with very little being said about the interactions which take place between the teacher and the class. Secondly, there is also a failure to acknowledge that substantial personal understanding cannot be guaranteed just by taking part in understanding performances. Students differ profoundly in how well prepared they are to recognise the way the different assignments hang together in contributing to a better grasp of the content area. The combination of the opportunities for developing understanding designed into the curriculum and the way the teaching and learning materials are presented (method and climate) will together affect the quality of understanding.