Building conceptual understanding…using 'maths in context' teaching approaches

The experience of the presenters, Heather Aspinwall & Geraldine Kendall, includes subject learning coaching, involvement in the GCSE MEP and working with Manchester Metropolitan University on Realistic Maths and MEI – Maths in Context.

An example of an exam question from the 1990s was recalled. This involved 10 cm buttons spaced around the hem of a skirt. A student ignored the question because the context was not seen as a 'male' question. From this it was suggested that context needs to be inclusive.

Illustrations of some uses of knowledge acquired at school were collected. These included:

- a list of everyday issues [bills, shopping];
- that context can be tricky if not personally experienced;
- awareness that learners can be conscious of issues even if not directly related;
- how 1969 school French came in handy much later in life.

Overall it was noted that you don't know what will be needed in the future.

Feedback from Realistic Maths showed that the Percentage Bar and Ratio Table were well received.

A number of examples were discussed in detail.

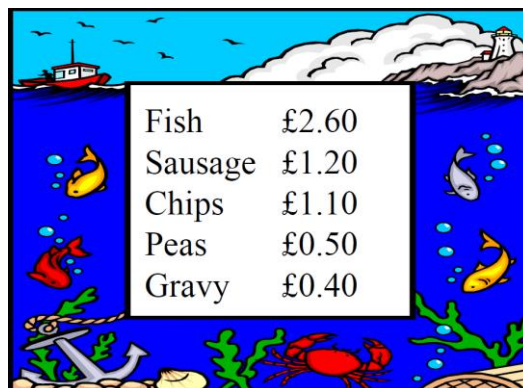**Example 1 Algebra – Equation solving**

By asking questions such as

"I think of a number, multiply by 2 and add 3. My answer is 11. What is the number?"

working backwards is needed. Students build up their skills and then generalise.

Learners use different ways to generalise and record. For recording, square boxes were used, question marks were common, but there were also those who used x.

Later in the year, algebra and "undoing" was noted in student work.

Example 2 Algebra 'At the chip shop'

Fish	£2.60
Sausage	£1.20
Chips	£1.10
Peas	£0.50
Gravy	£0.40

Here the costs of orders in a fish and chip shop were used to illustrate common algebraic processes. Initial letters were used as shorthand for the **cost** of an item e.g. *f* was used to represent the **cost** of a portion of fish. Care needs to be taken to make it clear that the letter represent a number and not a piece of fish.

- 3 fish and chips can be written in [at least] two ways.
- Orders over the phone were often written as $3(f+c) + 4(s+p) + 1c + 2p + 2(f + p)$.

- The equivalence to 5f + 4s + 4c + 8p was discussed in a natural way.
- This was then developed when orders are cancelled in cancelling e.g. what is the meaning of 3(f + c) – (f + c)?

It was proposed that memory is aided by this activity.

Example 3 Ratio tables as a way of extending the number line.

Mark is 5 feet 3 inches tall, Alexander is 1 metre 72 cm tall. Using the ratio 30 cm is equivalent to 12 inches (perhaps read off a ruler), decide which is the taller of the two.

Cm	30	150	15	7.5	???
In	12	60	6	3	63

Finally there was a discussion around context drawn from Realistic Mathematics Education. It was noted that authentic contexts were preferred over pseudo contexts, although it is not necessarily bad to use pseudo contexts. The focus should not only be on moving from mathematics to context but in the opposite direction too.

The speakers were thanked for an interesting and thought provoking presentation.