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What mathematics do adults REALLY do in everyday life?



In the 1990s teachers are continually asked to justify what they teach, especially in mathematics, especially in primary schools. 'What do schools need to teach that for?' is a common cry from students, parents and teachers alike. It is a fair question and demands a realistic answer.

So, what I suppose I'm saying is the more mathematics you learn at school, the easier it is to do the day to day calculations which you're going to have to do all your life long.

Do you consider maths to be useful in your personal life?

Yes, I use it all the time. Can't imagine being without it.

It's essential too, I think, to everyday living, all your life long, to be able to have a certain knowledge of figures.

What is the SAUCER Project?

The Saucer (So Adults Use Calculations Everyday Research) Project was designed to find out what types of mathematical calculations adults do in their ordinary lives. To find answers to this question we surveyed a variety of adults across a range of ages, occupations and backgrounds.

Research of this type hadn't been fully carried out since Wandt and Brown's study in 1957, so up-to-date data collected in a local environment was needed.

How was the research collected?

Between February and September 1998 around 200 volunteers were surveyed and asked to record the mathematical calculations they completed in a typical 24 hour period. The volunteers ranged from recent school leavers to aged

**What mathematics
should we really be
teaching? What maths
do adults really do in
everyday life?**

MARIA NORTHCOTE and

ALISTAIR McINTOSH

**describe the recent
SAUCER Project at
Edith Cowan University,
which was designed to
answer these questions.**

pensioners and included university lecturers, postal workers, nurses and clerks.

For each calculation, volunteers were asked to record details such as:

- their location (e.g. shop, kitchen, car);
- whether an estimate or exact answer required;
- level of difficulty (e.g. primary, secondary, tertiary);
- purpose (e.g. banking, travel, leisure); type (e.g. money, time, mass);
- mathematics operation used; and
- time of day.

Seven of the volunteers were then interviewed in more depth to explore how some of the calculations were actually completed as well as the volunteers' attitudes to mathematics, both past and present.

The results of the survey were recorded on a database and the interviews were transcribed. This made for easy analysis and comparison of expected and unexpected categories of results.

The results

Mainly mental, mainly estimation

84.6% of all calculations involved some form of mental mathematics, compared to written mathematics (11.1%), calculator use (6.8%) or use of other physical objects (19.6%). The percentages total more than 100 because more than one method was combined in some calculations. The fact that mental mathematics dominated the other categories is not surprising but the extent to which mental mathematics dominated was striking.

Almost 60% of all calculations required only an estimate compared with 40% in which an exact answer was needed.

Never enough time

As most adults know, juggling time is an ongoing issue in ordinary life. The research showed that the calculation of time was the most common purpose of most calculations. In fact, 24.9% of all calculations recorded in this research involved time.

Gone shopping

The purpose of 22.9% of all calculations was shopping, making it the second most common type of calculation.

I suppose when you're out shopping you're doing calculations as well.

Yes, sometimes you think you've got more money and you look in your purse and you think 'Oh, God, I've only got that much and I'm going to get this, that and the other.' So I do a quick mental arithmetic then. Not particularly accurate to the cent but just to calculate that I won't be left lamenting at the checkout. That sort of thing... that's maths of course.

Home or away?

Out of all the calculations recorded for this research, 47.9% of them were completed inside the home. Other venues included shops (18%), cars (9.1 %) and entertainment venues (4.6%).

Add, take, multiply or divide?

Addition (45.7%) and subtraction (42.5%) were the most common operations used. In fact it appeared that over two thirds of the calculations reported were at a level within the range of an average Year 4 child and almost all the remainder would have been learned by the end of the primary school.

Attitudes to mathematics

When volunteers were asked about their past and present attitudes to mathematics, they were markedly similar. Those who had positive school memories of mathematics lessons, teachers and activities retained a positive attitude to the subject in adulthood. Similarly, adults with negative attitudes linked the cause of this to negative school experiences. In these cases, the volunteers were seen to actually avoid situations where mathematics occurred. One volunteer explained:

My mother-in-law always hated maths and she's always sent her kids to the shops, for that reason.

...over two thirds of the calculations reported were at a level within the range of an average Year 4 child...

Whether or not the volunteers felt competent to complete mathematics calculations in their everyday lives seemed quite dependent on the success or failure, perceived or otherwise, they experienced at school:

I wasn't very good at it and that's why I didn't enjoy it. I found it very confusing. Not until I actually started using things like coins and money and using it... 'I don't use maths'

Another comment that many volunteers made was that they did not think they used mathematics very often.

And would you consider generally maths to be fairly helpful for you in your day to day life?

Yeah.

You rely on it a fair bit?

Without thinking about it. But now that I've done this (survey), yes, I realise that you do use it quite a lot but I wouldn't have thought that I did.

Practical mathematics works

Mathematics teachers are aware of the value of practical activities. This research project not only confirms this theory but suggests that mathematics learned in this way has a 'long life expectancy'. The following comment, representative of the opinion of many volunteers, supports this view:

... when you're actually using it in every day life, like money, adding up, taking away. It just became quite easy. Whereas I always found it very hard on paper.

Problem solving works, too

Problem solving was mentioned a number of times in relation to the enjoyment of mathematics.

... I remember when I started, the solving of the problem was often attractive but I always found it a bit too much.

I always enjoyed problem solving.

I suppose I enjoy problem solving type activities in maths. Just because it doesn't seem like maths.

Implications for the classroom

While producing some very interesting results, the main purpose of this research was to impact at the classroom level by providing evidence of what really happens in real life mathematics.

The following points will hopefully be useful for mathematics teachers:

- mental computation is going to be a far more critical skill for most adults than written computation;
- estimations are more often needed than exact answers;
- a positive attitude to mathematics enhances long term retention of mathematics learning;
- incorporate practical activities, especially involving time and money, as much as possible;
- plan activities in which students are required to use more than one operation;
- continue to provide practice in simple mental calculations in the upper primary years and beyond;
- above all, make your students aware they are going to use the skills they are acquiring in the primary school every day as adults.

References

Wandt, E., & Brown, G. W. (1957). Non-occupational uses of mathematics. *Arithmetic Teacher*, 4, 151-154.

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