

# Mathematics in hair and beauty: Staying in business

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*The Hairdressing and Beauty therapy courses at Manukau Institute of Technology attract many students from diverse backgrounds, especially school leavers. Today's classes are made up of international students, degree holders, and students whose previous educational experiences have left them with a somewhat negative approach towards anything associated with mathematics.*

*From 2001 to 2004, the Learning Centre worked in collaboration with the Hair & Beauty department to provide customised interactive maths workshops (non-assessed) for students enrolled in their programmes. These interactive workshops were designed; to assist students to meet the course requirements of the department, to apply theory in practice, to overcome negative attitude towards maths and to be able to develop a confident approach to vocational numeracy.*

*However at the end of 2003, the Hair and Beauty department removed the Maths content (Unit Standard – assessed) from the programme in order to include more Hair and Beauty curriculum. Nevertheless customised interactive maths workshops continued to be requested as the staff recognised the importance of continuing to develop student's maths skills. One outcome in 2004 was that workshops became more visual and interactive.*

**Manukau Institute of Technology (MIT)** established in 1970, is one of New Zealand's leading education and training institutions, and is a degree-granting institute of technology. MIT is located in the city of Manukau (Maori name is He Taonga Hiranga Whakanui Whanau -"a gift to portray the importance of family"), population 300,000 and with over 160 different ethnic groups. The diversity of our students and often their lack of any formal academic experience mean that these students benefit from additional academic support such as Learning Centre, Language Support Centre, and Library.

**The Learning Centre (Te Pokapu Ako Tauria)** is one of the student academic support services within MIT. The centre is in the unique position of interfacing directly with students from across the institute and the team works collaboratively with other departments. This means that members of the team have the role of liaison advisor to each department at MIT to provide suitable learning advice for their students. The team collaborates with students and academic staff within MIT to customise one on one, small group and workshop sessions.

**The School of Hair and Beauty** is accredited to teach the City and Guilds international hairdressing and beauty therapy qualification, as well as New Zealand nationally recognised certificates. The courses offered are shown in Table 1.

**Table 1. Range of Programmes Offered**

<i>Hairdressing Programmes</i>	<i>Beauty Therapy Programmes</i>
<i>Certificate for Salon Assistants</i>	<i>Certificate for Beauty Assistants</i>
<i>Certificate in Barbering</i>	<i>Certificate in Beauty Therapy</i>
<i>Certificate in Hairdressing</i>	<i>Certificate in Spa and Body Therapy</i>

These programmes come under the New Zealand Qualification Authority (NZQA) umbrella. NZQA provides quality assured leadership in international qualifications and coordinates national qualifications within New Zealand. The National Qualification Framework (NQF) is designed to provide nationally recognised standards and qualifications, as well as recognition and credit for a wide range of knowledge and skills. Unit standards are registered on the NQF.

There are different entry requirements for the Hair and Beauty qualifications. Most qualifications require minimum of 3 years of secondary educations if the student is under 20 years of age. Table 2 shows the age range of students entering the various courses in 2004.

**Table 2. Age Distribution by Programme in 2004**

Programme	Age						Total
	Less 20	20-30	30-40	40-50	50 & over		
<i>Cert in Barbering</i>	7 (36.8%)	3 (15.8%)	2 (10.5%)	6 (31.6%)	1 (5.3%)		19
<i>Cert in Beauty Assistants</i>	18 (52.9%)	10 (29.5%)	5 (14.7%)	1 (2.9%)	0 (0%)		34
<i>Cert in Beauty Therapy</i>	5 (22.7%)	10 (45.5%)	5 (22.7%)	1 (4.5%)	1 (4.5%)		22
<i>Cert in Hairdressing</i>	47 (58.8%)	20 (25%)	12 (15%)	1 (1.2%)	0 (0%)		80
<i>Cert in Spa and Body therapy</i>	2 (25%)	0 (0%)	1 (12.5%)	5 (62.5%)	0 (0%)		8
<b>Total</b>	<b>79 (49%)</b>	<b>43 (26%)</b>	<b>25 (15%)</b>	<b>14 (9%)</b>	<b>2 (1%)</b>		<b>163</b>

**(JASPER PRODUCTION<sup>20</sup>, Manukau Institute of Technology)**

The hairdressing and beauty assistance courses attract more school leavers than the beauty therapy and spa & body therapy courses. Additional statistics show that the over 90% of the students were female.

These programmes attract many students from diverse backgrounds such as school leavers, degree holders and international students. Some of the students are people well beyond schooldays, full of a mixture of regret, determination, but dogged by lack of confidence and self-belief, facing problems of time and space to study (Rogers, 2002). These programmes attract a higher percentage of European students as opposed to other ethnic groups. The range of ethnicity is shown in Table 3.

**Table 3. Ethnicity of School Leavers by Programme in 2004**

Programme	Ethnicity								Total
	Maori	Fiji	Samoa	India	China	Other Asia	Other	Euro	
Hairdressing Technical & Further Education	1	0	0	0	0	0	0	11	12
Cert in Hairdressing	7	1	2	1	1	1	1	14	28
Cert for Beauty Assistants	2	1	2	0	0	0	0	5	10
Cert in Beauty Therapy	1	0	0	0	0	0	0	3	4
Cert in Barbering	1	0	1	0	0	0	1	1	4
Cert in Spa and Body Therapy	0	0	0	0	0	0	0	1	1
<b>Total</b>	<b>12 (20%)</b>	<b>2 (3%)</b>	<b>5 (9%)</b>	<b>1 (2%)</b>	<b>1 (2%)</b>	<b>1 (2%)</b>	<b>2 (3%)</b>	<b>35 (59%)</b>	<b>59</b>

**(JASPER PRODUCTION, Manukau Institute of Technology)**

The purpose of this paper is to discuss these main aspects:

- Students' negative attitude towards maths
- Collaboration between departments
- Interactive Approach: How does this create better learning outcomes?

<sup>20</sup> JASPER Production – Jade student management system used at the Manukau Institute of Technology

- Melding theory into practice

## Overview

The Learning Centre worked in collaboration with the Hair and Beauty department to provide customised interactive maths workshops for students enrolled in the Hair and Beauty programmes. These interactive workshops were designed to support students in the application of theory into practice; to overcome negative attitude towards maths and be able develop a confident approach towards vocational numeracy.

In 2003, a review of the content and delivery of the Learning Centre maths workshops was conducted by myself and two lecturers on the Hair and Beauty programme. This was largely due to student feedback received. One student in particular commented that they thought the interactive workshop was valuable; however the resources and delivery could be more contextualised and visually based. From this reviewing process, we identified the underpinning numeracy skills required and discussed the possibilities of developing more visually based resources to assist students within the Hair & Beauty programmes. We discussed how the integrated workshop could be made to work more effectively and the possible value of this approach in improving learning and practical outcomes. The results of our review led to re-establishing the approach for numeracy training and continuing interactive maths workshops run by the Learning Centre that began in 2001.

I thought that re-establishing the approach of numeracy training would be beneficial to students of Hair and Beauty, as they seem to more readily engage in interactive workshops rather than to traditional lecture style (chalk and talk). My perspective was reinforced by Sanguinetti & Hartley (2000) who reviewed 'A synthesis of recent research into the effects of integrating literacy and numeracy into training packages' in which they found numerous recommendations from practitioners and researchers in Adult Literacy and Numeracy Australian Research Consortium (ALNARC). Some examples of recommendations are:

... making numeracy more visible and more explicit [increase visibility]...; more exemplars of good practice in specific industry settings to be developed and discriminated; ... [research] need to be conducted regarding the strengths and weakness of two main approaches; the implicit (built-in) and the explicit (bolted-on) approaches could be more effectively integrated with each other. ... Re-naming training packages to more accurately reflect their purpose. (Sanguinetti & Hartley, 2000, p. 6-11)

Using these ideas and working in collaboration with Hair & Beauty staff, we decided to re-develop the existing package and re-name the workshop to 'Staying in Business' (SIB).

## Issues

### Programme Issues

The Hair and Beauty unit standard 64: Perform calculations for the workplace (2 credits at level 1 on the NQF) was reviewed, and reissued by NZQA Hairdressing Industry Training Organisation (HITO) in August 2003. At this time, HITO removed this unit standard, as it was no longer considered relevant. However, due to the success of the interactive maths workshops for the Hair and Beauty programmes, the department requested the Learning Centre to continue.

### Student Issues

From my observation being a mathematics learning specialist, students see mathematics as a subject and as something different from practical daily mathematics. When mathematics/numeracy is used in a workplace, student review it as 'just part of the job' and it is also perceived as 'just common sense'.

Hairdressers, beauty assistants, beauty therapists, and barbers all have different entry requirements. Some students have only completed three years of secondary education involving mathematics while other students may have completed mathematics in a degree programme. Many students have also had previous educational experiences which have left them with a somewhat negative attitude towards anything associated with mathematics. Mathematics workshops therefore need to be well thought-out to cater for mathematics related needs within such diverse groups. Workshops need to be designed and contextualised to meet specific learning situations.

Recording observations made by the students over the last 3 years, I have noted the most common mathematics phobia statements; 'I hate maths', 'I was never good at maths', 'I never used the maths that I learnt at school', 'I

never understood maths' and 'I chose this course because I thought that there wouldn't be any maths in it'. Many of the students with negative attitude towards mathematics may have developed a phobia.

Hodgson (2004) lists reactions to mathematics stating that 'maths phobics' will often:

- lose confidence in themselves and in their academic abilities
- trust blindly any bills they receive, because they aren't question the figures
- shy away from helping their kids with their homework
- avoid courses in case they contain maths
- leave courses when they encounter the maths element
- run up credit card bills as they can't keep track of how much they've spent

All with which I concur. She goes on to say;

Many people have subconscious fear of Maths. They appear to be okay with the real life situation such as money handling. However when the numbers are written down on the paper then they seem to be doubtful as to if they can solve the problem. There is not a 'type' of student that has a problem with maths; it could be anyone. ... The main problem seems to be understanding that, for the most part, it is fear that stops people, and not a lack of mathematical skills (Hodgson, 2004, p.2).

The reactions of students to mathematics as identified by Hodgson (2004) have been evident within Hair and Beauty students during the course of the programme. These observations counted towards the development of the SIB workshop series.

Every student is different in terms of how they learn and perceive mathematics. The general feeling from the students at the start of the workshop series is high uncertainty. They are often afraid to ask questions. My own observation of this is that there are varieties of reasons why they lack confidence in mathematics. As shown in the previous table of age distribution by programme that many students have not studied for a number of years; others have had negative learning experiences.

According to the Visual Aural Read/write Kinaesthetic (VARK) learning styles inventory (Fleming, 2001) conducted by the Learning Centre on these students, most of the Hair and Beauty students are visual or kinaesthetic (hands-on) learners. An environment where students are involved with practical hands-on experiences therefore becomes critical.

## Methods/approaches

### Interactive approach / Melding theory into practice

By the end of the 2003, the Learning Centre working in collaboration with the Hair and Beauty staff had enhanced the customised interactive workshop effectiveness. The title of 'maths workshop' has changed to 'Staying in Business' (SIB), which runs two hours per week for 4 weeks. This workshop is to support the students with numeracy training and is not part of the credit on its own but its content is contributed towards the assessment.

Interactive methods include:

- Domino card games  
These cards, when played with by students, assist in the development and extension of the four operations. This task is done in groups of three to four requiring students to perform a mathematical process in order to complete.
- Discount vouchers  
Vouchers are a visual resource available for student to use during the invoice segment of the workshop to solve problems involving discounts. I encourage students to work in pairs whereby the voucher is to be used to reinforce calculating discounts and create a role-play situation.
- Hair and Beauty invoices  
These invoices are completed in the third session using the a commercial haircare product price list. By using an actual price list, students get to experience a real life situation.

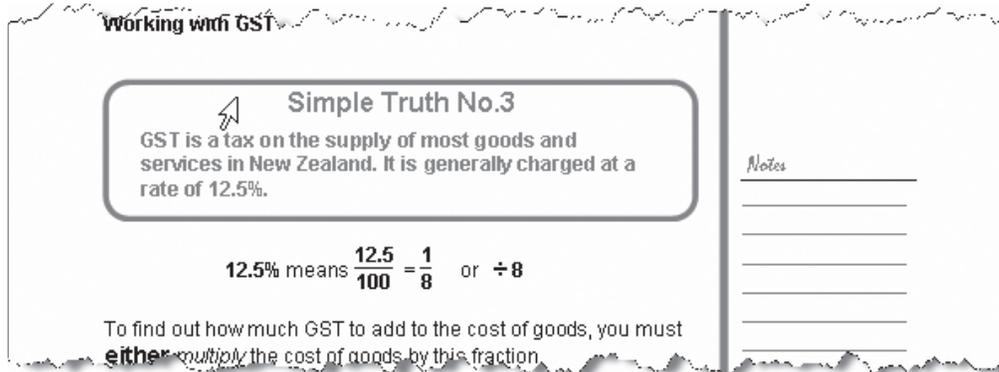
- Contextualised examples - salon situations

A number of context related examples are presented to students throughout the workshop, such as real salon scenarios with actual prices and products descriptions, for students to use to problem solve.

The new formatting and layout for the worksheets include;

- integrating note-taking strategy

The Learning Centre developed a note-taking strategy which I felt would integrate nicely with the SIB worksheets. Students can then add their own notes to the worksheets.



- formulas and facts in 'simple truth' boxes

Students have to learn several formulas and facts during numeracy training. Incorporating the 'simple truth box' to emphasise the formulas and facts encourages the retention of important information. Working examples of each formula or fact follow directly after each 'simple truth'.



- providing visual tools for workshop use

These tools assist visual and kinaesthetic learners to engage with the topic. One such example is the discount vouchers which can be used by students during the invoicing and discount session. It is also common for actual products to be displayed and utilised during various sessions to provide these learners with real life examples.



In the SIB workshop, the Learning Centre specialist focuses on the worksheets in the first hour to develop students' confidence in vocational numeracy. Directly after this session, Hair and Beauty lecturers follow up with hands-on practice incorporating strategies and skills learned with paper money, register tills, price guns, invoices, and with mixing and measuring the chemicals and products.

The intention with this collaborative approach was to make the mathematics practical, applicable, achievable, and fun for the students.

## Results

- The Hair and Beauty school incorporated the 'Staying in Business' content into their course assessment to measure the students' knowledge.
- The continuance of 'Staying in Business' workshops has brought positive feedback regarding the improvement in students' attitude towards mathematics.

### Student Feedback

This feedback was from student evaluations of my teaching for effective learning and my overall performance. I have included some positive feedback of the workshop content and resources from these evaluations.

Good examples and I can relate to it now.

Love the handouts/worksheets makes it easier to follow and understand the calculations

Everything we learnt was helpful

Understanding things better, e.g. GST etc.

Card games – was fun and that really helped us.

- There has been an increase in self-confidence of the students through interactive learning methods and appropriate worksheets.
- Visible improvement in student practice in the salon – confidence in vocational numeracy, e.g. use of pricing guns, tills, diluting solutions.

Increased interactive learning methods resulted in increased student self-confidence in Mathematics. This was brought about by the high interaction between the students in class because they needed to communicate with each other to process and answer questions. Students themselves reported a positive change in attitude toward mathematics.

## Conclusion

In collaboration with Hair and Beauty staff, the Learning Centre has facilitated interactive mathematics workshops to assist students to meet the course requirements of the department. In particular, the application of theory into practice, overcoming of negative attitude towards mathematics and the development of confident approaches towards vocational numeracy. Student assessment and feedback have shown that these new approaches have suited their needs and goals of the Learning Centre and Hair & Beauty staff have been achieved. Increase in student confidence towards numeracy training exceeded expectation. Melding theory into practice and contextualising the content of the course into practical components has also resulted in positive outcomes for both students and staff.

### Implications for Further Practice in Other Courses/Programmes

- Make the content and methods more relevant, as contextualised as possible.
- Try new approaches in formatting and layout to reflect the nature of the course/programme.
- Encourage collaboration with students, support services and content.
- Practice with feedback makes perfect.

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