Design and Implementation of Vocational Education at Brisbane Boys' College

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Abstract: This paper outlines the design reasons and implementation process over four years of Trade and Business Mathematics (VET[1] subject) at Brisbane Boys' College - a private boys' school. The subject was implemented to help provide for a core group of students who were otherwise not sufficiently catered for in the general education stream. The paper follows both the development of the subject as offered, and the progress and career-outcomes of the first cohort of students to pass through the course and for two years following completion of the course. This will further provide the school with information regarding the relevance of learning to the required outcomes, the relevance of training undertaken at school and the integration of their learning into their career choices. Students were also surveyed in regard to expectations and perceptions of the course (both before and after completion). Results of this study are being applied to further tailoring of the courses offered to Vocational Education students at BBC.

Background

Brisbane Boys' College (BBC) is one of the leading academic private boys' schools in Queensland. The school has an emphasis on academic excellence, and most students graduate to tertiary studies and enter high-level performance careers.

Traditionally there have been few pathways for students not intending to continue on to tertiary-based careers. The vocational education course was implemented to help provide for these students, the bulk of whom had experienced repeated failure in the mainstream courses they had studied in the first ten years of their education. For example, of the first cohort of thirteen students to attempt the VET course at BBC, 8 had failed Year 10 Maths (according to standard academic indicators in use), compared with 9 out of the same group of 13 passing Maths by the end of Year 12[2]. Whilst some of this success can be put down to a change in the level of mathematics attempted, much of the success should be recognised as a direct result of the change in the learning process used by these students.

This course was designed predominantly to prepare students for work, apprenticeships, traineeships, and further study with TAFE[3] and/or private providers. Whilst this course was not designed for students who envisage university as their first destination after Year 12, university study is still an option for vocational education students following completion of apprenticeships and/or other training.

At the end of the course, the students exit with a Senior Certificate, and an optional Core Skills result (a state-based university entrance rating), as would any other student in the school. Additionally, the students in the VET course receive a statement of completed national industry modules, and a list of completed industry Certificates (potentially up to 5 completed to AQF[4] Level 2).

Example: A student studying Trade and Business Mathematics (a Board Registered Subject[5]) has the option of achieving either a Certificate I or Certificate II in Trade and Business Mathematics, as well as receiving a Level of Achievement from the school.

Industry Training

In general, students select a specific vocational interest area (e.g. boat building) and find a provider (e.g. TAFE) who offers off-the-job (i.e. technical/theoretical) industry training in this area. They are released one or two afternoons per week to attend this training. At the end of each Semester in Year 11, students are block released for 2 or 3 weeks for on-the-job training with an employer. Students in Year 12 are placed for one day per week throughout the entire year with an employer, to receive continued on-the-job-training.

This industry placement is organised to reflect the off-the-job training done during the week (e.g. A student studying Horticulture at TAFE might be placed with a golf-course, to gain work experience in green-keeping.).

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[1] VET - Vocational Education and Training

[2] Australian students complete Years 1-12 in school, before moving onto university or other tertiary studies.

[3] TAFE - Technical and Further Education.

[4] AQF – Australian Quality Factor, a Nationally endorsed and recognised standard.

[5] Board Registered Subjects are subjects that are registered with the State Education Board in Queensland, but are administered by the school themselves, without external processes. These subjects do not contribute to a students' OP score.

Whilst at school, students continue to study, in some form of subject-based, self-paced work. They still follow a timetable akin to an academic student timetable, but are able, in most of their subject areas, to continue their learning at their own pace. This design allows for and encourages a non-formal classroom setting, where students can be active participants in their learning when they are present, but are not unduly penalised for their (frequent) absences due to training at other campuses or with an employer. This allows a student to progress at his own rate of learning (with motivation and encouragement from teaching staff to keep the student at some reasonable pace). This necessitates the minimisation of the use of the traditional blackboard approach to teaching, since is it perceivable, and is often the case after just a few months in Year 11, that most students are working on different areas of study, depending on their goals (especially in regard to their goal of Certificate I versus Certificate II outcomes). Thus the role of the teacher becomes more that of a tutor to each student: being a learning aid for the student to access when required.

VET Subjects

Students can study a range of subjects, from one VET subject (and five OP[6]-academic subjects), through to a 'pure' VET stream, of six subjects. Board Registered Subjects at BBC with embedded Vocational Educational and Training outcomes include:

- English Communication
- Trade and Business Mathematics
- Computer Studies
- Physical Recreation
- Enterprise Studies (School Subject)
- Technical Studies (Board Subject) [not offered until 1999]
- Industrial Skills [not offered until 1999]

Students who are part of this course (and are non-OP students) can still achieve relevant outcomes, such as individualised learning outcomes, nationally accredited certification, traineeships and apprenticeships, equivalent Rank Score (maximum OP equivalent to 6) and access to TAFE/university/pathways open to OP students.

Example: One student who received a Low Achievement for Year 10 Mathematics (Core) eventually completed the course in Trade and Business Mathematics, with an overall LOA[7] of an High Achievement. He has since gained a clearer idea of his career goals, has completed an International Business Diploma, and is currently studying for a Degree in Commerce at university.

Trade and Business Maths Course Content

In Trade and Business Mathematics, students work through a series of modules over a two-year period. Completion of a certain number and range of modules makes the student eligible for either a Certificate I or II. These can be divided into two areas, Core and Optional modules. There are six core (nationally endorsed) vocational modules including areas such as: Fractions and Decimals; Ratio, Proportion and Percent; Measurement and Mensuration; Introduction to Geometry; Earning and Spending Money; and Simple and Compound Interest.

Students successfully demonstrating competency in each of these embedded modules will achieve a Certificate I in Trade and Business Mathematics (recorded on the Senior Certificate as well as the relevant level of achievement).

There is also optional material, including a further six nationally endorsed vocational modules (of which students need to complete four to gain Certificate II). They include areas such as: Geometry of Triangles and Quadrilaterals; Geometry of Circles; Introduction to Algebra; Transposing and Evaluating Formulae; Introduction to Trigonometry; and Descriptive Statistics.

Implementation and Resourcing

The actual implementation of the subject was a challenge to the teaching staff in many respects, since staff approach to teaching and teaching resources had to undergo a somewhat dramatic change. Problems associated with implementation were mostly in three broad areas – resources, teaching style and student participation.

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[6] OP - Overall Position score, part of the pre-University ranking system used in Queensland.

[7] LOA - level of achievement

For most of the subjects in the initial implementation, only trial syllabuses existed. Given that these were pre-dominantly new subject areas, few resources existed in any organised, central manner that were specifically aimed at, or designed for, the subjects. For Trade and Business Mathematics, an entire text had to be written and organised, so that each module could be presented to students as a stand-alone topic (some with pre-requisites). Each module booklet included:

- all text-related theory required for the module,
- worked examples,
- questions and solutions,
- a list of the learning outcomes and assessment criteria for the module, and
- a practice test (of a similar format and standard to the competency-based test that the students sit).

Effectively, twelve modules had a mini-text written from scratch for them, all in the same format and layout, along with another five school-based modules to cover any core areas of knowledge not covered by the nationally endorsed modules. (A total of approximately 270 A4 pages and 70 000 words.)

Teaching style was also an issue for all staff involved, since the model the VET course at BBC was attempting to pursue was one of pre-dominantly self-paced learning, with the teacher able to act almost as a tutor and mentor rather than a formal teacher. This necessitated the change from mainly board-based teaching ("chalk and talk") to a scenario where students were able to continue their own work, accessing help whenever required. Teachers then had to set up their courses and resources so students could pursue their own learning.

Similarly, in terms of student participation, there was an enormous change in mindset for the students to overcome. They had previously experienced ten years of largely passive learning in school, of being able to sit back in class, and be taught, copy notes from the board, copy examples, then attend to work set for them. In the VET course, the requirement of self-paced learning demanded that the student be able to enter a classroom, pick-up where they had left off last time in that subject, and continue on *without* prompting from a teacher. Students were made aware of course requirements in terms of amounts of material needed to be covered per term[8]/semester, and were steered in the direction of appropriate time frames to achieve these goals. Feed back from some past students suggested that this is one area that could possibly be formalised and administered a little more firmly, especially in Year 11, to help them make the transition from a 'standard' classroom in Year 10, to a self-paced one in the VET course. Currently undergoing a trial (in one subject) is a system where students are given a fairly detailed breakdown of the course requirements for the current term (for a student attempting to achieve Certificate II), which includes details of the theory they should cover each week, appropriate exercises to attempt, when to attempt practice exams, and time to fit in assignments around their other commitments.

As noted earlier in this report, the majority of students in the first intake of the VET course had experienced repeated failure in earlier years of mathematics. As students progressed through the Trade and Business Maths course at BBC, many of the students began to achieve success. This is probably a result of two main areas of influence: firstly the work was given to them in manageable sizes, and secondly, the work being covered seemed relevant to them.

1. The structure of the course on offer at BBC allows for each module to be assessed as a single topic, with most modules able to be completed in periods of less than four weeks rather than being extended over a period of months. The fact that there is a practice test of similar material, and a list of known outcomes, often helps the student to be more settled, and to feel that the material is of a more attainable standard.
2. The second major reason (which former students have nominated as being one of the main sources of success for them) was that the material seemed relevant to them. The use of mathematics in trade-based examples and trade or other real-world contexts allowed students to see how the mathematics could function for them, and for it to be a tool that they could (or would) use in the course of their future employment or training.

Survey Results

[8] A *term* is a half semester, and there are two semesters per academic year.

A survey of the thirteen 13 students in the first cohort through the VET course at BBC generally showed expected outcomes. Twelve of the 13 students were available. The results shown summarise some of the findings.

Continued on to:	
Apprenticeship	6
Traineeship & related work	2
Related work	3
Study	1
Not working/studying	-

Usefulness and relevance of: (rated 1-5 for Poor through to Very Good)													
Usefulness of VET course	4	4	3	3	3	5	5	3	5	3	3	4	3.8
Usefulness of self-paced learning	4	2	5	2	4	3	4	4	4	4	1	5	3.5
Relevance of Maths content	3	3	2	2	3	4	4	5	4	5	2	4	3.4
Relevance of work experience	5	2	1	5	5	4	5	3	5	5	4	5	4.1

Expectations & perceptions – prior to doing VET course:

- More advantages, especially with future job prospects
- Probably wouldn't cope with full OP course
- Would be more 'hands-on' than OP course
- Would involve TAFE and other practical studies
- Would involve work experience and placement
- Would be related to likely career choices
- Would be less pressure academically, with different teaching styles and expectations of students, including self-paced learning
- Would better equip them for life after school

Perceptions of the course 18 months post-graduation:

- All surveyed agreed that their expectations for the course were well met.
- All agreed that the course related very well to their career choices, and gave them skills that set them ahead of other job seekers.
- Most agreed that the work placement they did was a very positive experience, with eight of the former students actually ending up doing apprenticeships or working for the business they were placed with for their work experience.
- Seven of the former students recognised their ongoing use of maths in their jobs, with only three commenting that they had to learn some new maths skills for their job.

Parents of former students were informally surveyed at the same time (for general comments):

- All agreed strongly that the experience of the VET course had been a positive one for their son.
- Most stated that the course had greatly improved their sons' employability.
- All agreed that the course had on the whole met their expectations.

Conclusion

Feedback from various sources over the last two years has allowed a number of areas of the course to be improved upon, and changes are continually being discussed and acted on. More subjects are now offered, which are more hands-on for students. More opportunities are available for work placement, with students now able (in the second year of the course) to have a job placement in industry once or twice a week all year. Trades-people from industry are being used more often on campus to talk with students, both for encouragement purposes (reinforcing that they are on the right track) and for demonstrating and confirming the use and relevance of school-learnt skills. Great care is being taken that work placements are relevant (vocationally) for the students, and not just selected because it is something that their mates are doing, or which is easily available. In general it seems that if a student can get work-placement that is related to their career goals, then the learning that they are required to do at school becomes more relevant to them in a vocational sense. The current generation of student, particularly those seeking vocational employment post-school, have an attitude that they are best served by learning only that which is required to attain a specific result (relevant to them as an individual). A primary goal of educators in VET courses then should be to ensure that all training and learning be as vocationally relevant as possible, and it is with this goal in mind that we continue to improve and hone the VET course at Brisbane Boys' College.