

We are practical people – Building new initiatives to improve student success in level 2, 3 and 4 programmes

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Abstract

The workplace is evolving and education needs to keep abreast of industry requirements. Preparing students for the workplace involves more than helping them to acquire academic or trade qualifications; employers also value graduates who can work as part of a team, manage their time and follow instructions. With the advance of technology, computer skills are becoming more important and students need to feel confident and competent in electronic usage. This paper describes the contribution of tutors and learning support staff working in automotive programmes at the Bay of Plenty Polytechnic. It looks at how each role has developed initiatives to engage students, provide quality learning and offer a vision of improved academic achievement. First is whakawhanaungatanga, implemented as part of the orientation programme to promote positive relationships and facilitate early engagement. Students are more likely to complete their course when they have a sense of belonging and connection to their peers, tutors and institution. Second, most students who take automotive courses are kinaesthetic learners who like hands on training; therefore the development of practical training aids that mirror industry components for students to practise on has been enthusiastically received. The third strategy covers the integration of e-learning into the future vision and delivery of the automotive programmes to equip students with the technological skills needed in the workplace of the future. We believe that these initiatives are transferrable beyond the automotive field and may be useful for other vocational programme deliverers.

Background

Bay of Plenty Polytechnic (BoPP) has been training students for a career in the automotive industry for over 20 years. The political climate in recent years has seen increased accountability required from institutes of technology and polytechnics (ITPs), not only in that we must remove hurdles for applicant entry, but we also need to ensure higher levels of success. The challenge facing our Automotive Group was how to improve success above the norm of around 50% in year one and 60% in year two.

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The current automotive applicant varies, some are mature and retraining, while some are in their late teens to early 20s. Some of our students come from employment looking to formalise a qualification, while others have left school without a plan and are now ready to study as mature learners. However, the majority of our learners for several years have been 16 to 17 year olds. This largest group are typically kinaesthetic learners who would not usually consider university as an option and are unlikely to even have a driver's licence, let alone a history of qualifications and academic achievements. It is likely these applicants have just left secondary school without fond memories of the classroom; consequently they are not attracted to a classroom environment in tertiary study. This alone provides a challenge, as in level 2, with so many fundamental principles to learn, the theory requirements are very high and often at the limit of the numeracy and literacy skills our students come in with.

The 16 to 17 year old demographic is also unlikely to have had much life experience, employment or exposure to social accountability. The result is that, in addition to automotive training, institutions are also expected by industry to turn out well-rounded, work-ready and responsible graduates.

The programmes

In 2009, the New Zealand Qualifications Authority (NZQA) announced that the current automotive engineering qualifications would finish by 2012. The BoPP Automotive Group embraced this challenge assisted by two drivers: feedback from the wider local automotive repair industry from a survey carried out in the businesses, along with the expiry of an old outdated qualification. Our response has seen us become the first ITP to develop a training programme to deliver the new National Certificate in Motor Industry, Automotive Electrical and Mechanical Engineering, and Light Vehicle, level 3. Now we have a two year, full time programme with a level 2 BoPP exit certificate after year one (stage 1). Those graduating are able to return for the level 3 second year (stage 2). Level 2 embeds fundamental theory and practical knowledge and skills. Our newly developed programme was designed using a holistic approach of training in systems and closely related subjects that are likely to be found in the automotive repair environment. This meant training and assessment often incorporated two or more unit standards. Integrated training and assessment support a continuous crossover of classroom and workshop training in our subject specialist workshops. Level 3 training moved into our commercial workshop "Bay Auto", where application of those skills and knowledge gained could be experienced and assessed. There is still a classroom element in an advanced theory testing environment, but learning and practical training and assessment are now carried out on paying customers' cars. In essence, this model is well suited to the level descriptors of each level. Industry was pleased with this new model; however, a significant challenge remained for us to reach the institutional benchmark of 75% success in both years of training. A key difficulty for us was losing our trainees before graduation to employment. While we see any trainee at any stage gaining employment in their

chosen vocation as “success”, the Tertiary Education Commission does not measure institutional student outcomes that way. At this stage we had not developed an apprenticeship training option. This meant that, even if previously employed, trainees who wished to continue toward graduation could not train with us.

With this in mind, we developed our own managed apprenticeship model. This model in itself proved to be a compromise between industry requirements, where apprentices are expected to be productive and receive training-on-the-job, and meet our own organisational standards, where we wished to graduate apprentices with skills consistent with our full time trainees.

Apprenticeships with a student – Institution – Industry focus

Further development and improvement in the way we delivered our training material to our managed apprentices paved the way to our current successful model, and this is supported by a number of key initiatives; strong relationships, feedback, and a communication triangle between the Automotive Group teaching staff, adjunct and support services colleagues at BoPP, and employers and industry representatives, give us a model that is personalised, not only to our local industry at large, but also to individual businesses’ work scope.

We first developed the level 2 and 3 managed apprenticeship model, then our level 4 programme. Level 2 and 3 managed apprentices have a paper-based training plan with theory assignments and tests. Practical experience is expected to be gained in the workplace. Regular visits, on-site assessment and three-way discussions can validate competence for these students. However, level 4 is different, in that it has a managed apprenticeship training option only, requiring trainees to be employed in the automotive repair industry, and the training is delivered and facilitated in an online format. All the training material, assignments and assessments are online, and students’ work is submitted electronically for marking and feedback. Level 4 apprentices are now much more autonomous, and relationships with teaching staff are generally via email and text message.

eLearning requirements

This type of relationship needs to be managed, not only at apprentice/tutor level but the institution must set up standard operating procedures for marking, feedback, uploading and filing of documents to provide consistency and sustainability. Apprentices should be well trained in the use of the software, so they know how to do their own uploading, attachments and filing. The training also needs to help the apprentices make two distinct shifts. First, an understanding of the level descriptors which move from applying knowledge with some supervision in level 3 to more advanced and complex system diagnosis and repair in level 4 with no supervision. Second, there is a shift from paper assignments, which act as a visual motivator, to an online programme requiring higher levels of self-motivation. The type and

amount of feedback tutors provide students is now the main method of maintaining whakawhanaungatanga. Of course, as for any apprenticeship, workplaces must be visited for assessment, validation of submitted work and adding value to students' feedback in person. The development of all our managed apprenticeship programmes has served to further help our Group to gain new enrolments and retain trainees from level 2 to graduation at level 4, as fully qualified automotive technicians.

As with most trades, automotive tutors are generally employed for their high levels of specialist industry knowledge and currency rather than their teaching experience. Tutor or teacher training has not been given the same priority. This can mean early-career teachers, in particular, will default to a teaching style that mirrors how they were taught, and for most, their training was mainly in an industry environment (Mitchell, Chappell, Bateman, & Roy, 2013). In our full-time training or apprenticeship models, the trainee is our customer and we, as an ITP, are responsible to them, our community and industry for successful outcomes. Some significant teacher training is of great value in shifting tutors to a student-centred approach to teaching. Engaging a group of students with varying styles of learning from enrolment to graduation is key to improvement (Gregson & Sturko, 2007).

A range of initiatives

Training aids

For as long as automotive experts have been tutoring trainees, there have been specialist training aids developed to try and enhance or improve the outcomes of as many types of learner as possible (Vaughan, O'Neil, & Cameron, 2011). Collaboration with local industry, other ITPs, and personal and professional development of training aids are all approaches we have taken to bring something new and improved into the programmes. These improvements have two significant elements. Firstly, longevity, as training aids in some of the more fundamental aspects of vehicle mechanics and design remain valuable for long periods of time. This adds value to training in a very sustainable manner. The second element, currency, is much more challenging. We are expected to be leaders in training, so we must remain abreast of automotive technology. Keeping pace with the recent automotive technology evolution has meant considerable study for tutors as well as expense for ITPs (Abbott & Doucouliagos, 2004).

The motor vehicle today has developed into a high-tech conglomeration of exotic materials, designs and electronics. Personnel working on these vehicles have to amass a wide range of skills and a wider knowledge base than ever before. The terms "grease monkey" and "auto mechanic" are becoming words of the past; now "service technician" and "diagnostic technician" are common descriptors. To be successful, automotive technicians today must have good physical skills (be good with their hands) and also have a logical/analytical personality trait. Typically, a good automotive graduate needs to be good at maths, able to read quickly and efficiently, and be able to comprehend and analyse large amounts of literature to carry out

modern servicing and diagnostic work. These needs are recognised by the National Certificate qualification including “Electrical” in its title (Kennedy, 2013).

All ITPs are looked upon by industry as leaders in tertiary trade training, having the ability to train to the highest level with the latest facilities and equipment at hand. However, automotive technology is advancing at such a pace that it can be difficult to keep up. This is certainly the case at BoPP, where automotive tutors are very aware of the risks and reality that we are lacking in a number of areas. In particular, training aids are required for training students in new technologies, such as automotive light diesel, electrical/electronic systems (CAN BUS, fibre optics, etc.), air conditioning, automatic transmission systems including CVT, not to mention the proliferation of increased sales of Hybrid type vehicles. Without training aid resources to support these specialist areas, training capability is compromised and graduates risk arriving in the workplace out-of-date and under-prepared.

Currently, the BoP Polytechnic’s automotive division relies on two streams of support for its development of automotive training aids in its teaching and learning environment. One stream is the local automotive industry supplying used or unwanted parts or componentry that may be suitable for training. This stream only exists because of the goodwill the tutors at the BoPP have within this industry, and is highly vulnerable to staff turnover or changes in management practice.

The second stream of training aids supply is the parts provided from industry. These parts are raw materials, such as a complete component from a vehicle and they still require modifications, repairs or dismantling to ensure the students can test and apply learnt knowledge gained from the classroom theory, in an environment of experimentation. The students need to see the internal workings of the component to really fully understand the mechanics of the parts function. For example, we may be given a motor vehicle as a complete training aid. However, the vehicle needs considerable modification such as cutaways and removal of componentry and covers to access the working system being analysed and tested. Clearly, this level of exposure is not provided from working on fleet or customer vehicles.

The development of raw material into suitable training aids for all students to benefit from requires a large amount of commitment in time, energy and, in some cases, personal financial outlay from automotive teaching staff. With tight teaching loads and other professional demands, reliance on this second stream of practical teaching aids is increasingly tenuous as a key claim to differentiation in the qualification delivery that we can provide. Certainly, as a team, we will continue to investigate resources and aids which assist our full time students and managed apprentices in hands-on learning of their trade, but we are also aware of the need to find new ways of engaging our classes.

In-house learning support

A collaborative effort between organisational management, faculty (the School of Applied Technology) and Learning Advisors (the Ako Awe team) has allocated dedicated resources to operate within programme groups and walk alongside the tutors. This initiative was suggested by a Learning Advisor and was eventually accepted as the preferred model for the Automotive Group after a year-long process of advocacy at school leadership meetings. This model has evolved over the three years since it was initially developed as predominantly a drop-in numeracy and literacy help service, with a Learning Advisor available to be included in a class where a need for tutor support (such as low success and completion rates, or poor student programme evaluations) was identified. Anecdotal feedback from students and tutors was that the immersion of the in-class-and-workshop initiative was contributing immense value. Conversations with the Learning Advisor assigned to the Automotive Group of programmes suggested that their input occurs in three forms. First, if the Learning Advisor was in class looking from a student perspective, they could reflect with the tutor on delivery after class and help establish strengths and weaknesses of the lesson plan. Second, they could look to improve the material the tutor was delivering, in format, language accessibility or structure, offering instructional design expertise. Third, they were well placed to establish relationships with the students in a pastoral care aspect, as they were not in a position of power, having no input into assessment marking. This allowed the Learning Advisor to negotiate student-teacher partnerships, so that all staff work collaboratively to improve student success.

These observations of how learning support is working, align with what others in the ATLAANZ community have observed and reported in earlier conferences; for example, in 2010, Lear and Prentice from the University of Canberra, Australia, found that, in order to achieve improved retention, they needed to begin with strategies to support student engagement and lower institutional barriers. The starting point was creating a culture in which students felt they belonged, both academically and socially. Such studies are also a good example of the need for further research into the academic support requirements of particular student populations as discussed in the Coolbear, Weir, and Sellers (2009) presentation about the work of Ako Aotearoa, delivered to the New Zealand Vocational Education and Training Research Forum.

With early measures in place, so that the tutoring team is very comfortable with Learning Advisors in the classroom and professionally presented teaching material, we feel that we have reached a point of sustainability. The in-class support structure is no longer reliant on individual champions; the model and style of learning support can be passed on and the material remains despite changes in staff. The tutors and the Learning Advisor believe that we are now in a position where we are able to place greater focus on student engagement.

Student engagement and whanaungatanga

Student engagement is based on the assumption that learning is positively affected by the extent to which students participate in “educationally purposeful activities” (Coates, 2006, p. 17) and takes place within a context (Johnson, 2008). According to Kuh, Kinzie, Whitt, and Associates (2005), “engagement is the term used to represent constructs such as quality of effort and involvement in productive learning” (as cited in Kuh, 2009, p.6). Zepke and Leach (2010) believe student engagement is complex and has extensive implications.

The large-scale research undertaken in the Australasian Survey of Student Engagement (AUSSE) conducted by the Australian Council of Education Research, has developed a six-factor model for assessing student engagement: Academic Challenge; Active Learning; Student and Staff Interactions; Enriching Educational Experiences; Supportive Learning Environment; and Work Integrated Learning (Radloff, 2010, p. 7). In 2010, a pilot survey of 10 Institutes of Technology and Polytechnics (ITPs) found that “ITP students reported somewhat higher levels of staff student interactions than those in universities and similar overall levels of support (although first year students in ITPs identified a more supportive learning environment than their counterparts in universities” (Radloff, 2010, p. iv). We believe that the involvement of Learning Advisors with the Automotive programme students, and the hands-on support they provide is a good example of how ITPs and, in particular, vocational training programmes, can be particularly successful in enhancing this avenue to increased student engagement.

Much of the research contends that both students and institutions have to take responsibility for student engagement. For the students’ part, they need to be willing to connect and make the time and effort it takes to become active participants, whether it is in the learning process or with available institutional services, activities and events. Tertiary institutions, on the other hand, must provide services, opportunities, activities and a conducive academic and social environment in which students will want to engage (Coates, 2006; Kuh et al., 2005). How do we do this? The obvious starting point is from the students’ first day on campus.

Recognising students as presenting with a holistic world view, including prior learning (whether formally from school or other education, or from life experiences) as well as a range of personal aspirations and imperatives, is essential here. A key approach adopted by the Automotive Group is the concept of “Whanaungatanga”: the “basic cement that holds things Māori together” (Ritchie, 1992, p. 67). Ritchie (1992) sources the meaning of whanaungatanga from whānau, “family . . . or body of close kin, whether linked by blood, adoption or fostering”; ngā as a generalised extension of whānau; and tanga as an indication of “a process concept concerned with everything about relationships between kin” (p. 67).

The Automotive team, alongside the institution’s Learning Advisors, have introduced an orientation programme in the first two weeks of the programme that is aimed

at developing strong relationships from the very beginning which is followed by ongoing maintenance of those relationships. Whakawhanaungatanga is the deliberate building of relationships through triangulation between students, tutors and our institution. Whakawhanaungatanga is initiated immediately and maintained through group participation in activities focused on getting the students to know each other, tutors and their environment. The use of name games, introductions, paintball, questionnaires, barbeques, identification of learning styles, establishing class rules, engaging in motivational activities and goal setting were all useful strategies. This relationship-building approach is taken further, with orienteering competitions around campus and meetings on site with our various support groups. Tutors share personal background and experiences with students, thus helping break down traditional “us and them” barriers.

Both teachers and in-class learning support specialists play an essential part in student engagement in their work to provide quality learning opportunities that challenge and extend students’ academic abilities (Zepke & Leach, 2010). In addition, educational practitioners also need to take on board the task of encouraging students to engage in relevant and supportive, co-operative and social activities, inside and outside of the classroom (Coates, 2006), keeping in mind that learning needs to fit around students’ lives and external commitments, particularly with the increasing number of diverse and part time students undertaking tertiary study. However, the efforts made to engage students have the potential to help them, not only academically but additionally to integrate them into the institution, so they feel a sense of belonging, are valued, can develop trust with staff, and experience personal growth as well as gain qualifications (Bryson & Hand, 2007).

Course material introduced within the first two weeks covered unit standards such as Managing your own Learning and Problem Solving and were delivered with all cohorts together. This engendered a sense of belonging and bonding to their tutors and to their cohort peers as they engaged in team activities visually, aurally and kinaesthetically in friendly competition.

A poutama model was set up as part of Managing your own Learning to track student achievement in regards to their completions for each course (5 week blocks) and these levels were signed off by each respective tutor. This model enabled the maintenance of whanaungatanga throughout the year as each milestone was acknowledged and celebrated at the end of each course with a gathering together on the last day of the course with a barbeque, congratulations to the students and signing off their Poutama Model chart (see Figure 1).

Sustainability of whanaungatanga was also made possible by intensive and continual support of the Learning Advisor who was present in the class on a regular basis (daily and weekly). The Learning Advisor established close relationships with the students and tutors, and worked collaboratively with both to ensure students had another listening ear. The students were constantly being tracked for attendance, their

wellbeing was monitored, and their assessment completions checked. The Learning Advisor was an integral part of the course and classroom environment and was a part of all celebrations.

Poutama model

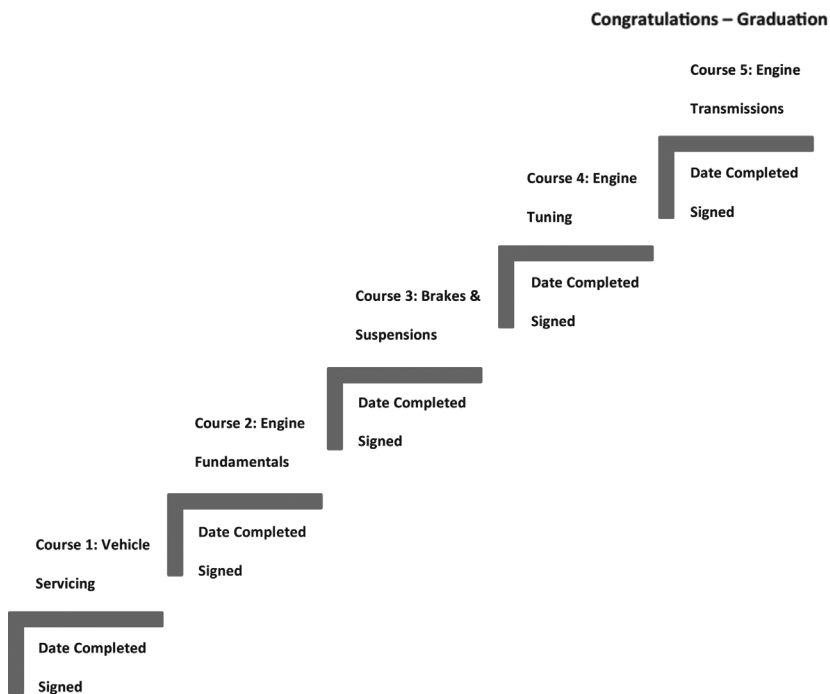


Figure 1. The BoPP Poutama model developed to show Automotive students the steps to success

Results

The model we run now has shown us that retention has improved, both over the first two weeks and throughout the year. Outcomes have also improved every year in level 2 since its introduction in 2011. Success in level 2 has resulted in improved outcomes at National Certificate level 3.

These improved outcomes, in turn, are now flowing on to level 4, where apprentice numbers have grown since it began in 2012 indicating a desire of more level 3 graduates to remain with us even off campus. Staff changes in the last 3 years have shown that the sustainability of our Learning Advisor initiative has remained.

There is much support from within the team to induct our new tutors into the whakawhanaungatanga system, which is now embedded in our group. The group activities during orientation, before classes are split up, share the tutoring load at the beginning of the course. The material is easily understood and delivered and students quickly feel part of a new larger whānau. Relationships remain strong for the entire time trainees are with us, and networks and friendships widen into industry and community once graduates leave us, not only adding value to our trainees, staff, and community, but also strengthening the value of our programme for the future.

Conclusion

With a mixture of automotive and educational skills and a history of training and relationships in the Bay of Plenty region, the BoPP automotive group have a solid background and wealth of knowledge, experience and resources to draw on. We adapt to the generational change of applicants, the changes in funding models and the cultural demographic of our students as well as the rapid evolution, diversity of scope and constant change within our motor industry. With the support of our institution, resources and staff, we have been able to work closely as a team to develop new training models that are ground breaking in the ITP sector. Always mindful of sustainability and quality assurance, the calculated risk is paying off through the use of whanaungatanga to engage trainees and te poutama to celebrate early successes and maintain engagement.

A presence in industry with our managed apprentices and their employers has maintained whanaungatanga in a tri-lateral sense. This is especially so for those students at level 4 enrolled in our on line training where facilitation and feedback on their researched assignments keeps relationships current. All trainees at some stage are exposed to our training aids; there is really no other comparable business that trains and carries out every aspect of such a diverse trade. Maintenance and modification of existing training aids and development of new teaching resources also serve to upskill and maintain currency of our staff as we endeavour to keep pace with new and emerging technologies.

We believe, by graduation at level 4 as a qualified automotive technicians, our students are well equipped to enter our local industry as valuable, employed, qualified technicians, who most importantly also have the tools to continue to learn. We are all very aware it is one thing to be qualified and at a relatively early point in the journey, but another, to be someone who has the skill, ability and confidence to run or own a business. To grow our industry and economy, these are the graduates we need, and this is the vision our team conveys on a daily basis to our students, our future.

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