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Preparing vocational students for future workplaces:
Towards a course evaluation of the Unitec Bachelor of Applied Engineering

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and
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Preparing vocational students for future workplaces: Towards a course evaluation of the Unitec Bachelor of Applied Engineering

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ABSTRACT

This exploratory study set out to evaluate how well a particular course in automotive engineering is set up to enable students to develop skills necessary to enter the workplace. The research set out to identify trends in student expectations and in the needs of employers at a time when this field of work is characterised by disruptive technological developments such as computerisation and automation. The intended outcome of the research is that the findings will assist the critical thinking of course designers as they reflect on modifications that might be necessary for Unitec Bachelor of Applied Technology (BAT) graduate attributes to fully meet future workplace demands. It is also an aim that this exploratory evaluation of a small cohort of students can, despite its limitations, identify trends for future pedagogical research in the ITP (Institutes of Technology and Polytechnics) sector. Although not a full course evaluation, this study invited feedback from students and recent graduates in relevant employment regarding the alignment of the Unitec Bachelor of Applied Technology (BAT) course design with their perceptions of skills necessary in the workplace. Another intention was to highlight any misalignments between the realities of the automotive engineering sector and student expectations of the course: To what degree are work capability expectations in agreement between the student stakeholders and the institution? Are the course goals realistic and in line with actual industry needs? How is the definition of work readiness changing? The paper also samples current speculative thinking about skills that are becoming progressively more important in the workplace, namely the so-called 'soft skills' in communication, problem solving, management and collaboration, and in dialogic and creative attributes relevant to increasingly automated and globalised workplaces.

INTRODUCTION

In this study, past and present student respondents were asked how well they thought the BAT prepared students for future workplaces. The research was intended to be in line with the New Zealand Tertiary Education strategy 2014-2019, which aims – among other things – to ensure that

"the tertiary education system performs well, not just as its own system," and that "the system can adapt more quickly to change, including changing technologies and changing patterns of demand" (Ministry of Education, 2015, p. 1). The strategy has six priorities, including "delivering skills for industry" and "getting at-risk young people into a career". The overarching goals are to "to achieve broader benefits" for society, and for "individuals to develop as confident, creative, and culturally enriched citizens" (Ministry of Education, 2015, p. 2). These outcomes cannot be achieved by the delivery of content alone – they demand the development of attitudes and skills that require markedly different teaching strategies. These skills need to be clearly identified in order ensure their successful development for students, the state and target industries.

It was clear from the outset was there were wide discrepancies in expectations among the student respondents concerning skills such as communication, which was of concern considering research from Frey and Osbourne (2013) and Goleman (1999), who unequivocally identify strong communication skills as key attributes sought by employers: "The three most desired skills are communication skills, interpersonal skills and initiative" (p. 13). This raises a very clear question: Why are we not emphasising communication, for example, more strongly in our vocational courses? This will clearly need to be addressed in future redesigns of the BAT course.

Graduates in an automotive engineering work environment obviously require mechanical skills, but they also need proficiencies in communication and computation, and lifelong attitudinal attributes for professional development and career progression – these include slightly less-tangible qualities such as adaptability, courtesy and social intelligence.

Computerisation and developments in vehicle technology that prioritise environmentally friendly designs are already disruptive trends in the automotive industry. These, along with the spread of electric vehicles and driverless capability, mean that automotive courses will need to refine their content to ensure that their graduate attributes are relevant for the changing employment market and workforce demands.

The BAT is a degree-level course that aims to prepare students for roles that are above and beyond workshop mechanical skills. BAT graduates can expect to aim for supervisory and project management roles, and other non-workshop designations. These are all factors to be considered in any attempt to align the skills that analysts predict will be in demanded in the future with the current graduate profile for the BAT. In the research, these factors were analysed in relation to feedback from BAT graduates in order to insightfully plan future course development.

METHODOLOGY

A qualitative approach was used for this research, involving discussions with the current BAT students and graduates. Graduate outcomes for the course were also evaluated in relation to student stakeholder expectations. The main aim was to attempt to identify commonalities and differences in expectations in relation to the institution's goals for the course of study.

The same questions were asked of graduates and undergraduates. The respondents participated by writing their answers in the questionnaires (see appendix 1 and 2), and by sharing their views in a whole-group discussion using a Small Group Intensive Discussion (SGID) format. The following stakeholders were interviewed:

1. The current (2016, semester 1) cohort of BAT students. Focus-group meetings were held, and the questionnaire was distributed. Students completed this individually, and this was followed by a group discussion.
2. Former students/graduates from BAT who have left Unitec and are in relevant work. Seven one-to-one meetings were held with BAT graduates. Each had filled out the questionnaire, and we discussed their ideas and suggestions in relation to the research question.

The ensuing discussions about skills needed in imagined future workplaces showed that perspectives differed considerably between the graduates and the undergraduates. In general,

the undergraduates had little or no automotive work experience. The graduates all tended to have had between two and ten years' experience in automotive-related fields ranging from vehicle inspection, automotive factory work in Sweden, to lecturing in automotive subjects at tertiary level.

Graduate responses on the whole tended to take a much broader interpretation of skills needed in the workplace, giving more voice to 'soft skills' (cognitive and interpersonal proficiencies, and personality attributes) such as honesty, punctuality and communication. Undergraduate responses tended to focus chiefly on subject knowledge and technical skills. Areas such as communication skills were often perceived by undergraduate students to be 'a waste of time', whereas, among those in employment, it is a highly regarded skill. It is increasingly becoming a component of courses, along with other skills such as critical thinking.

LITERATURE REVIEW

Predicting the future is always difficult. A Disney imaginer (Ferren, 1999) puts it like this: "We're always very bad at predicting how a given technology will be used and for what reasons.¼Theatre people used to think that the idea of motion pictures was ridiculous" (p. 370). Similarly, Rennick (1999) contends that "The future is itself a story, and predictions are stories we tell to amaze ourselves, to give hope to the desperate, to jolt the complacent. The trouble comes when the story teller tries to predict the future¼in a voice of certainty" (p. 372).

Current indicators show that automotive engineering, as a field, will not escape disruption from constant technological change. It will pay for students to focus on what future skill development is necessary in order to avoid role redundancy, and to understand what uniquely human skills will be needed in a rapidly changing employment landscape. Institutions, to support them, need to keep on top of what one report describes as "the ability of human labour to win the race against technology by means of education" (Frey & Osborne, 2013, p. 14).

As far back as 1999, Goleman predicted that "The rules are changing. We're being judged by a new yard-stick: not just by how smart we are, or by our training and expertise, but also by how well we handle ourselves and each other.¼The new measure takes for granted having enough intellectual ability and technical know-how to do our jobs; it focuses instead on personal qualities, such as initiative and empathy, adaptability and persuasiveness" (p. 3).

Stormer et al. (2014) state that "Work in the future will be more and more interconnected. Employees (and employers) will require the competencies to work across different disciplines, to collaborate virtually, and to demonstrate cultural sensitivity" (p. 28). The research outlines some key considerations for individuals, employers, and education and training providers. Among the recommendations are that educators do the following:

1. Collaborate closely with employers to support them in achieving their business and skills objectives to ensure provision is responsive to their needs and forward-looking in a competitive learning market.
2. Be prepared to adapt to the continuing disruption of established income streams and business models arising out of the marketization of learning.
3. Invest continuously in new modes and content of provision. Keep abreast of developments and understand the impact of technology on learning delivery (p. 32).

However, change will not only occur through the efforts of training providers – it also needs to happen at an individual level – students will need to play their part. Individuals will need to "Change mind-set regarding the nature of work, as it becomes less location specific, more network oriented, project based and increasingly technologically intensive." In addition, they will need to "¼jump across specialist knowledge boundaries as technologies and disciplines converge¼" (p. 31).

There are clear indicators that rapid new developments in vehicle technology,

computerisation and environmental policies are all having a dramatic impact on the automotive industry. Gao, Kaas, Mohr and Wee contend that, "the automotive industry is ripe for disruption" (2016, para. 1), and that "economies are dramatically changing. Digitization, increasing automation, and new business models have revolutionized other industries, and automotive will be no exception" (2016, para. 2). A recent news article (Matthews, 2016) predicts the future will feature "Driverless cars and no traffic lights." Another headline from the same day declared "German parliament supports proposal to ban new combustion-engine cars by 2030" (2016). Matthews stated that, "The effect of autonomous vehicles and the technologies that will connect them to other vehicles and systems will see future generations choosing to buy their mobility as a service, rather than own vehicles like most of us do today" (para. 6). The article goes on to predict that people will be simply buy mobility services, much as we currently do telecommunications.

However, the automotive engineering training sector has shown inaction in adapting to some new technologies such as electric cars. And the Institute of the Motor Industry (IMI) magazine states that automotive training is down 15% and cost seems to be one of the major factors. Kiek (2016) points out that there should be regulation and licensing around work with electric and hybrid vehicles, and that the IMI is leading the call on the government to act: "Just one death resulting from a technician working on such a vehicle represents a catastrophic failure of the state to protect its citizens" (p. 19).

Given the rate of technological change, the subject of what skills will be necessary in future automotive engineering workplaces ought to be very much on the agenda. Rapid developments in computerisation and robotics have led to much speculation about what workplace skills will look like. The advance of digital technology has taken us to new means of production: 3D printing is, for example, a technological capability that will have a clear impact on the way manufacturing and production is carried out. Another disruptive economic variable includes 'offshoring' as a trend in manufacturing. Jobs that are easily 'offshore-able' may face higher degrees of uncertainty in countries where low-cost manufacturing is not feasible.

Many of the manual skills of the past may be destined for automation, and this will impact on the types of skill sets required. It is already a reality that a single car manufacturing plant can produce an automobile every 60 seconds, twenty-four hours a day. According to a recent report, "about 47 per cent of total US employment is at risk" from automation (Frey & Osborne, 2013, p. 1). Clearly it is time for further research into what skills students need to meet these uncertainties in order for training providers to adjust the way students are prepared for work through vocational study.

Gao et al. (2016) produced a report on disruptive trends that will positively transform the automotive industry. In the report, they contend that "The automotive revenue pool will significantly increase and diversify toward on-demand mobility services and data-driven services" (p. 1). According to the article, opportunities for the automotive industry will increase rather than decrease, even in the event that we abandon fossil fuels altogether. Clearly, an end to fossil fuel use will mean there will not only be no need for petrol fuel technology, but also basic services that we use now, such as oil changes. However, there will be new sets of essential demands: autotronic and computational skills related to automotive manufacture, design and services are likely to be universally required.

Frey and Osborne's research suggests that robots are unlikely to compete with humans in social and emotional intelligence. Jobs that require critical thinking, which is a non-routine task, will likely remain: "In the present study, we will argue that legal writing and truck driving will soon be automated, while persuading, for instance, will not" (2013, p. 4). Opportunities for humans clearly remain, but it is suggested by many that it will be far from business as usual. It may be possible that robots will free managers up to be more creative or design- and project-focused. Nevertheless, they claim that "about 47 per cent of total US employment is at risk" (p. 1).

Their research, based in the UK, presented a scale of probability of automation for some 600 jobs in a wide range of professional sectors. In the context of this research it is interesting to note the difference in the projected impact of automation between automotive or mechanical engineers, and automotive or mechanical technicians. The chance of the role of mechanical engineer being phased out has a low probability of 0.011, with 1 representing total replacement by automation. By comparison, mechanical engineering technicians have a probability of 0.38 of being made redundant, along with roles such as packers, surveyors, interpreters and translators (Frey & Osborne, 2013). Since the Bachelor of Applied Technology aims above technician or workshop-mechanic level skills, it suggests mechanical engineers of the future, being less 'automatable', will face less disruption and have a higher chance of gaining employment than technicians, albeit with a different relationship to technology.

Although it is difficult to predict with certainty what skills will prevail, Davies, Fidler and Gorbis ask, "What are humans uniquely good at? What is our comparative advantage? And what is our place alongside these machines? We will have to rethink the content of our work and our work processes in response" (2011, p. 3). Letheren and Glavas (2016) support this with their contention that: "Reading and responding appropriately to verbal and non-verbal social cues is probably better handled by a human, who can self-monitor and adjust their behavior accordingly. So those tasks that require true (not programmed) empathy or critical thinking and problem-solving are the ones you'll probably still want humans for" (para. 22; para. 24).

Cohn (2013) speculates on the future need for doctors, following technological 'disruption' to routine human work tasks, specifically looking at an IBM supercomputer that can generate data on a patient's condition. The machine can process up to 60 million pages of text per second – including 'natural text'. It can provide several sets of data on one patient, where a doctor may only focus on one. However, doctors will still need to be there to interpret this data: "Physicians do more than just process data.¼For the past few decades, as IT has disrupted other industries, from manufacturing to banking, millions of well-paying middle class jobs – those easily routinized – have vanished. In healthcare the disruption has the opposite effect" (p. 4). This example from the medical field could be a helpful analogy when speculating on the future of automotive engineers.

Looking at the list of the most valued skills drawn up by Davies, Fidler and Gorbis, it seems clear that skills such as creativity, critical thinking and collaboration will be crucial. All of these are useful heuristics with which to evaluate the Bachelor of Applied Technology course. They identify six drivers of change as key reasons why future work skills will not be business as usual:

1. Extreme longevity
2. Rise of smart machines and systems
3. Computational world
4. New media ecology
5. Superstructured organizations
6. Globally connected world (pp. 3-5)

In response, the IFTF identifies ten key skills that will be needed in the future workforce:

- Sense making
- Transdisciplinarity
- Novel and adaptive thinking
- Social intelligence
- New media literacy
- Computational thinking
- Design mindset
- Cognitive load management
- Cross-cultural competency
- Virtual collaboration (pp. 6-7)

DISCUSSION

The research, therefore, needs to consider these changing demands and to identify any gaps between these and the current course model.

The current Unitec BAT graduate outcome statements can be seen in Figure 1. It is worth

noting that they do not include the ability to demonstrate contemporary knowledge and applied skills for servicing electric cars, nor is there explicit reference to future development trends for servicing automotive technology for eco-cities, with strong consideration given to goals such as zero waste, driverless vehicles and sustainability. It could be argued that the lack of explicit reference to these considerations is an oversight that may weaken the emphasis on the future reality of automotive work skills. Students should be left in no doubt that communication skills are highly valued, given the content of the course documents provided, but the same may not be true of the ability to predict and adapt to future trends – either technological or soft skills-related. In this course of study, these should be made as explicit and true-to-life as possible.

There are clearly points at which the outcome statements align well with the key skills identified by the IFTF. The current model promotes novel and adaptive thinking, as well as a design mindset and keen skills in analysis and articulation. Critical thinking is actively promoted. However, there are also some other notable gaps, such as a lack of transdisciplinarity, moving with up-to-date technology, and the addition of companion courses such as entrepreneurship, which might help to empower graduates with the knowledge and skills to start up and run businesses.

In a large tertiary institution such as Unitec, transdisciplinarity pathways would be relatively easy to address, but would require some major course design changes. Several graduates and some of the undergraduates expressed a desire to have options such as business management, computing or communications as modules to complement their preferred specialisation in automotive engineering. One graduate said, for example, that it would have saved him the trouble of studying business administration for a year after he had completed the BAT.

While biculturalism is emphasised for the New Zealand context, cross-cultural competency also needs to be addressed to give the course a more global outlook. Perhaps this could be related to work goals, particularly in the case of students who want to further their career overseas. One graduate respondent, from India, who had been employed by Volvo in Sweden, had learned a great deal about workplace practice and how automotive companies in Sweden actively recruit from university graduate showcase days. Perhaps

GRADUATE OUTCOME STATEMENTS
Is an effective communicator who demonstrates the capacity for independent critical thinking and problem-management
Has an appropriate level of technical knowledge and applied skill within a chosen area of technology
Makes effective decisions about technology in relation to design solutions and the selection of materials and methodologies
Has the ability to conceptualise, set up, implement and evaluate industry projects that integrate both technical and social knowledge
Has ability to undertake innovative and entrepreneurial activity and to explain achievements within an applied theoretical framework
Has an understanding of interrelationships amongst technology, business, society and culture, and how these affect the workplace
Has a bi-cultural awareness
Has the ability to undertake basic research using explicit methodologies and methods
Has the ability to work collaboratively
Has the ability to communicate effectively with peers in associated business and technical professions
Works safely and ethically in an informed and legislatively compliant manner
Has a level of competence required to establish him/herself as a self-employed technician or trades-person, who is self-reliant and committed to on-going professional development
Has the ability to reflect on practice

Figure 1. Graduate Outcome Statements for Bachelor of Applied Technology (Unitec Institute of Technology, Auckland, New Zealand)

a similar model could be tried out in Auckland.

This same student had, however, found a disconnect between the course and the reality of work, particularly in relation to motivational factors and attitudes to soft-skills development among many of his peers. He came up with a suggestion for an automotive expo towards the end of the course, where students could showcase their talents to prospective employers. This would create clear links, or at least illuminate pathways, to employment. Added to this could be components such as the option to include a foreign language in an automotive course of study – an option that might directly contribute to employability in foreign contexts.

The BAT students are currently required to write a research project, and also give a related presentation. This model gives all students presentation-skills practice, but the presentations are all stand-alone projects. Whilst the exercise develops many skills, it does not encourage the development of dialogic proficiencies such as negotiating and persuading. There is also the attendant risk that students will focus only on their own efforts, and switch off while others are presenting. A shift in the design of the brief from individual to group work-structures might deepen the value of the exercise, particularly if elements of transdisciplinarity and collaboration are prioritised.

Choudaha (2008), likewise, affirmed the need for 'integrative competence': "This urgent demand for an interdisciplinary focus on education and research for the service economy is a reflection of the rapidly changing nature of knowledge work and the critical role played by professional higher education in preparing talent for the future" (p. 3).

It is clear that ITP stakeholders need to reconsider what work skills will be needed in the future. Perhaps the most important message comes from Stormer et al. (2013) who state that "Education and training providers will need to collaborate closely with employers to support them in achieving their business and skills objectives to ensure provision is responsive to their needs and forward looking in a competitive market" (p. 108).

A) THE PERCEPTIONS OF THE 2016 STUDENT COHORT

In answer to the main research question, the 2016 cohort raised a number of issues. Among the undergraduates there was some discussion about the weightings of assessments. Some felt that there needed to be more weight placed on the practical side of the course, preferring 80% theory and 20% practice, or 70% theory and 30% practice. Some wanted 'more on engineering' in year three, and less on 'social impact issues'. They felt that the balance in years one and two was good. Some said the way the course was presented online was misleading, as they had expected more to do more study connected to 'hands-on' engineering, perhaps using design and calculations to build a project artifact.

Among the undergraduates there was little discussion of some of the valued work skills identified by The Institute for the Future (Davies et al., 2011), such as transdisciplinarity and communication, and there are also gaps in the current course content in this respect. Some of the comments also revealed a lack of clarity within the course aims and descriptors given by UNITEC, and there was a certain amount of disillusionment about the course content evident in student comments:

- Some wanted less focus on soft skills such as communication, and more focus on automotive practical skills. There was a general perception (in contrast to graduates interviewed) that there was too little focus on practical skills.
- There was a desire for more technical engineering subjects to be available in the course, particularly vehicle-design subjects.
- During the first two years, some wanted the focus to be mainly on automotive engineering, but to also allow more course options. For the last year, they wanted to focus on industry and business.
- Students were of the opinion that so-called technologies of the future needed more focus. Electric vehicle technology and hybrid vehicle technology were given as examples.

- Several wanted more industry-related work experience.
- Some felt strongly that management or business course options should be included.
- Some felt the emphasis on presentation skills, research skills, and topics such as sustainability were 'a waste of time', but others felt that they were invaluable.

Their comments suggest a need for changes in the course design and delivery. Some notable gaps in the eyes of the students seem to be:

- The need for a work experience component.
- A better balance of what is termed 'theory' and 'practice'.
- The need to have better clarification of the course aims and objectives, and more focus on the intent of the course, and how this translates to the graduate profile.
- The need to convey clearly what employers want, in particular such attributes as communication skills.

B) THE PERCEPTIONS OF GRADUATES CURRENTLY IN AUTOMOTIVE ENGINEERING EMPLOYMENT

Seven graduates from the BAT were interviewed with the same questions. Concerns about assessment values and weightings were clearly far from their minds now. Noticeably, the graduates took a more eclectic view of skills. In particular the graduates placed much more value on non-automotive skills (such as communication and punctuality) than the undergraduates. In summary:

- One graduate felt that the lack of a work experience component was demotivating.
- Several graduates contradicted the current students' perception of soft skills. Graduates who had been in the industry felt that the communication skills, research skills and other soft skills had been invaluable and needed, if anything, more emphasis.
- Some graduates expressed embarrassment with the perception that the BAT did not enhance mechanical-skills ability, and some noticed in workshop sessions there were students in their group who lacked the ability to carry out basic automotive procedures.
- Two graduates felt that the poor motivation of some fellow students on the course affected their study. They felt some of their peers lacked discipline, direction, and motivation.
- Several of the graduates interviewed expressed opinions about soft skills that contradicted those of the current students. This suggests a gap in perception between those in actual work, and those still studying and preparing for work. One said that soft skills such as being on time for work, reliability, honesty, courtesy and communication were extremely valuable, but were perhaps harder to teach. This former student made the point that hard skills were of course important, but that perhaps soft skills were more so.

There were some significant differences between the perceptions of current students and those who had graduated two to three years previously. One such example was the difference in emphasis placed on communication, which in general is perceived as vital among graduates with industry experience, but is seen as a bit of a chore among undergraduates. Graduates of the BAT were grateful for the research and communication skills the course gave them.

Currently, the course is geared towards research and critical thinking. It encourages students to adopt a problem-solving approach to industry-related problems. These skills are without doubt relevant to success in future workplaces. However, some of the other skills mentioned by Fidler and Gorbis, such as transdisciplinarity, social intelligence and a design mentality, need to be worked into the programme more – a more cross-disciplinary approach to communications modules or business management, for example, would assist with this aim. A strong work experience component during the course would help to provide clearer links between theory and reality. The lack of contact between undergraduates and graduates is something that could be ameliorated – contact with graduates in automotive work contexts would provide a 'reality check' for aspiring engineers.

Similarly, the nature of some of the assessments might need to be evaluated in terms of how well they relate to real work experience. For example, the current model of assessing students on the presentation (a monologue) and the 40,000-word written report would benefit from refreshment to achieve more balanced communication skills. A monologue speech may not be the most relevant form of communication to automotive engineering education. A dialogic presentation incorporating persuasion, disagreement and negotiation could be developed whereby students can compete, contest, challenge and negotiate in relation to industry projects or proposals.

Such a shift would strengthen the elements of collaboration and communication skills-building in the course and it would likely present avenues for expression from different perspectives, creating opportunities for transdisciplinary studies. For instance, if a student was studying a business module whilst undertaking the BAT, they could present a business case for an automotive problem-solution scenario, thus combining their technical know-how with a business perspective, which could also include environmental or sustainability considerations. Adapting the form of presentations could add more dimensions to the current model and be more motivating and realistic for students, giving them an opportunity to combine and present a number of skills at once.

CONCLUSIONS

This research has given clear indications that constant focus on the future is necessary when designing and delivering vocational courses of study. There could be more emphasis on future technologies in the BAT course – electrical and driverless vehicles, for instance – and more focus on 'computational thinking', given the predicted impact of robotics, and the interconnectivity of transportation infrastructures and services. This should also be explicitly stated in the course outcome statements.

A certain amount of virtual collaboration between students already exists, but perhaps there might be ways of exploring this further – a design project could be developed in collaboration with industry, or with another institution in New Zealand or further afield. Unitec needs to invest in more of the most widely-used workplace technologies related to automotive skills; and to introduce access to more up-to-date digital applications, and to vehicles and equipment that are equivalent to what is in current workplace use.

Including an entrepreneurship component could contribute to the development of business innovation skills, enabling graduates to create job opportunities. An automotive industry work-placement component would sharpen the focus on employment in the course, and add value to the depth of experience afforded to students. Inviting graduates to come and speak to undergraduates may also assist students to gain insight into which broader skills they would need in future work. It might also support students to consider possible career development pathways, further contributing to a sharper focus on employment goals.

It is clear, given the disruptions that are occurring in the automotive industry, that greater understanding of the competencies required for work and vocational training would be hugely beneficial to both students and course designers. Re-setting goals to include an interdisciplinary focus, computational skills and to pin the right soft skills to trades would better prepare students to develop the relevant attributes to negotiate uncertainty. It is vital that courses are tightly focused on the needs of target workplaces to determine optimal skill development to best meet the emerging needs of students who wish to work in the automotive industry.

APPENDIX 1: BACHELOR OF APPLIED TECHNOLOGY GRADUATE QUESTIONNAIRE

Aim: To investigate the relevance of the course content to industry work-skills needs.

Research question: Do the courses in the Bachelor of Applied Technology progressively develop the required work skills for the students to meet industry needs?

Question 1: Do the skills developed in the courses you have studied meet the requirements of your job?

Question 2: Did the course equip you to deal with new and emerging challenges in your job?

Question 3: What improvements would you recommend to the course?

APPENDIX 2: BACHELOR OF APPLIED TECHNOLOGY STUDENT QUESTIONNAIRE

Small group instructional diagnostics

Aim: To investigate student perceptions of course designs against their expectations.

Research question: Do the students understand the work skills they need to develop for their future employment in industry?

Schedule: 15 November 2015 (Exit interviews), 25 March 2016 (Entry interview), 24 June 2016 (Mid-term interview), 21 October 2016 (End Interview).

Question 1: What work skills do you consider to be essential in the automotive industry?

Question 2: How far does the Unitec Bachelor of Applied Technology course prepare you with future work skills?

Question 3: What changes do you recommend in the courses for development of future work skills?

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