

Social and Economic Outcomes of the COTS Control Youth Training Program

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ACRONYMS

ABS	 Australian Bureau of Statistics
AMPTO	 Association of Marine Park Tourism Operators
COTS	 Crown-of-thorns starfish
DAWE	 Department of Agriculture, Water and Environment (Federal Government)
GBR	 Great Barrier Reef
HILDA	 Household Income and Labour Dynamics in Australia
NESP	 National Environmental Science Program
RRRC	 Reef and Rainforest Research Centre Limited
SQW	 Skilling Queenslanders for Work initiative (Queensland Government)
TWQ	 Tropical Water Quality

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EXECUTIVE SUMMARY

In this report we present results of a study of the social and economic outcomes associated with the Crown-of-thorns starfish (COTS) Control Youth Training Program, administered by the Association of Marine Park Tourism Operators (AMPTO) and Gempearl Pty Ltd (the AMPTO 'Blue Army Project'), with funding provided by the Queensland Government's Skilling Queenslanders for Work (SQW) initiative. This study represents a component (Objective 5) of the larger [NESP TWQ Hub Project 5.1](#) "Matching the Crown-of-Thorns Starfish Integrated Pest Management to the scale of the new Control Program". For this project component, our interest was in describing the non-COTS benefits derived from investment in COTS management (i.e. only the social and economic benefits of the training program).

The youth training program (hereafter referred to as *the program*) has operated since 2010 and has produced several hundred graduates. Eligibility requirements for trainees' acceptance into the program include under- or unemployed status, age limits and an assessment (through a selection process) of greatest potential benefits. The program also aims to achieve a high level of Indigenous participation. Approximately ten graduates are produced per cohort over a six-month training program, which includes a substantial work placement component on AMPTO run COTS control vessels. Three cohorts of graduates (i.e. approximately 30 in total) commence and complete the program each calendar year, in a staggered timetable. Graduates leave the program with a range of qualifications and certificates that enable them to work as a COTS control diver, to operate aspects of marine vessels, and administer first aid, among other skills and duties. It is understood that a high proportion of graduates are employed shortly after completing the training program, many within the COTS control program and/or with marine tourism operators in the Great Barrier Reef (GBR).

This study utilised an online survey of graduates to evaluate individuals' perceived benefits arising from their involvement in the program. Prior to the cessation of operations by most GBR marine tourism operators in the second week of March 2020 in response to the COVID-19 pandemic, 42 graduates had completed the survey. While anecdotally approximately 50% of the program participants are of Indigenous heritage, only nine of our survey respondents (21%) identified as Aboriginal and/or Torres Strait Islander, seven (17%) of whom were of Torres Strait origin. Two respondents indicated that they identified with a Traditional Owner group of the GBR region. Respondents had graduated from the program between one and ten years prior (median of two years since graduation). Of the 42 respondents, 19 (45%) reported being in full-time employment, 16 (38%) reported being in part-time employment, and 7 (17%) reported being unemployed at the time they were surveyed.

A comparison of self-reported life satisfaction, from prior to commencing the training, with the present time (i.e. at the time of the survey) showed an average increase of 2.7 points (on a 10-point scale; 1=very unsatisfied, 10=very satisfied), with 36 (86%) respondents reporting an improvement in life satisfaction. Among those who reported a decreased or unchanged satisfaction score (n=6), all were currently employed. Five-point rating scales (1=disagree strongly; 5 = agree strongly) were used to gauge levels of agreement with a series of statements to compare respondents' self-assessed confidence, capacity and efficacy, from before commencement of the training program to the present day. Those statements showing the greatest positive change included: (i) *employment confidence* ("I was/am confident that my

future employment prospects are good”; 88% indicated an improvement, with a mean difference of 1.6 points), (ii) *speaking confidence* (“I was/am a confident speaker in the company of adults outside my family and friends”; 76% indicated an improvement, with a mean difference of 1.8 points), (iii) *pride in skills* (“I was/am proud of my skills and abilities”; 79% indicated an improvement, with a mean difference of 1.6 points), (iv) *GBR connection* (“I felt/feel a strong personal connection to the GBR (or to my sea country)”; 64% indicated an improvement, with a mean difference of 1.2 points), and (v) *care for the GBR* (“I cared/care about the health of the GBR and the natural environment”; 57% indicated an improvement, with a mean difference of 1.1 points).

With the aim of statistically evaluating the impact of the training project on the lives of the training scheme graduates, we applied a *difference in difference* analysis, comparing results of our surveys with data from an alternate sample of individuals living within the GBR catchment region, seeking to estimate the impact of participation in the training program, separate from other influences that may also have impacted the trainees across the time period under consideration. Our alternate sample utilised a subset of the data collected by the Household, Income and Labour Dynamics in Australia (HILDA) surveys which have been conducted in Australia every year since 2001. We note that the HILDA data provides an imperfect counterfactual; however, no better alternate sample was available. The results of the *difference in difference* analysis demonstrate that the COTS training scheme had a significant and positive impact on both the life satisfaction and the employment prospects of the trainees. Specifically, the training program was found to increase satisfaction with life scores by 2.55 points from a base of 5.88 (on average) prior to training (on a scale of 1 to 10 where 10 is very satisfied), and graduates of the scheme were found to be 26.5 times more likely to be fully employed at that time, compared to if they had not participated in the training scheme.

Results from this study show notable improvements among the majority of our 42 survey respondents in their self-reported confidence, capacity and efficacy, which can be at least partly attributed to their participation in the youth training program. Furthermore their self-reported satisfaction with their lives was found to increase by a statistically significant amount, compared to the 12-month period prior to their training, and in comparison to the counterfactual provided by the HILDA data. The results of the statistical analysis were strongly supported by the qualitative responses of the COTS training scheme graduates, who reported significant improvements across a number of different domains of life.

Economic outcomes associated with the program clearly include the improved employment prospects of the participants, providing direct economic benefits to those individuals and their households due to their increased earning capacities. The employment status of training scheme graduates improved, from a mean score of 1.67 prior to training (on a scale where 1=unemployed, 2=part time employed and 3=full time employed) to a mean score of 2.29. This result, combined with the finding that COTS graduates are 26.5 times more likely to be fully employed compared to if they had not participated, highlights the importance of the training scheme in improving the economic situation of the training scheme graduates. In summary, the benefits of the COTS training program are numerous and varied, with the impact that the scheme can have on the lives of the graduates being described by quotes from two survey respondents: “100% this program is the best opportunity I have ever been given” and “I am in a career that I love and never would've gotten into it without the program”.

1.0 INTRODUCTION

The Queensland Government's *Skilling Queenslanders for Work* (SQW) initiative, introduced in 2007, has operated with the aim of increasing workforce participation and stimulating the Queensland (QLD) economy by improving work opportunities for disadvantaged Queenslanders (DESBT 2020; Deloitte Access Economics 2012). The initiative is delivered through local providers (i.e. individual on-ground programs), including local governments and community organisations, who deliver job training, work placements, traineeships and mentoring, among other services, varying between individual programs. The SQW initiative represents a substantial economic investment by the QLD Government. For example, over the six-year period 2015–16 to 2020–21, a total of \$420 million in funding was committed to the program (DESBT 2020).

While published assessments of individual programs funded by the initiative are scarce, an assessment of the impact and effectiveness of the total SQW initiative over its first three years (2007–08 to 2009–10) found significant direct employment benefits and net earnings directly attributable to SQW, including for Aboriginal and Torres Strait Islanders who represented more than half the incremental employment gained over the measured timespan (Deloitte Access Economics 2012). Broader impacts and community benefits associated with the program included self-reported improvements among participants in their health and wellbeing (encompassing life satisfaction, self-confidence, skills, capacity and self-esteem), their social and support networks, community participation and engagement, social cohesion and community resilience (ibid.).

1.1 The AMPTO “Blue Army” Youth Training Program¹

The AMPTO Blue Army Youth Training Program (the program) commenced in 2010 with funding provided by the SQW initiative. The program provides training and certifications for a range of professional marine-based roles and duties, and part of the training process includes a work placement on AMPTO-operated vessels carrying out activities under the [Crown-of-thorns Starfish \(COTS\) Control Program](#), as well as marine tourism vessels operating in the Cairns region. Since the program's commencement, more than 300 participants have reportedly graduated. In addition to diving qualifications, and work experience with dive and tourism operators, successful graduates also achieve a TAFE Certificate 1 in Business qualification.

Anecdotal reports of the program's longer-term contribution to participants and the wider community have included the advancement of the careers and aspirations of young people in the region, and wider socio-economic flow-on benefits, including the achievement of graduate employment of >80%. Anecdotally, these benefits flow to both Indigenous and non-Indigenous youth, with the program seeking to attract 50% of the training scheme participants from under-employed and unemployed Queensland youth who identify as being Aboriginal and/or Torres Strait Islander. Annual reporting and auditing of program outcomes and financial details is a

¹ Details describing this program are reported in good faith, based on notes taken from face-to-face meetings and conversations that occurred during the initial engagement phase of the project. Published data or other written information sources verifying these details were not available at the time of writing (e.g. including the total SQW funds invested over the life of the program).

requirement of SQW. Since the commencement of the program in 2010 it is understood that the delivery of the scheme has been refined such that three courses are run per year, commencing in January, March and May, with each course lasting for six months. Each course commences with ten to twelve students, such that the total annual program output equates to approximately 30 students. The Queensland government investment in this training amounts to around \$1m per annum; specifically for 2020 an amount of \$1,050,000 was awarded for funding 30 trainees².

1.2 Economic context within which the project is situated

Unemployment is acknowledged as an issue contributing to sub-optimal outcomes across a number of different domains. In purely economic terms, unemployment can be seen as an indicator for market failure, signalling the underutilisation of a scarce resource, representing a failure to productively use all of the labour force available (Stiglitz & Rosengard, 2015). However, it also contributes to individual, social and cultural problems, over and above the economic implications, including contributing to many of the ills facing society, such as rates of crime, drug use and suicide, and causes adverse impacts for the health and wellbeing of those who are unemployed. On an individual level, the impacts of being unemployed have been found to affect personal wellbeing (as measured by self-reported life satisfaction), even after controlling for the loss of income resulting from unemployment (Clark, 2003; Winkelmann & Winkelmann, 1998). Unemployment in a community further impacts on the life satisfaction of those who are employed, in particular for those living within regions where unemployment levels exceed the norm (Clark, 2003).

The problems of unemployment can be exacerbated for young people who face many difficulties as they try to enter and stay in the workforce, seeking to establish a sustainable career trajectory from a position of little or no work experience, with failure to find work exposing them to being "...at high risk for long-term social and economic exclusion" (Moore, 2019, p92). Furthermore, certain cohorts of young people are at greater risk of experiencing unemployment, and of experiencing longer periods of time where they are unemployed. Cohorts at greater risk include those who identify as Indigenous, those from low socio-economic communities, and those who have not completed year 12 schooling (Social Ventures Australia, 2016). Thus many programs seeking to reduce unemployment are specifically focused on the problem of youth unemployment, and the additional problems faced by disadvantaged youth (Social Ventures Australia, 2016).

Within Queensland, as is the case in most economies around the world, youth unemployment rates are generally found to significantly exceed the unemployment rates for adults. Within the state of Queensland, over the last decade (from Dec 2009 to April 2020) youth unemployment (defined by ABS as those aged between 15 and 24 years) has varied between 8.8% and 15.5%, with a mean rate of 12.1%³. This equates to 36,300 young people on average being

² Data for AMPTO Blue Army COTS control project for 2020 sourced from Queensland Government website, relating to Works Skills Traineeship 2019-2020 1st Funding Round Approved Projects (downloaded 20th January 2020): <https://desbt.qld.gov.au/training/community-orgs/funded/sqw/funded-projects>

³ Data relating to Australian labour force status for 15-24 year olds by State sourced from ABS website (downloaded 18th May 2020): <https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6202.0Apr%202020?OpenDocument>

unemployed at any particular time. The number and rate of unemployed youth across this time period can be seen in the graph set out at Figure 1.

The SQW initiative is one policy initiative adopted by the Queensland Government that seeks to reduce youth unemployment within the State. In this report, we focus on just one of the locally delivered programs within that initiative: the AMPTO “Blue Army” Youth Training Program. In seeking to assess the potential benefits of this program we focus more widely than the pure economic returns, seeking to consider the impact on both employment and the wellbeing outcomes for participants in the scheme. As the graduates from the AMPTO “Blue Army” program number around 30 per annum, the impact of such a scheme will not have an observable impact on unemployment rates within the State or the region; however, it can deliver an observable positive impact for those individuals who are able to benefit from the training.

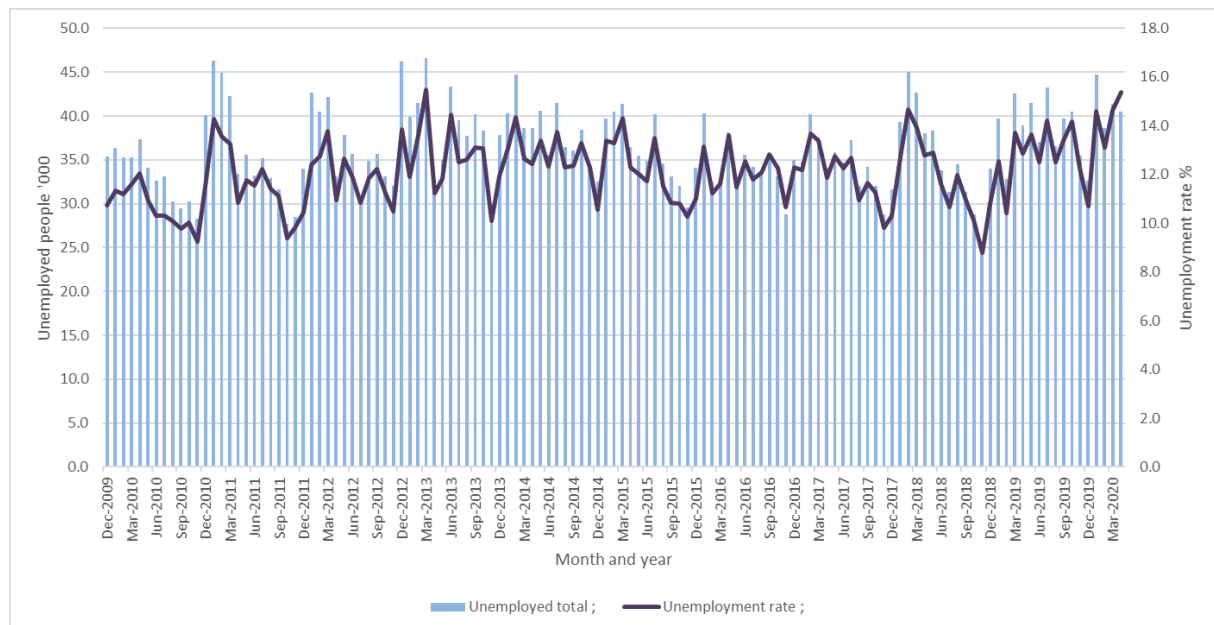


Figure 1: Youth unemployment numbers and youth unemployment rate in Queensland. Graph developed from data sourced from ABS website (downloaded 18th May 2020)
<https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6202.0Apr%202020?OpenDocument>.

1.3 Project aims

Our project sought to describe and quantify the social and economic benefits attributable to the AMPTO “Blue Army” program using mixed methods social and economic science. Using surveys of program graduates and analyses of other data (where available), we sought to determine (i) individual level and (ii) community level social and economic outcomes that can be attributed to the program. It is hoped that learnings from these analyses will help to inform decision making around future programs that seek to train, employ and empower Indigenous and non-Indigenous youth and associated communities.

2.0 METHODS

The primary method of data collection was an online survey of graduates, using the SurveyMonkey™ platform. Survey design considerations took account of advice from the program operators; that graduates typically had busy work/lifestyles and were often difficult to contact via telephone and email. Social media messaging was recommended as the most promising approach for survey recruitment.

After a failed first attempt (in October 2019) at achieving a sufficient sample, the survey was redesigned (i.e. made shorter, simpler) and an incentive was offered (i.e. a pre-paid gift card). The updated survey ran from the 4th of February 2020 until the 16th of March 2020 (with the final response received on the 13th of March), by which point Australian and International responses to the COVID-19 pandemic resulted in the rapid shutdown of tourism activities in the GBR and elsewhere. We note that on the 25th of March 2020, Queensland's Chief Health Officer issued a directive in relation to ceasing the operation of non-essential business, encompassing tourism operations in which many of the AMPTO program graduates were employed. The economic and social impacts of the COVID-19 pandemic response were still unfolding at the time of writing, and ***therefore the results in this report represent outcomes attributable to the AMPTO Blue Army program up until the March 2020 COVID-19 pandemic response.***

A Participant Information Sheet provided details on the research aims, the voluntary and anonymous nature of the survey, expected outcomes and ethical considerations (see Appendix 1). The project aims, approach and specific methods were reviewed and approved by CSIRO's *Social Science Human Research Ethics Committee* (CSSHREC; approval #028/19) in accordance with the National Statement on Ethical Conduct in Human Research (2007).

The focus of the survey (see Appendix 2) was to gather data from the graduates of the training scheme that represented two separate time periods. Firstly, we asked them to reflect on the 12-month time period prior to their participation, and secondly, we asked them to describe their status and perceptions at the present time (i.e. the time of the survey, after their graduation from the scheme). Comparable survey questions relating to both time periods encompassed a number of different domains of life, enabling comparisons of before and after the training, to enable the effects of the program on the graduates to be explored. We also sought insights on respondents' perceptions of the strengths and benefits of the scheme, enabling the scheme to be assessed from their perspective.

The survey data relating to the graduates of the training scheme is described and analysed in detail within Section 3, whilst in Section 4 we present an assessment of the project's impact, via a comparison of the outcomes of the graduates with an alternate group of individuals who were not involved in the scheme. This counterfactual analysis uses data gathered for the Household, Income and Labour Dynamics in Australia (HILDA) dataset⁴. The HILDA study has been running since 2001, and involves surveys of more than 17,000 Australians each year, collecting information about a wide range of economic, social and demographic factors. Of

⁴ HILDA is an Australian government initiative, managed by the Melbourne Institute of Applied Economic and Social Research at the University of Melbourne.

particular relevance to this research was the information collected relating to the life satisfaction of respondents and to their employment status, which can usefully be compared to the information we have collected from the graduates of the COTS training scheme. Further details on specific analyses and assumptions associated with these data are provided in Section 4.

3.0 RESULTS OF COTS TRAINING SCHEME PARTICIPANTS SURVEY DATA

3.1 Sample description

Prior to the cessation of operations by most GBR marine tourism operators in March 2020 in response to the COVID-19 pandemic, 42 graduates had completed the survey. A summary of the 42 respondents' relevant demographic details is provided in Table 1 (below). Most respondents (30 out of 42) resided in the Cairns region. The mean age of respondents was 22.2 (median = 20; range 18-36) and 58% were male (n=23/40 responses). Most had completed year 12 of high school (n=36/40; 90%), with only four respondents having completed up to year 10 (10%). Nine respondents (21%) identified as Aboriginal and/or Torres Strait Islander, seven (17%) of whom were of Torres Strait origin (NB. One respondent identified as both Aboriginal and Torres Strait Islander). Two respondents indicated that they identified with a Traditional Owner group of the GBR region. Respondents had graduated from the program between one and ten years prior (median of two years since graduation). Of the 42 respondents, 19 (45%) reported being in full-time employment, 16 (38%) reported being in part-time employment, and 7 (17%) reported being currently unemployed.

Table 1: Summary of respondent demographics (youth training program graduate online survey 2020)

Descriptive variable	Result (n=42)
Mean age ($\pm$ SE; range)	22.2 ($\pm$ 0.68; 18-36)
Gender (F:M; %)	42:58
Secondary education level attained (n; %)	Completed Year 12: 36 (90%) Completed Year 10: 4 (10%) No response: 2
Years since graduation from program (mean; range)	2.6 (range 1-10)
Identify as Aboriginal (n; %)	3 (7%)
Identify as Torres Strait Islander (n; %)	7 (17%)
Employment status (post-training, at time of survey; n; %)	Full-time: 19 (45%) Part-time: 16 (38%) Unemployed: 7 (17%)

3.2 Pre-enrolment circumstances

A series of questions were used to elicit details of individuals' circumstances prior to their enrolment in the youth training program. A number of these questions then provided a basis for pre–post-program comparisons.

Respondents were asked to select a category that best described their employment status in the 12 months prior to starting the training program. Most respondents indicated that they had been in some form of part-time employment (n=39; 93%), and three respondents (7%) indicated that they were unemployed. We note that being under-employed or unemployed was a prerequisite for acceptance to the program.

When asked “how did you first hear about the training program”, among the open-ended responses, 30 respondents (71%) indicated word-of-mouth, via friends, family and/or acquaintances. Social media was identified as the second most common method by which respondents first heard about the program (n=6; 14%). We then asked respondents to indicate the reason or motivation that led to their application to the program. Respondents were able to make multiple selections from four options, as multiple reasons were possible. Responses to this question are summarised in Table 2 (below).

The most common reason selected was “self-motivated, to improve my career prospects in general” (n=29; 69%), and a relatively high proportion (n=20; 48%) were encouraged to apply by friends and/or family. Thirteen respondents (31%) further indicated that they had friends or family who had (previously) participated in the training program. Six respondents (14%) indicated that they were self-motivated, to help get a specific job. Of the follow-up open-ended responses to a prompt that asked them to elaborate “which job”, one respondent indicated an interest in becoming a full-time COTS control diver, one wanted to become the skipper of a commercial marine vessel, two wanted to become scuba diving instructors, and one wanted to work in the marine tourism and/or fishing sector.

Table 2: Reasons/motivation for applying to the program

Motivation / reason for applying	n (%)
Was encouraged by friends or family	20 (48%)
Have friends or family who had done the training	13 (31%)
Self-motivated, to improve my career prospects in general	29 (69%)
Self-motivated, to help get a specific job	6 (14%)

Life satisfaction

Respondents were asked: “How satisfied were you with your life, overall, in the 12 months before you began the training program?” A ten-point rating scale was provided (1=very unsatisfied, 10=very satisfied), followed by an open-ended optional prompt, asking “can you briefly explain why you felt this way?” The mean satisfaction score was 5.9 (± 0.33 SE), and response ratings were distributed across most of the scale (Figure 2 below). Among those who

provided a low score (rating of 5 or below), open-ended responses were reflective of their employment status and career outlook. For example:

- *“Dead end job, no life goals just over all didn’t know what I was doing in life.”*
- *“I had just graduated high school, and had no plans for my future.”*
- *“No career opportunities seemed present around Cairns.”*
- *“I had no income.”*
- *“Finding it hard to find a job.”*
- *“I felt like I didn’t have a career I could work towards.”*

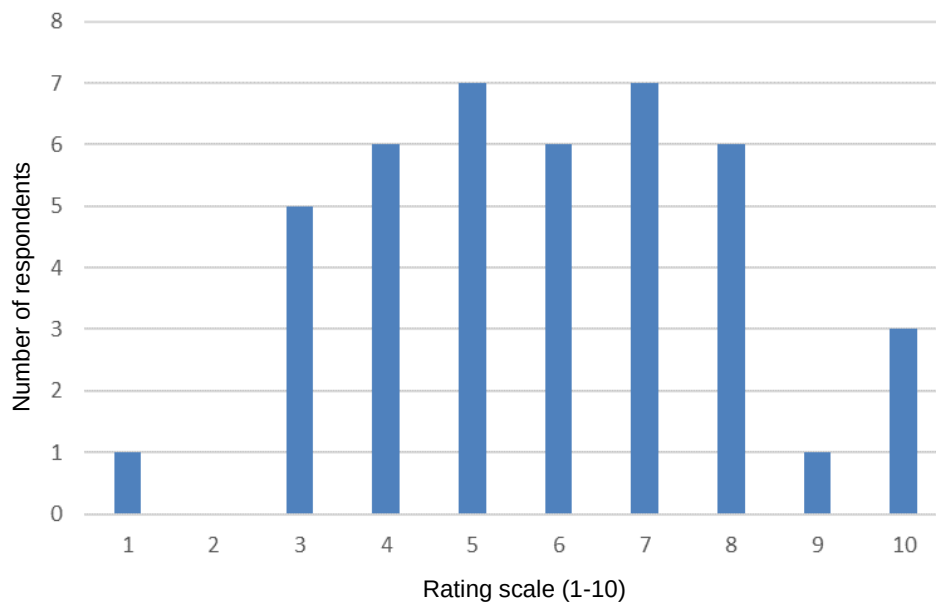


Figure 2: Distribution of ‘life satisfaction’ ratings for the 12-months prior to training (n=42; response scale 1=very unsatisfied, 10=very satisfied).

Among those who provided a relatively high score (rating of 6 or above), open-ended responses were generally reflective of their career aspirations at that life stage. For example:

- *“I was unsure of what direction I wanted to go in.”*
- *“I wasn’t working in any field remotely close to my study of wildlife biology.”*
- *“I had just graduated high school and was very happy with my success however still was unsure as to what I was going to do next.”*
- *“I just graduated high school so I was extremely keen to work and become an adult.”*
- *“Already worked on the reef, wanted dive cert.”*

3.3 Program satisfaction

Respondents were asked: “How satisfied are you with the training you received from the COTS control training program?” A ten-point rating scale was provided (1=very unsatisfied, 10=very satisfied), followed by two open-ended optional prompts, asking (i) “What was your favourite part of the training program?” and (ii) “Are there any parts of the training program that weren’t so good?” The mean satisfaction score was 9.7 out of ten (± 0.12 SE), and the distribution of response ratings were strongly positively skewed (Figure 3 below).

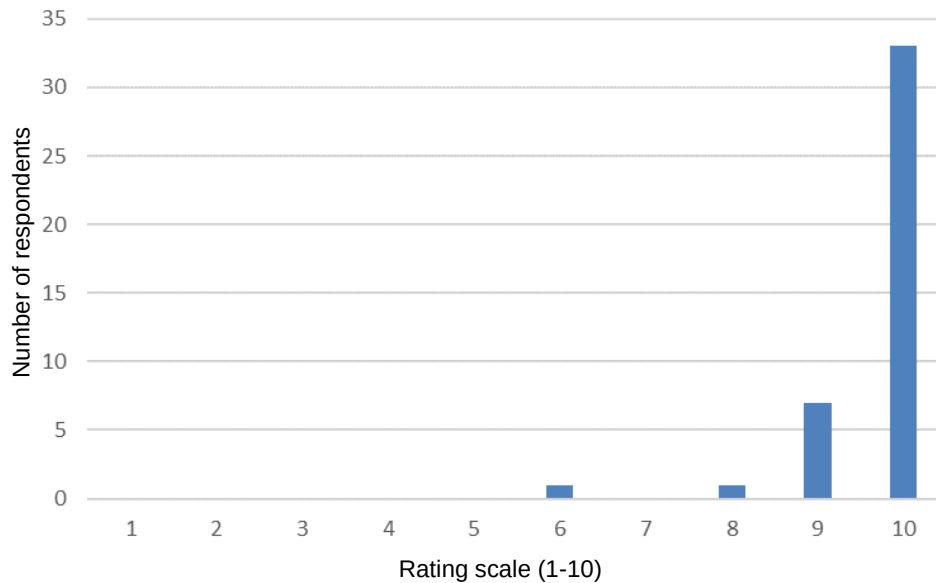


Figure 3: Distribution of training program satisfaction ratings (n=42; response scale 1=very unsatisfied, 10=very satisfied).

A large proportion of the comments provided about respondents’ favourite part of the program were reflective of the learning experience, skills acquired, social and networking opportunities, and about their personal development journey. Example responses included:

- *“Boats and working away from home taught me how to become more independent.”*
- *“I learnt a lot about time management on the trips we took to rid of the COTS, learnt a lot about the reef that I had no idea about, learnt how to push my body to do things I never thought I could and it made me the worker I am today.”*
- *“Learning not only how to find COTS but to also find yourself. Pushing your limits to gain confidence in different areas.”*
- *“Getting to experience a whole new industry I never knew I’d fit into so well. Also opening my eyes to my potential.”*
- *“The learning experience, both on research vessels and tourism operators. Learning a variety of skills that have turned my life around.”*
- *“Getting a foot in the dive industry. Would not have known how easily achievable a diving job would be if I had not done the traineeship.”*
- *“Learning how to take control in stressful situations.”*
- *“Making new friends but mainly gaining newfound confidence I never had in myself before.”*

- *“Building my confidence in speaking in big groups & learning a lot about the reef, meeting people from around the world & experiencing diving.”*
- *“I enjoyed learning a new skill such as diving and understanding how it works.”*
- *“Coming out of my shell.”*
- *“Working on the tourist boats and meeting new people.”*
- *“Learnt important life skills, met amazing people, gained self-confidence.”*

Respondents were then asked: “Are there any parts of the training program that weren’t so good?” More than half of the respondents (n=22; 52%) indicated that there were no such parts, and a further five provided no response. Example responses that identified particular aspects of the program included:

- *“All the paperwork sometimes wasn’t the most interesting.”*
- *“Having to find another job after the training and not continuing working for the COTS program.”*
- *“I feel that we didn’t spend enough time on first aid.”*
- *“I felt that the program was a bit rushed.”*
- *“Public speaking.”*
- *“The unrelated but compulsory business certificate.”*

3.4 Respondents’ self-reported changes post-program

A series of five-point rating scale questions were asked, for respondents to indicate agreement/disagreement (1=disagree strongly; 5=agree strongly) with corresponding statements about their personal attitudes and perceptions. Early in the survey, the statements were framed to reflect their perceptions and attitudes in the 12 months prior to commencing the youth training program. Later in the survey, re-framed versions of the statements were posed to elicit respondents’ perceptions and attitudes at the present moment (i.e. after graduating from the program).

Below we provide a comparison of the ratings for these ‘before and after’ statements to indicate life changes that may be (partly) attributable to their participation in the program. The complete wording for all statements is provided in Appendix 2.

Employment confidence and work motivation

Respondents were asked to provide ratings for the statements:

- (i) “I was/am confident that my future employment prospects were/are good” (*employment confidence*), and
- (ii) “I was/am highly motivated to work hard to achieve success” (*work motivation*).

The mean rating score for *employment confidence* for the period ‘before the program’ was 3.0 out of 5 (± 0.15 SE), and the mean rating for ‘after the program’ was 4.6 (± 0.09 SE), representing an increase (statistically significant at 1% level) of 1.6 points (see Figure 3 below). Of the 42 respondents, 37 (88%) provided an increased score from ‘before’ to ‘after’, while three respondents’ ratings were unchanged, and two respondents gave a lower rating.

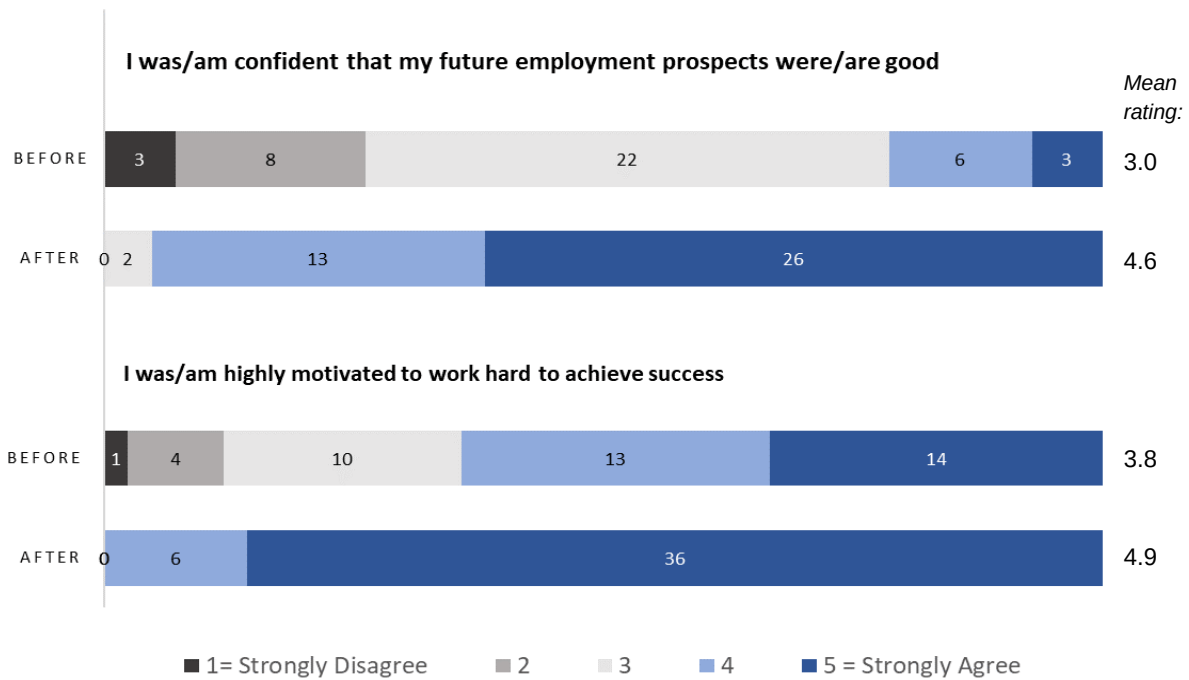


Figure 4: ‘Before and after’ comparison of self-assessed employment outlook and work motivation (n=42; agreement response scale 1=strongly disagree, 5=strongly agree).

For *work motivation*, the mean rating score for the ‘before’ period was 3.8 (± 0.16 SE), and the mean rating for ‘after’ was 4.9 (± 0.05 SE), representing an increase of 1.1 points (Figure 4). Twenty-four respondents (57%) provided an increased score from ‘before’ to ‘after’, while 18 respondents’ ratings were unchanged.

GBR knowledge, career aspirations and stewardship sentiment

Respondents gave ratings of agreement/disagreement for the following statements:

- (iii) “I cared/care about the health of the GBR and the natural environment” (*GBR stewardship sentiment*),
- (iv) “I wanted/want to have a professional career in the GBR” (*GBR career aspirations*), and
- (v) “I knew/have learned a lot about the GBR, its ecology and threats” (*GBR knowledge*). *NB. Before and after comparisons of actual knowledge were not possible due to the altered terminology from before to after.*

The mean rating score for *GBR stewardship sentiment* for the period 'before the program' was 3.7 out of 5 (± 0.20 SE), and the mean rating for 'after the program' was 4.9 (± 0.05 SE), representing an increase of 1.2 points (see Figure 5 below). Twenty-four respondents (57%) provided an increased score from 'before' to 'after', and 18 respondents' ratings were unchanged.

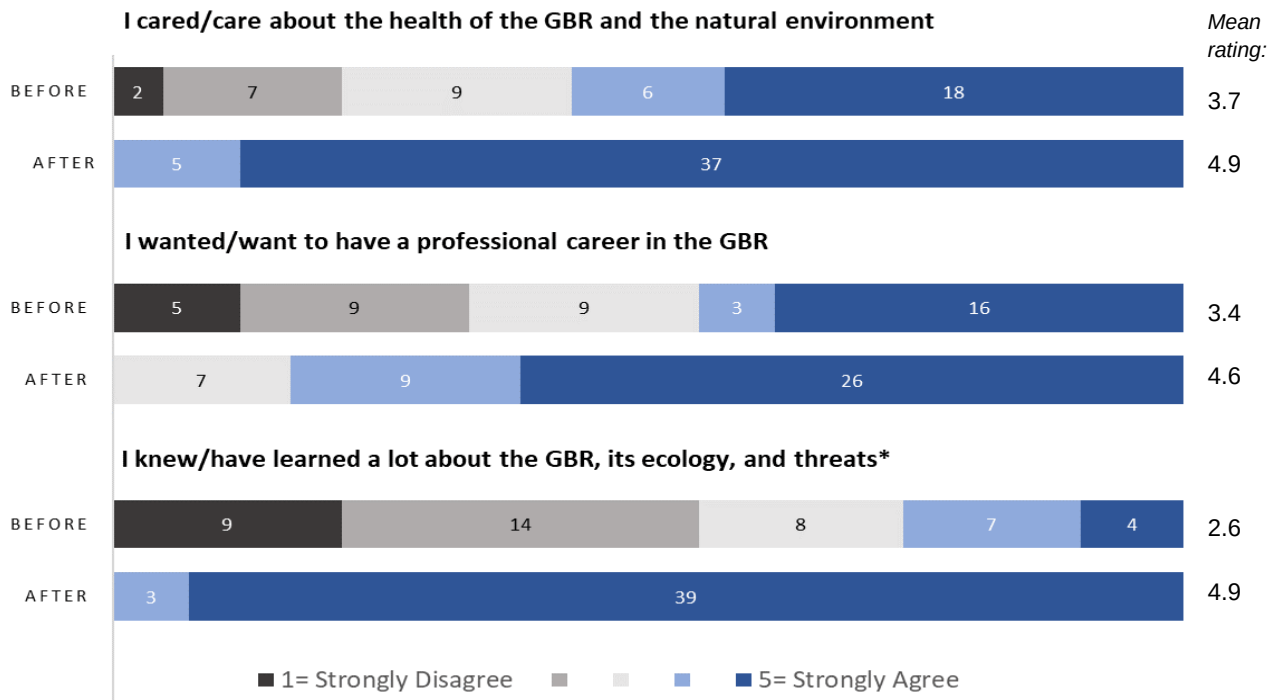


Figure 5: 'Before and after' comparison of self-assessed GBR knowledge, aspirations and stewardship sentiment (n=42; agreement response scale 1=strongly disagree, 5=strongly agree; *NB. due to the different question wording, comparisons between the before and after periods for this particular question are not considered appropriate).

For *GBR career aspirations*, the mean rating score for the 'before' period was 3.4 (± 0.22 SE), and the mean rating for 'after' was 4.6 (± 0.11 SE); an increase of 1.2 points (Figure 5). Twenty-three respondents (55%) provided an increased score from 'before' to 'after', while 17 respondents' ratings were unchanged, and two respondents gave a lower rating. While direct comparisons of the statements reflecting *GBR knowledge* were not possible (as noted above), there was overall strong agreement with the statement "I have learned a lot about the GBR, its ecology and threats", with a mean rating of 4.9 out of 5 (± 0.04 SE).

Community standing and reputation

Respondents provided ratings of agreement/disagreement for the following statements:

- (i) "People in my community saw/see me as a role model for other young people" (*perceived community standing*), and
- (ii) "Other people could/can rely on me for help" (*perceived personal reputation*).

The mean rating score for *perceived community standing* for the period 'before the program' was 3.2 out of 5 (± 0.17 SE), and the mean rating for 'after the program' was 4.1 (± 0.13 SE),

representing an increase of 0.9 points (see Figure 6 below). Twenty-seven respondents (64%) provided an increased score from 'before' to 'after', and 15 respondents' ratings were unchanged.

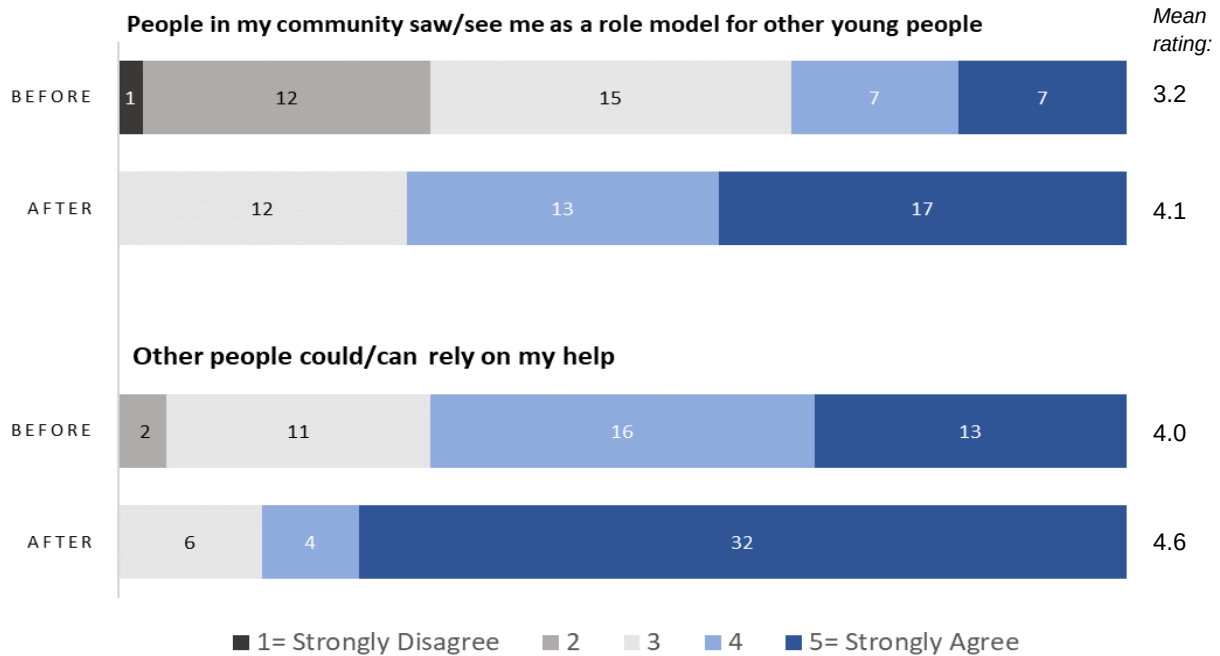


Figure 6: 'Before and after' comparison of perceived community standing and personal reputation (n=42; agreement response scale 1=strongly disagree, 5=strongly agree).

For *perceived personal reputation*, the mean rating score for the 'before' period was 4.0 (± 0.13 SE), and the mean rating for 'after' was 4.6 (± 0.11 SE); an increase of 0.6 points (Figure 6). Twenty-three respondents (55%) provided an increased score from 'before' to 'after', while 17 respondents' ratings were unchanged, and two respondents gave a lower rating.

Cultural pride and place identity

Respondents rated their agreement/disagreement with the following statements:

- (i) "I was/am proud of my country, culture and heritage" (*cultural pride*), and
- (ii) "I felt/feel a strong personal connection to the GBR (or to my sea country)" (*place identity*).

The mean rating score for *cultural pride* for the period 'before the program' was 4.0 out of 5 (± 0.15 SE), and the mean rating for 'after the program' was 4.6 (± 0.13 SE), representing an increase of 0.6 points (see Figure 7 below). Nineteen respondents (45%) provided an increased score from 'before' to 'after', and 23 respondents' ratings were unchanged. Among those respondents who identified as Aboriginal and/or Torres Strait Islander (n=9), only two reported an increased score from 'before' to 'after', and the ratings were unchanged for the remaining seven.

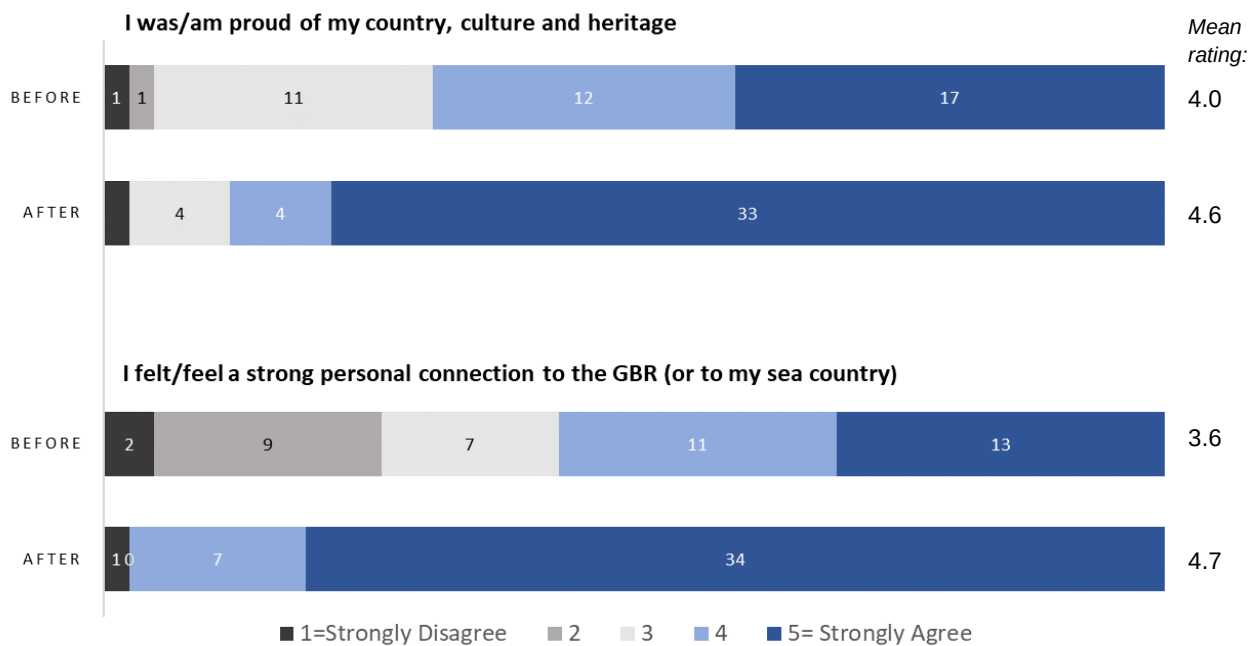


Figure 7: 'Before and after' comparison of cultural pride and place identity (n=42; agreement response scale 1=strongly disagree, 5=strongly agree).

For *place identity*, the mean rating score for the 'before' period was 3.6 (± 0.20 SE), and the mean rating for 'after' was 4.7 (± 0.11 SE); an increase of 1.1 points (Figure 7). Twenty-seven respondents (64%) provided an increased score from 'before' to 'after', while 14 respondents' ratings were unchanged, and one respondent gave a lower rating. Among the nine respondents who identified as Aboriginal and/or Torres Strait Islander, five reported an increased score from 'before' to 'after', and the ratings were unchanged for the remaining four; noting that these ratings were all five out of five.

Self-efficacy and speaking confidence

Respondents gave agreement/disagreement ratings for the following statements:

- (i) "I was/am proud of my skills and abilities" (*self-efficacy*), and
- (ii) "I was/am a confident speaker in the company of adults outside my family and friends" (*speaking confidence*).

The mean rating score for *self-efficacy* for the period 'before the program' was 3.2 out of 5 (± 0.17 SE), and the mean rating for 'after the program' was 4.8 (± 0.07 SE), representing an increase of 1.6 points (see Figure 8 below). Thirty-three respondents (79%) provided an increased score from 'before' to 'after', and nine respondents' ratings were unchanged.

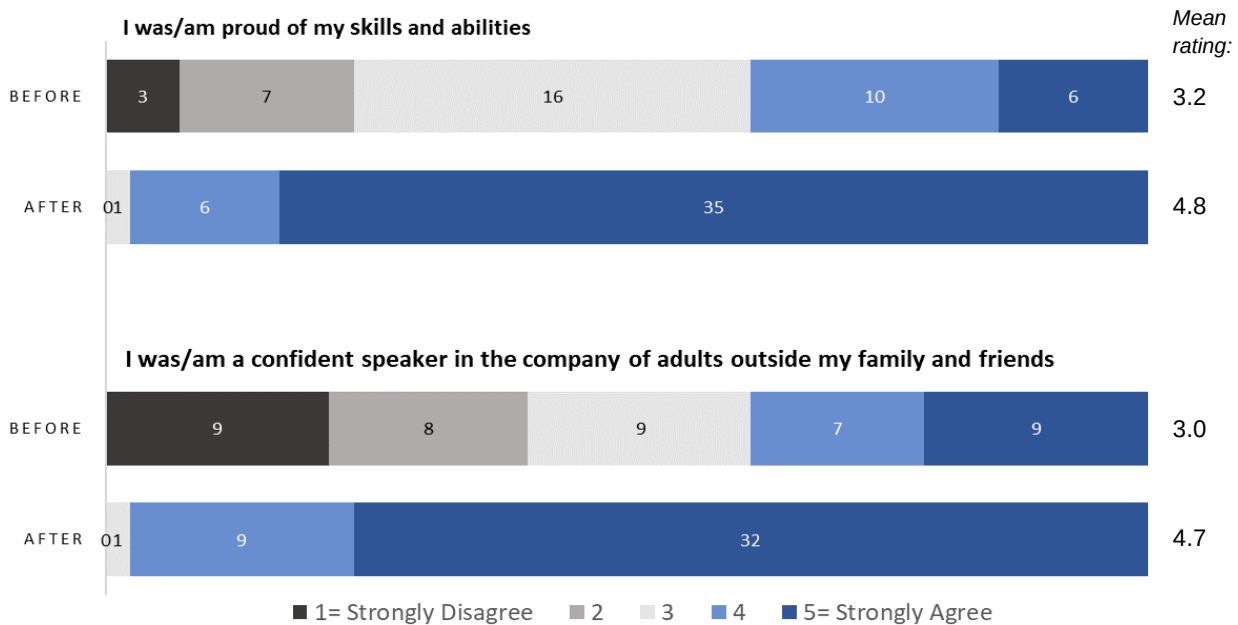


Figure 8: 'Before and after' comparison of personal pride/self-efficacy and speaking confidence (n=42; agreement response scale 1=strongly disagree, 5=strongly agree).

For *speaking confidence*, the mean rating score for the 'before' period was 3.0 (± 0.22 SE), and the mean rating for 'after' was 4.7 (± 0.08 SE); an increase of 1.7 points (Figure 8). Thirty-two respondents (55%) provided an increased score from 'before' to 'after', while ten respondents' ratings were unchanged.

Support networks, stress and financial wellbeing

Respondents provided agreement/disagreement ratings for the following statements:

- (i) "I had/have a strong network of people (e.g. family, friends) who support(ed) me through hard times" (*support networks*),
- (ii) "I often felt/feel worried or stressed" (*stress*), and
- (iii) "I could/can afford to buy things I like(d)" (*financial wellbeing*).

The mean rating score for *support networks* for the period 'before the program' was 3.9 out of 5 (± 0.20 SE), and the mean rating for 'after the program' was 4.7 (± 0.10 SE), representing an increase of 0.8 points (see Figure 9 below). Twenty respondents (48%) provided an increased score from 'before' to 'after', and 22 respondents' ratings were unchanged.

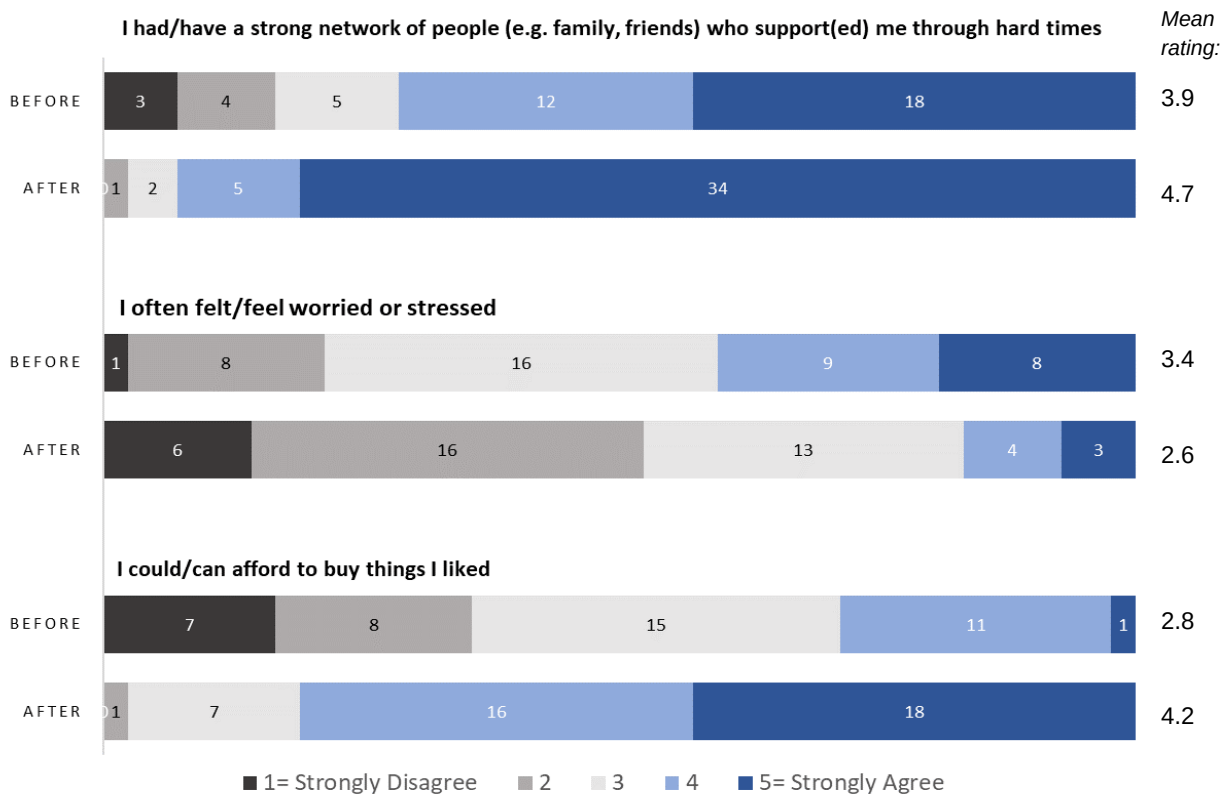


Figure 9: 'Before and after' comparison of support networks, stress levels and financial wellbeing indicators (n=42; agreement response scale 1=strongly disagree, 5=strongly agree).

For *stress*, the mean rating score for the 'before' period was 3.4 (± 0.17 SE), and the mean rating for 'after' was 2.6 (± 0.17 SE); a decrease of 0.8 points (Figure 9). Twenty-six respondents (62%) provided a decreased *stress* rating score from 'before' to 'after', while seven respondents' provided an increased *stress* rating. The ratings were unchanged for nine respondents. For *financial wellbeing*, the mean rating score for the 'before' period was 2.8 (± 0.17 SE), and the mean rating for 'after' was 4.2 (± 0.13 SE); an increase of 1.4 points (Figure 9). Thirty-three respondents (79%) provided a higher rating score from 'before' to 'after'; five indicated no change, and four respondents' provided a decreased rating.

Life satisfaction

Respondents were asked: "How satisfied were you with your life, overall, at the present stage?" The ten-point scale described above (cf. Section 3.2; 1=very unsatisfied, 10=very satisfied) was used, enabling a comparison of self-reported life satisfaction before and after participation in the youth training program. The question was again followed by an open-ended optional prompt, asking "If the score has changed compared to Question 5 (satisfaction before the training program) can you explain briefly why?" The mean satisfaction score for respondents at the present time (i.e. post-program) was 8.6 (± 0.20 SE), which was 2.7 points higher than the previous life satisfaction rating. A comparison of the distribution of response ratings before and after the program is shown below (Figure 10).

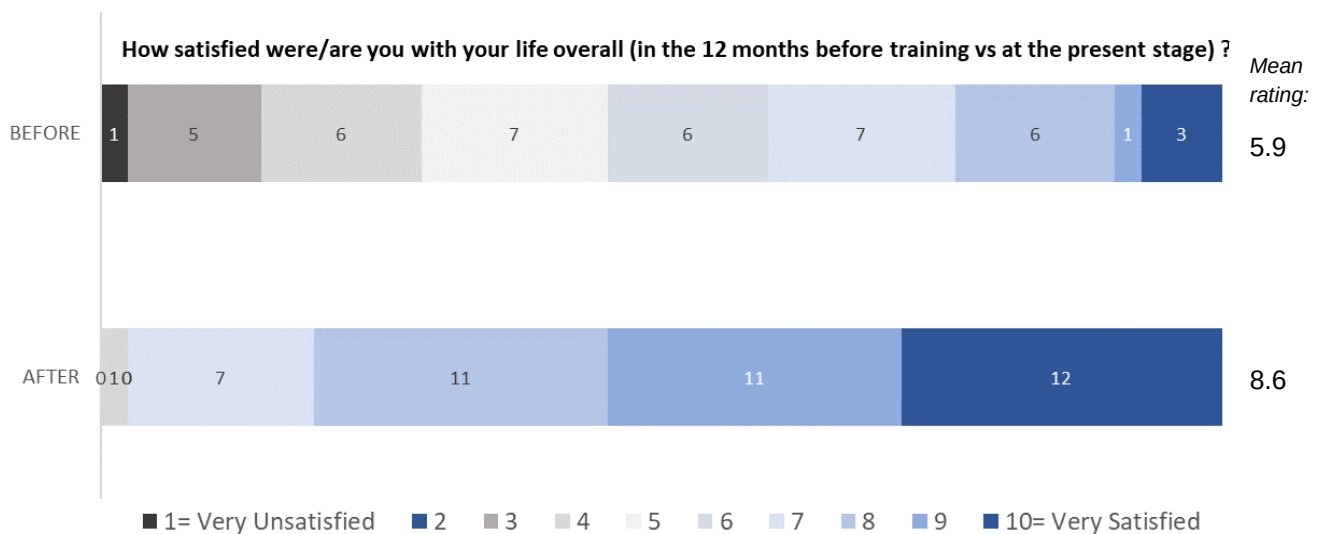


Figure 10: ‘Before and after’ comparison of life satisfaction rating (n=42; rating scale 1=very unsatisfied, 10 = very satisfied).

Sixteen respondents provided a follow-up open-ended explanation of their rating score. Most comments were reflective of an improved career outlook, self-confidence and job satisfaction. For example:

- *“I’m motivated, I’ve met a number of life-long friends, I’ve found a passion in reef conservation, and I absolutely love the lifestyle of working in tourism.”*
- *“I now have a consistent income with a job that I love.”*
- *“I enjoy what I’m doing for a living and actually have something to work towards.”*
- *“I have my dream job and now can see my future more clearly.”*
- *“I’m in a career I love and also I can see myself progressing in, in general I have ambitions now.”*
- *“I have a new job on the reef and I’m loving it.”*
- *“Have a far better job now, full time, good money.”*
- *“I have grown more as a person and more confident in myself.”*

Employment status

Respondents were asked to describe their employment status in the 12 months period prior to the training course, and again at the present (i.e. time of survey). The responses were coded to a three-point scale where 1=unemployed, 2=employed part time and 3=employed full time. This enabled a simple comparison of the employment status of the graduates before and after participation in the youth training program. The mean employment status score for respondents at the present time (i.e. post-program) was 2.3 (± 0.11 SE), which was 0.6 points higher than prior to the training program. A comparison of the distribution of response regarding employment status before and after the program is shown below (Figure 11).

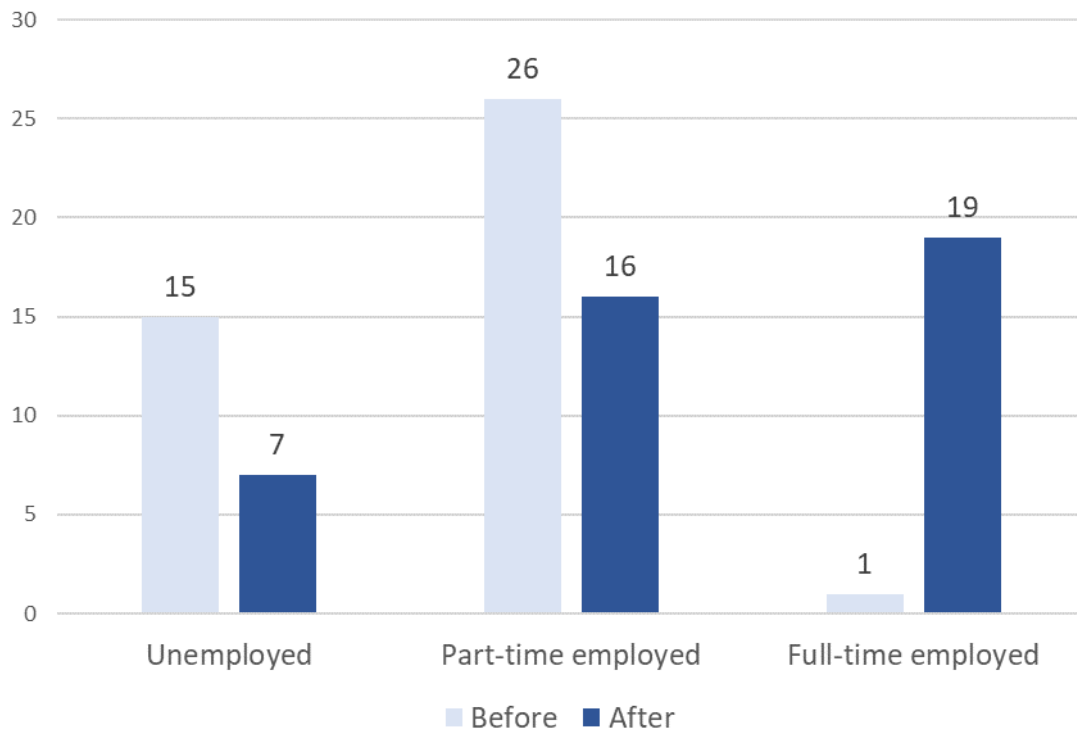


Figure 11: 'Before and after' comparison of employment status (n=42)

3.5 Program reflections

After completing the series of 'before and after' rating scale questions, respondents were asked: *"Considering the statements above, have there been there any significant changes in your life or career plans that you would attribute directly to your participation in the COTS control training program? If so, please describe briefly."* While two respondents gave a short answer "no", most open-ended responses (n=33) were positive, and were generally reflective of improved knowledge and skills, career aspirations, self-confidence, networks, and job satisfaction. For example:

- *"My overall health, mental and physical. My connections with family and friends have improved. My overall outlook on life. And my new skills."*
- *"The program helped me realize that I'd like a career in the marine industry. Ideally I'd be open to working for the COTS program anytime in the future."*
- *"When I graduated from high school I applied for university but was rejected. After doing the COTS control training program I applied once again for the same degree whilst including the training in my resume and was accepted. [identifying details removed] I believe if it wasn't for the COTS program I wouldn't have been able to go to university."*
- *"Yes due to my quals from the program I have also opportunities in other industries."*
- *"Confidence I gained and the trainers helping me to be what I wanted to be. Also knowing I could call on them if I ever needed a hand."*
- *"Everything about my future and career are because I did the COTS program. It honestly saves my life and I have a lot to thank for it."*
- *"I believe that I now have a plan for the future and goals I want to achieve"*

- *"Yes, especially getting the job I have now with [identifying details removed]. It's because I participated in the program I got to work with the crew there and show I was worth their time."*
- *"Yes, I have made so many life-time connections and the memories from the COTS program are memories I'll cherish forever."*
- *"Yes. Throughout the program, I've learnt so much about the GBR and the marine life. I've gained skills and knowledge and I know for a fact that it will help me in life."*
- *"I would have never considered the dive industry as a career if I hadn't done the traineeship. Have learnt a great deal about boats and made some lifelong friends along the way. It has definitely altered my life for the better."*
- *"I am in a career that I love and never would've gotten into it without the program."*
- *"Knowing and caring more about the GBR."*
- *"100% this program is the best opportunity I have ever been given. It taught me everything I am passionate about. The water feels like my new home and my co-workers feel like a family. [identifying details removed] became my role models in so many aspects."*
- *"It got my foot in the door with many companies and opportunities it also gave me the skills and knowledge to work effectively and safely on a boat."*
- *"More confidence, a sense of accomplishment."*
- *I have gained so much self-confidence which I directly relate to the COTS program. Even though I do not plan on working on the GBR long term, the program has helped develop my love for the tourism industry, and also foreign languages which I will be exploring at the end of this year as I am moving to [identifying details removed]. Without the COTS program I'm unsure I would have had the confidence to do this."*

4.0 RESULTS FROM ESTIMATION OF THE IMPACT OF THE COTS TRAINING SCHEME COMPARED TO THE COUNTERFACTUAL

4.1 Estimation of the impact of a policy intervention

There is growing recognition that the development of social policies and programs become more strongly evidence-based; in particular, those directed towards Indigenous or disadvantaged communities (Muir & Dean, 2017). However, relatively few social programs conduct and publish empirical evaluations that verify the delivery of the intended outcomes (Day & Francisco 2013). This is partly due to the complexity of the evaluation process for programs that seek to address complex and/or entrenched social problems. Nonetheless, evaluating such programs and compiling evidence of their effectiveness is vital for ensuring future program development optimizes outcomes from the resources invested (Muir & Dean, 2017). Accordingly, our aim is to assess the impact and effectiveness of one such social program: the COTS youth training scheme.

To evaluate the impact of the COTS training scheme on disadvantaged young people of the region, we sought to estimate what the outcome would be for young people with or without exposure to the training scheme. We consider two different aspects of the outcome – firstly, the impact of the training scheme on the self-reported *life satisfaction* of young people, and secondly, the impact of the training scheme on the *employment status* of young people.

When seeking to understand the impact that a program has had on outcomes, we are seeking to determine what change in outcomes can be attributed to the program rather than to other factors. Ideally we would be able to compare (i) the outcome that occurred due to the training program, with (ii) that which would have occurred without the training program – that is comparing an outcome to the counterfactual, as shown in Figure 12.

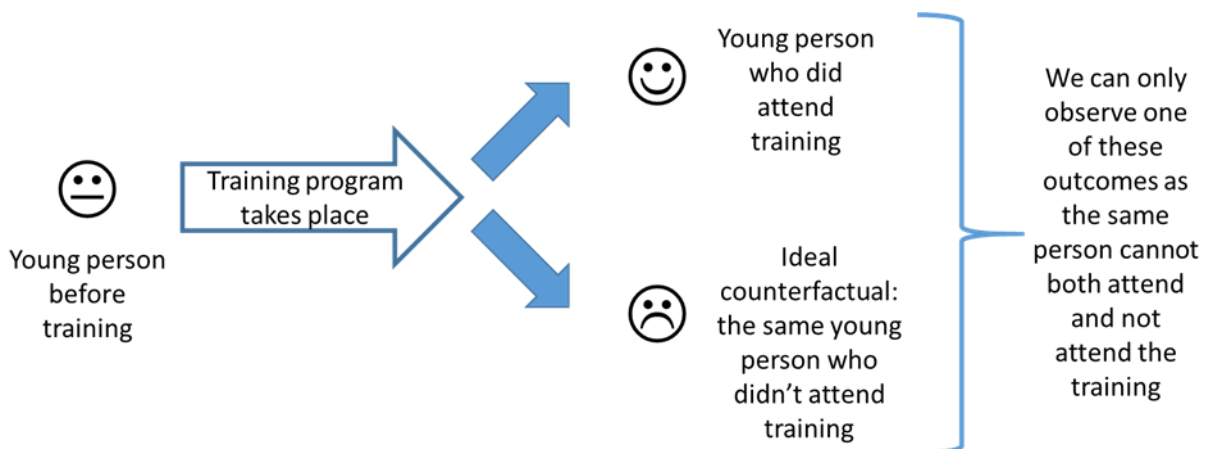


Figure 12: Illustrating why the counterfactual cannot be observed

Our problem with trying to evaluate the impact of the training scheme by comparing the outcome of attending the training with not attending is that the counterfactual is unobservable; i.e. the two potential outcomes cannot be observed for any one individual. For any particular person we cannot compare the two outcomes, as each person has either attended or has not. A solution to this problem could be to conduct a randomized control trial, where a group of subjects are selected for study and randomly allocated to a group that either does or does not receive the intervention (in this case the training program) but unfortunately in the real world such an approach is rarely possible. Instead, an alternate approach is to conduct an analysis based on observation data where we compare the average outcomes for those individuals that received training to the average outcomes for those individuals that did not. This is described as estimating the *average treatment effect*.

4.2 Estimation of the average treatment effect – a general approach to program evaluation

Mathematically this approach can be written as:

$$ATE = E[Y_i(1) \mid T_i = 1] - E[Y_i(0) \mid T_i = 0]$$

Where:

- ATE is the average treatment effect – that is the average effect resulting from attending the training
- E specifies that the function is an expectation, in effect for our observational data this provides the average
- Y_i indicates the outcome for individual i if i attended the training scheme ($Y_i=1$) or did not attend the training scheme ($Y_i=0$)
- T_i indicates whether the individual i did attend training ($T_i=1$) or did not ($T_i=0$)

More simplistically, this mathematical function describes the average treatment effect (ATE)(from attending the training) as the difference between (i) the average outcome (from attending training) among those who did receive the training, and (ii) the average outcome (in the absence of training) amongst those who didn't receive the training. Several problems can arise when we attempt to estimate the model, using data that has not been derived from a randomized control trial: the key problem being omitted variable bias or endogeneity. Simplistically, this problem arises if the people who choose to participate in the training program possess different characteristics to those who do not chose to participate, and thus some (or all) of the difference in outcomes could be due the different characteristics that determine participation rather than having arisen as the result of participation in the training program. As the analysis is inevitably based on the use of an imperfect counterfactual then some bias in estimation would appear to be inevitable, and the size of the bias cannot be calculated as we cannot determine the true counterfactual. However, some statistical approaches can help to compensate for this issue. That is, by adopting specific statistical techniques we reduce the risk that our estimate of the impact of participating in the training program will be biased. There are several methods that can be used to estimate average treatment effects, and for this work we adopted the *difference in difference* method, as described below.

4.3 Difference in difference with regression method – specific method adopted to evaluate the COTS training program

This method seeks to resolve the problem of imperfect counterfactuals that arises in comparisons of data from separate groups of respondents: one group of individuals who have experienced the treatment (in this case the COTS training program), and another group who have not experienced the treatment.

Successful application of the method required that a number of conditions are met, as follows:

- Whilst it is assumed that there is unobserved heterogeneity between individuals within and between the two groups, it is also assumed that the heterogeneity is time-invariant. Thus the differences in characteristics between individuals are not expected to change over time. Additionally, this requires the assumption that there is no alternate treatment (i.e. other program(s)) in place that could also be influencing the outcome variables for one group compared to the other, as the method would not be able to identify the separate impacts of the alternate treatments.
- Data is required for individuals who have and have not participated in the program for two time periods – before the training program and after the training program, and this data requires fairly stable observation of individuals. Thus, a balanced panel of data is required, with pre and post training program observations available for the same individuals.

Provided this data is available then the method can control for initial differences between the treatment group (those that participated in training) and the control group (those that didn't) and thus offer an estimate of the impact of the treatment (training) on the output variable(s) of interest.

The *difference in difference* estimator seeks to measure the change in the outcome variable post and pre-training for those who received the training relative to the change in outcome variable at post and pre training times for those who did not receive the training. Simplistically, the method is assuming that the trend demonstrated in the control group (no training) will approximate to the trend that would have occurred in the treatment group (training) if instead they hadn't actually participated in that training. This is illustrated in Figure 13.

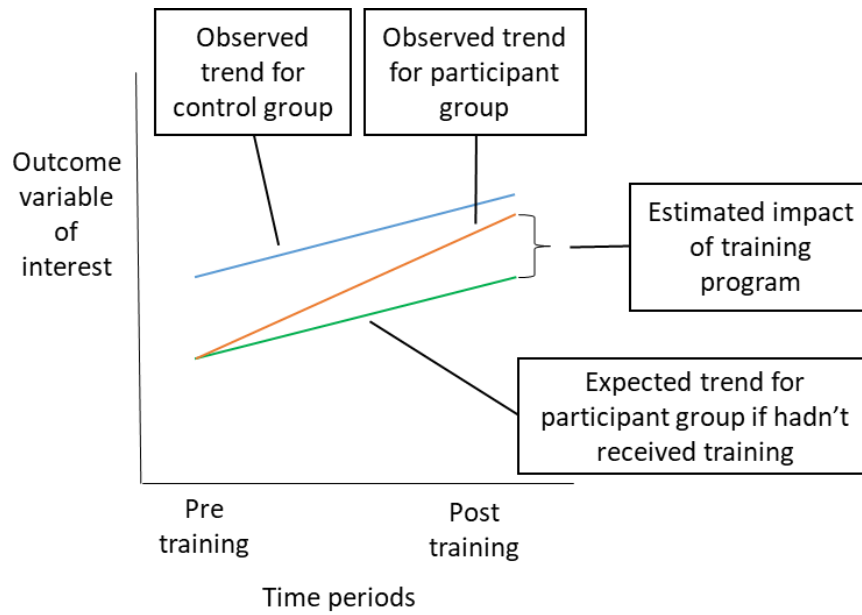


Figure 13: Illustration of principle underpinning the difference in difference estimator

This method specifically seeks to estimate the following model:

$$Y = \beta_0 + \beta_1 DPost + \beta_2 DTr + \beta_3 DPost * DTr [+ \beta_4 X] + \varepsilon$$

Where:

- Y is the outcome of interest
- DPost is a dummy⁵ variable indicating time periods, equal to 1 for period after training and equal to zero for time period before training
- DTr is a dummy variable indicating treatment group, equal to 1 for those who participated in the training program and equal to zero for those who did not
- DPostDTr is an interaction dummy, representing the value of DPost multiplied by DTr, thus will equal 1 for observations relating to those who participated in the training and relate to time period after training, otherwise being zero.
- X is an optional vector of control variables. These serve to control for differences in characteristics between the participant group and the control group. The particular variables included within this vector for this study are discussed further within the next section.

The coefficient of interest in this model is β_3 , this is our difference in difference estimator, providing an estimate of the impact of the COTS training program.

⁵ Dummy variables are a particular type of categorical variable, being dichotomous variables that take the value of 1 or 0 to indicate the presence or absence of the condition of interest.

4.4 Data used to estimate the model

The first part of the equation $E[Y_i(1) \mid T_i = 1]$ refers to the outcomes from those who attended training, and thus the survey data collected from the COTS training scheme graduates can be used for these observations. The second part of the equation $E[Y_i(0) \mid T_i = 0]$ refers to our counterfactual: this is the data that in reality is hard to find.

For this study we have utilized data from the Household, Income and Labour Dynamics in Australia (HILDA) survey⁶. HILDA has surveyed more than 17,000 Australians each year since 2001, collecting information about a wide range of economic, social and demographic factors, including, importantly, information relating to the life satisfaction of respondents and to their employment status. By selecting a sub-set of HILDA respondents based within the region of Queensland from which COTS training scheme participants are drawn, this analysis compares the outcomes experienced by the COTS training graduates with that of the HILDA respondents, allowing insights to be drawn regarding the impact that the training program has had on those participants.

The HILDA dataset has been widely used by researchers for a many different purposes, including investigations into the impact of training schemes (Daly & Gebremedhin, 2015; Daly, Gebremedhin, & Sayem, 2013) and investigations into life satisfaction (Ambrey & Fleming, 2014). Thus, the dataset appears appropriate for use in our analysis. However, whilst the HILDA dataset fits many of the criteria as a good source of counterfactual data for this study there is one key weakness: the latest available HILDA data was collected during the period from 31 July 2018 to 10 February 2019. As our COTS graduate survey was administered in February and March 2020, the time periods covered by the datasets are not an exact match. Whilst this is a limitation to our analysis, no other alternative dataset was available that provided a better match. We therefore advise caution in the interpretation and communication of our comparative results. We do note however, that while our survey was conducted in February 2020, many of the graduates left the program prior to or during the corresponding HILDA survey period and hence their responses were likely influenced by their experiences during that period.

The subset of HILDA data utilized in this analysis was selected seeking to match characteristics to the COTS trainees where possible, and thus was selected in the following manner:

- The geographic regions from which the HILDA survey respondents were selected is shown in the map at Figure 14. The regions selected were those ABS statistical regions that form the Eastern Queensland coastline adjacent to the Great Barrier Reef, being ABS SA4 regions for Fitzroy, Mackay, Townsville and Cairns, and the ABS SA3 region of Far North Queensland. In addition to trying to match the treated

⁶ This study uses unit record data from the Household, Income and Labour Dynamics in Australia Survey (HILDA) conducted by the Australian Government Department of Social Services (DSS). The findings and views reported in this paper, however, are those of the author[s] and should not be attributed to the Australian Government, DSS, or any of DSS' contractors or partners. While the HILDA Survey is funded by the Australian Government Department of Social Services, it is managed by the Melbourne Institute of Applied Economic and Social Research at The University of Melbourne, which in turn sub-contracts the data collection to Roy Morgan Research. More information on HILDA can be found at <https://melbourneinstitute.unimelb.edu.au/hilda> and details of the dataset are set out with the HILDA user manual (Summerfield et al., 2019).

and untreated datasets as closely as possible, geographic controls are necessary as different factors have been found to be relevant to life satisfaction depending on the location of the survey respondent (Kubiszewski, Jarvis, & Zakariyya, 2019).

- HILDA data for respondents relating to age, gender, level of schooling and Indigenous status, both as an attempt to match the treated and untreated datasets as closely as possible, and also reflects that these factors have frequently been found to affect self-reported life satisfaction (Kubiszewski, Zakariyya, & Costanza, 2018). Thus the inclusion of these variables acts both as a control for differences between the two data sets, whilst also acting as predictor variables in their own right for life satisfaction scores and employment status.
- HILDA respondents were only included if aged 36 or less at the latest survey date, as the eldest COTS training scheme graduate was aged 36.
- HILDA respondents were only included if data were available for the latest year of the HILDA survey plus at least one other year from the period from 2010 onwards, as the COTS training scheme has operated from 2010 onwards. If more than one earlier year were available, the period utilized was the earliest period (from 2010 onwards) for which information on both life satisfaction and employment status was available.
- HILDA respondents were only included if data were available on their satisfaction with life and/or employment status.



Figure 14: Map of ABS regions from which HILDA survey respondents were selected

Descriptive statistics for the two data sets being compared within this analysis – the graduates of the COTS training scheme and our alternate HILDA data set providing an estimate of the counterfactual outcomes, are set out in Table 3 (below).

Of our sample of COTS trainees, 23% identified as Aboriginal and/or Torres Strait Islander. Whilst this proportion exceeds that of the general population and of the respondents to the HILDA survey, this is lower than we expected, based on our understanding from discussions with the training providers that around 50% of the trainees were Indigenous. We were therefore unable to verify the actual proportion of Indigenous program graduates. Similarly, 43% of our sample of COTS trainees were female, but we are unable to verify whether this is a fair representation of the gender mix for COTS training scheme graduates as a whole. Should our sample mis-represent the proportion of Indigenous trainees or female trainees compared to the population, then this discrepancy may introduce a bias in our results. However, by treating for gender and Indigenous status within our analysis we were able to consider the impact that these factors have on the impact of the training program, and these issues are discussed further in the results below.

Table 3: Descriptive statistics for COTS training scheme graduates and for HILDA respondents (Standard deviations are shown in brackets below means)

Attribute	N COTS Trainees ---- HILDA	COTS Trainees Pre- training	HILDA Pre- training	COTS Trainees Post- training	HILDA Post- training
Satisfaction with life (scale 1 – 10)	42				
Mean	----	5.881	7.986	8.571	8.029
(Standard deviation)	209	(2.144)	(1.346)	(1.291)	(1.293)
Employment status (scale 1 – 3)	42				
Mean	----	1.667	2.317	2.286	2.550
(Standard deviation)	186/171#	(0.526)	(0.793)	(0.742)	(0.634)
Fully employed (1 = fully employed, 0 = unemployed or part-time employed)	42				
Mean	----	0.024	0.522	0.452	0.626
(Standard deviation)	186/171#	(0.154)	(0.501)	(0.504)	(0.485)
Age in years now	41				
Mean	----	22.220	26.986	22.220	26.986
(Standard deviation)	209	(4.373)	(5.685)	(4.373)	(5.685)
Gender (1 = female, 0 = male)	40				
Mean	----	0.425	0.522	0.425	0.522
(Standard deviation)	209	(0.501)	(0.501)	(0.501)	(0.501)
Indigenous status (1 = Aboriginal and/or TSI, 0 = non-Indigenous)	40				
Mean	----	0.225	0.104	0.225	0.104
(Standard deviation)	201	(0.423)	(0.307)	(0.423)	(0.307)
Level schooling completed (1 = year 12, 0 = year 10)	40				
Mean	----	0.900	0.606	0.900	0.709
(Standard deviation)	203	(0.304)	(0.490)	(0.304)	(0.455)

less respondents provided this data for the post training time period, n for pre-training is shown first followed by the n for the post-training period.

4.5 Estimating the impact of the COTS training program on satisfaction with life

Our analysis finds that the training scheme had a substantial and significant positive impact on the self-reported life satisfaction of the scheme graduates. The COTS training scheme graduates reported that their satisfaction with their lives, overall, in the 12 months prior to the training program (on a scale where 1=very unsatisfied and 10=very satisfied) was 5.88 on average, compared to an average score of 8.57 for their present satisfaction with life overall. This is a large increase, of 2.69 on average. HILDA survey respondents also reported an increase in their satisfaction with life, but the change was very small, moving from an average score of 7.99 for earlier periods compared to 8.03 for the latest time period available.

Using the *difference in difference* method with no further control variables, we estimate that the mean impact of participating in the training scheme was an increase of 2.65 points on the life satisfaction scale, with 95% confidence that the impact of the training scheme on life

satisfaction lies within the range of 1.85 to 3.44 points. Full results of this basic regression are shown below in Table 4.

Refining the *difference in difference* method to include control variables within the model allows us to control for some socio-demographic differences between the results for those who participated in the scheme and the counterfactual provided by the HILDA data. The results from this model were similar to the simple model, but were found to better explain the change in life satisfactions scores as measured by the Adjusted R^2 statistic⁷ and the Akaike information criteria (AIC)⁸. Further models including a subset (rather than all) of the socio-demographic variables were also tested, but the full model presented below was found to have better explanatory power based on AIC and thus the subset results are not presented here. The value of the Adjusted R^2 statistic value at 0.1945 is reasonable for a model explaining life satisfaction, as such models frequently report values in the range of 0.15 to 0.25 (e.g. Ambrey & Fleming (2014) reported 0.1558, whilst Kubiszewski, Jarvis, & Zakariyya (2019) reported 0.161).

Based on this extended model we find that participation in the training scheme had improved the reported life satisfaction of the COTS training scheme graduates by 2.55 points on the life satisfaction scale on average. Full results of this regression are shown below in Table 4. Further analysis of this regression model revealed that we can estimate with 95% confidence that the impact of the training scheme on life satisfaction lies within the range of 1.73 to 3.36 points.

The results reveal that the variables relating to age, gender, Indigenous status and years of school completed have no effect on the life satisfaction of the COTS trainees, as these variables were all found not to be significant. However, being fully employed was found to have a significant positive impact on life satisfaction, increasing the life satisfaction score by 0.41 over and above the positive impact of the COTS training scheme.

⁷ The higher Adjusted R^2 statistic indicates the model with the better fit. The R^2 statistic explains how much of the variation in the dependent variable is explained by the independent variables included in the model, with the adjusted R^2 statistic adjusting this value to reflect the number of variables in the model, penalizing models which include numerous variables that do not significantly explain variations in the dependent variable.

⁸ The lower AIC score indicates the model with the better fit to the data.

Table 4: Life satisfaction OLS DiD regression results (Robust standard errors are shown in brackets below coefficients)

	Model 1 No control variables	Model 2 With control variables
Depended variable: Satisfaction with life		
Difference in difference variables		
Time dummy	0.0431 (0.1293)	0.0120 (0.1434)
Treatment dummy	-2.1047*** (0.3411)	-1.9703*** (0.3449)
Interactive dummy – indicates impact of participation	2.6474*** (0.4042)	2.5471*** (0.4151)
Control variables		
Age years now		-1.0184 (0.0127)
Gender		0.1491 (0.1397)
Indigenous status		0.0759 (0.2728)
Level schooling completed		0.0759 (0.1571)
Fully employed		0.4131*** (0.1516)
Constant	7.9856*** (0.0933)	8.1183*** (0.3456)
n	502	413
F value	F(3, 498) = 16.72***	F(8, 404) = 7.73***
Adj R ²	0.1606	0.1945
AIC	1769.183	1437.295

*** Significant at 0.01 ** Significant at 0.05 * Significant at 0.1

4.6 Estimating the impact of the COTS training program on employment status

Our analysis finds that the training scheme had a substantial and significant positive impact on the employment status of the scheme graduates, assisting previously unemployed people to move to part-time or full-time employment, and people previously employed part-time to move to full-time employment.

The COTS training scheme graduates reported, prior to the training program, an average score for employment status of 1.67 (on a scale where 1=unemployed, 2=part time employed and 3=full time employed), compared to an average score of 2.29 for their present employment status (i.e. an increase of 0.62 on average). HILDA survey respondents reported an increase in their employment status measured in the same manner, moving from an average score of 2.32 for earlier periods compared to 2.55 for the latest time period available (i.e. an increase of 0.23 on average). Using the *difference in difference* method with no further control variables, we estimate that the mean impact of participating in the training scheme was an increase of 0.39 points on the employment status scale, with 95% confidence that the impact of the training scheme on employment status lies within the range of 0.07 to 0.70 points. Full results of the basic regression are shown below in Table 5.

As with the life satisfaction analysis, refining the difference in difference method to include control variables within the model allows us to control for some socio-demographic differences between the results for those who participated in the scheme and the counterfactual provided by the HILDA data. The results from this model were similar to the simple model, but were found to better explain the change in employment status as measured by the Adjusted R^2 statistic and the Akaike information criteria (AIC). Based on this extended model we find that participation in the training scheme improved the reported employment status of the COTS training scheme graduates by 0.38 points on the employment status scale on average (and further analysis of the model revealed we can estimate with 95% confidence that the impact of the training scheme on employment status lies within the range of 0.05 to 3.36 points).

The results of this regression model reveal that beyond participation in the COTS training scheme, the socio-demographic variables relating to age, gender, Indigenous status and years of schooling completed also have an effect on employment status, as the coefficients for each of these variables were found to be significantly different to zero. Employment status was found to be positively influenced by increasing age and by additional years of schooling. The dummy variables for gender and Indigenous status both have a negative coefficient, indicating that females have a lower employment status than males, and those who identify as Aboriginal and/or as Torres Strait Islanders have a lower employment status than those who do not identify as Indigenous. The full regression results are shown below in Table 5.

Table 5: Employment status DiD OLS regression results (Robust standard errors are shown in brackets below coefficients)

	Model 1 No control variables	Model 2 With control variables
Depended variable: Employment status		
Difference in difference variables		
Time dummy	0.2325*** (0.0758)	0.2104*** (0.0690)
Treatment dummy	-0.6505*** (0.0994)	-0.6043*** (0.1153)
Interactive dummy – indicates impact of participation	0.3865** (0.1586)	0.3793** (0.1693)
Control variables		
Age years now		0.03200*** (0.0061)
Gender		-0.2369*** (0.0622)
Indigenous status		-0.3295*** (0.1086)
Level schooling completed		0.3525*** (0.0772)
Constant	2.3172*** (0.0582)	1.3783*** (0.1807)
n	441	413
F value	F(3, 437) = 29.42***	F(7, 405) = 30.07***
Adj R ²	0.1031	0.2637
AIC	949.842	808.219

*** Significant at 0.01 ** Significant at 0.05 * Significant at 0.1

4.7 Estimating the impact of the COTS training program on the likelihood of being fully employed

Our analysis found that the training scheme had a substantial and significant positive impact on the likelihood of training program graduates being fully employed, compared to being unemployed or employed part time.

The COTS training scheme graduates reported that prior to the training program on average 2.5% were fully employed (the balance being unemployed or employed part time). This compares to 45.2% reporting being fully employed at present. HILDA survey respondents also reported an increase in the percentage that were fully employed, moving from 52.2% for earlier periods compared to 62.6% for the latest time period available.

As the dependent variable of interest for this analysis is a dichotomous variable (only two possible outcomes – either fully employed or not fully employed) the OLS regression-based *difference in difference* method adopted previously was not applicable. Instead, a regression method designed for use with such a dichotomous variable was required. Consequently, the analysis was performed using a logistic regression. Using the *difference in difference* method with logistic regression and no further control variables, we estimate that participation in the training scheme significantly improved the odds of the trainee being fully employed at present, such that training participants were 22.1 times more likely to be fully employed than if they had not participated. Full results of this regression are shown below in Table 6.

As with the previous analysis presented above, refining the *difference in difference* method to include control variables within the model allowed us to control for some socio-demographic differences between the results for those who participated in the scheme and the counterfactual provided by the HILDA data. The results from this model were similar to the simpler model, but were found to better explain the change in likelihood of being fully employed as demonstrated by the Wald χ^2 statistic, the pseudo R^2 statistic and the Akaike information criteria (AIC). Based on this extended model we find that participation in the training scheme increased the likelihood of the COTS training scheme graduates becoming fully employed by 26.5 times.

The results of this regression model reveal that beyond participation in the COTS training scheme, the socio-demographic variables relating to age, gender, Indigenous status and years of schooling completed also have an effect on the likelihood of being fully employed, as the odds ratios for each of these variables were found to be significant. The odds of being fully employed was found to be 1.15 times higher for each additional year of age, and the odds were 2.99 times higher for each additional year of schooling. The variables for gender and Indigenous status both have odds ratios of less than 1, and indicate that the odds of females being fully employed were 0.30 times that of males, and that the odds of those who identify as Indigenous being fully employed were 0.30 times that of those who do not identify as Indigenous. The full regression results are shown below in Table 6.

Table 6: Likelihood of being fully employed DID binominal logistic regression results (Robust standard errors are shown in brackets below odds ratios)

	Model 1 No control variables	Model 2 With control variables
Dependent variable: Fully employed		
Difference in difference variables		
Time dummy	1.5340** (0.3312)	1.6221* (0.4088)
Treatment dummy	0.0224*** (0.0229)	0.0214*** (0.0241)
Interactive dummy – indicates impact of participation	22.0794*** (23.8792)	26.4856*** (32.8693)
Control variables		
Age years now		1.1510*** (0.0297)
Gender		0.2826*** (0.0697)
Indigenous status		0.3048** (0.1444)
Level schooling completed		2.9852*** (0.7628)
Constant	1.0899 (0.1602)	0.0253*** (0.0184)
n	441	413
Wald Chi ²	21.04***	76.51***
Pseudo R ²	0.0987	0.2647
AIC	558.927	436.912

*** Significant at 0.01 ** Significant at 0.05 * Significant at 0.1

4.8 Summary of statistical evaluation of project impact

Overall, our analysis indicates that the AMPTO Blue Army training program has had a large and statistically significant positive impact on both the life satisfaction and the employment prospects of the trainees. The training program was found to increase satisfaction with life scores by 2.55 points (on a scale of 1 to 10 where 10 is very satisfied) and graduates of the scheme were found to be 26.5 times more likely to be fully employed at present compared to if they had not participated in the training scheme.

5.0 DISCUSSION AND CONCLUSIONS

In this report we have presented the results of a study of the social and economic outcomes associated with the COTS Control Youth Training Program, administered by AMPTO and Gempearl Pty Ltd (the AMPTO 'Blue Army Project'), with funding provided by the Queensland Government's Skilling Queenslanders for Work initiative. First, we analysed the survey responses provided by 42 graduates of the training program, then we used a *difference in difference* analysis to compare the outcomes experienced by graduates of the scheme to the expected outcomes should they not have participated in the training. The results of our analyses indicate that the training program improves the lives of the participants, both in terms of improving their overall wellbeing and quality of life, and also in more strictly economic terms of improving their employment (and hence income generating) prospects.

Prior to training, respondents reported a life satisfaction score of 5.9 on average (on a 10 point scale; 1= very unsatisfied with life, 10=very satisfied), increasing to a score of 8.6 at the time of the survey (cf. Figure 10). Furthermore, our *difference in difference* analysis estimates that 2.55 points of that increase can be attributed to participation in the COTS training program. Whilst 5.9 is above the mid-point of the scale, this is lower than the mean score generally expected from such surveys, using benchmarks within Australia and internationally. For example, recent research focusing on Australia as a whole (using the HILDA dataset) reported a mean life satisfaction for all Australians of 7.95, and a score of 8.05 for Indigenous Australians (Kubiszewski et al., 2018). Based on Gallup World Poll⁹ data for the period 2016-2018, the average 'happiness' score for Australia was 7.228, ranking Australia 11th of 156 countries, where the highest-ranking country was Finland with a mean score of 7.769 (Helliwell, Layard & Sachs, 2019). The pre-training mean score of 5.9 is comparable to such diverse countries as South Korea (5.895), Estonia (5.893) and Jamaica (5.890) in this same report (Helliwell et al. 2019). Thus our results suggest that participation in the COTS training scheme had moved the self-reported life satisfaction score from a level substantially below the average for Australia to a level that exceeds this average, which should be acknowledged as a significant achievement for the program¹⁰. The results also show that becoming fully employed significantly enhances self-reported life satisfaction, which is consistent with expectations based upon the life satisfaction literature (e.g. Winkelmann & Winkelmann, 1998).

International research has considered the possible implications of low life satisfaction, beyond the unhappiness of those reporting the low scores. Research focusing on the Nordic countries developed a useful categorisation for such life satisfaction scores, describing those who report a score of 7 to 10 as 'thriving', whilst those reporting from 5 to <7 were 'struggling' and those reporting a life satisfaction score of below 5 were 'suffering' (Andreasson, 2018). Viewing the COTS training scheme graduates through this lens recognises that prior to their participation in the scheme the young people were on average *struggling* (and 29% were *suffering*), whilst post-training the graduates were, on average, *thriving* (and 2% were *suffering*). As Andreasson (2018) observes, whilst it can be difficult to prove causality between low life satisfaction and other factors, there is significant evidence of correlations between factors – for example, those reporting higher life satisfaction scores live longer (Steptoe & Wardle,

⁹ The Gallup World Poll utilizes an 11-point scale of 0 to 10, and thus is similar but not directly comparable to the scale used for the COTS training scheme graduates.

¹⁰ Although it is important to bear in mind the small sample size resulting from our survey of COTS training scheme graduates (n=42).

2011). Those people within the *struggling* and *suffering* categories are more likely to report poor general health, and poor mental health, compared to those in the *thriving* category (Andreasson, 2018). Thus assisting the young people to move to the *thriving* category may produce longer-term general and mental health benefits in addition to increasing their immediate overall satisfaction with their lives.

Second, we focus on the employment benefits reported by our survey respondents. Comparing the employment status of COTS training program graduates prior to the training program and today we see that there has been a 19% reduction in the proportion of unemployed and 24% reduction in the proportion of part-time employment, and a very large increase of 43% in the proportion in full-time employment (cf. Figure 11). Furthermore, our *difference in difference* analysis estimates that COTS training program graduates are 26.5 times more likely to be in full time employment than if they had not participated in the training program. These findings suggest that participation in the training program improves the actual employment outcomes of the program participants. This is further supported by the increased confidence that future employment prospects were good as reported by the graduates (cf. Figure 4).

The results also show that the socio-demographic variables included in the analysis also significantly impact on employment outcomes. Employment status and the likelihood of being fully employed are enhanced by increased age and an increased level of formal schooling. Employment status is reduced by being female (as opposed to male) and the odds of a female being fully employed are less than the odds for a male. Employment status is also reduced by identifying as Indigenous (as opposed to non-Indigenous) and the odds of an Indigenous person being fully employed are less than the odds for a non-Indigenous person.

Finally, the qualitative data provided by our survey respondents (i.e. text responses to open-ended questions; shown in Section 3) are strongly in alignment with the results of our quantitative analyses. The statistical improvement to ratings of life satisfaction being attributed at least in part to the training program is supported by comments from graduates describing improvements across many domains of their lives, perhaps best encapsulated in the statement of one graduate *“I’m motivated, I’ve met a number of life-long friends, I’ve found a passion in reef conservation, and I absolutely love the lifestyle of working in tourism”* (cf. Section 3.5).

With regards to employment outcomes, our statistically significant results showing the impact of the program are exemplified by comments from training graduates relating to their personal journeys before, during and after the program; perhaps best summed up by comments such as: *‘Everything about my future and career are because I did the COTS program. It honestly saves my life and I have a lot to thank for it’*, by one graduate, and: *“I am in a career that I love and never would’ve gotten into it without the program”* from another (see Section 3.5).

Research has identified that a key principle adopted by successful programs seeking to address youth unemployment is to focus on the capabilities and experiences a young person needs to develop to gain and retain meaningful employment. Such capabilities relate to *personal identity, aspirations, literacy and numeracy, employability skills and career management* (Social Ventures Australia, (2016). The benefits reported by graduates of the COTS training program provides evidence that the training program addresses each of the

dimensions of this key principle, which is likely to contribute to the successful outcomes found by our study.

Overall, our mixed methods study both quantifies and qualitatively describes several beneficial social and economic outcomes among the youth training program graduates, that can be attributed directly to the training program.

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APPENDIX 1: PARTICIPANT INFORMATION SHEET



Research Participant Information Sheet

Graduate outcomes from the COTS Control Training Program (February 2020)

Project overview

You are invited to take part in a research study about individual and community outcomes arising from the Crown of Thorns Starfish (COTS) control training program, operated by the Association of Marine Park Tourism Operators (AMPTO) and funded by the Queensland Government Department of Employment, Small Business and Training. The study is being led by Matt Curnock (CSIRO Land and Water), and Diane Jarvis (CSIRO and James Cook University), and the study is being jointly funded by the Australian Government's National Environmental Science Program, CSIRO and James Cook University.

The purpose of this project is to understand the social and economic outcomes from the COTS Control trainee program, and any benefits that the program has provided for individual trainees and for local communities. Findings from the study will help policy makers in their future decisions related to such training.

What does participation involve?

Participation in this study will involve completing a short online questionnaire that will take approximately 15 minutes. The survey will cover the following topics:

1. How the training program has contributed to individuals' career development and future outlook
2. Potential flow-on economic and social benefits that may have resulted from training program
3. Benefits to stewardship of the Great Barrier Reef

We will gather some demographic information about the people who participate in the study (e.g. gender, occupation, education, and cultural background). This information will be kept in confidence and all participants will remain anonymous.

\$50 for 15 minutes of your time

As an incentive to participate, we are offering a [\\$50 prepaid Mastercard Gift Card](#) to all program graduates who complete the survey*. Instructions to claim the gift card are provided at the end of the survey. To start the survey, see the instructions overleaf.

*Only graduates of the AMPTO COTS control training program are eligible to participate and receive a gift card. It doesn't matter which year you graduated.

Risk and benefits

Aside from giving up some of your time, there are no foreseeable risks associated with participating in this study. If at any stage you feel uncomfortable and wish to skip a question or withdraw from the study, you are free to do so. If you have any concerns, you can contact the researchers or the CSIRO Human Ethics representative (details overleaf).

(Continued over page)

Survey instructions:

1. In your free time, using your smartphone or another device connected to the internet, scan the QR code to take you to the start of the survey:
2. Alternatively, open a browser window (e.g. Google Chrome) and type in the following web link: <https://www.surveymonkey.com/r/2SWVRVK>
3. After completing the survey, instructions on how to claim your \$50 prepaid gift card are shown on the final page of the online survey.



Note: this survey will close once the target number of responses are received. Get in quick!

Confidentiality

All information provided by you will be treated confidentially. Your name, workplace or any other personal information will not be included in any publications, reports or presentations resulting from the study. All data collected in this study will be coded in a de-identified manner and subsequently analysed and reported in such a way that responses will not be able to be linked to any individuals. De-identified, non-sensitive data collected by the project may be shared with other researchers for the purposes of verifying published results or advancing other research on this topic. Any data collected as part of this study will be securely stored as per CSIRO's Recordkeeping Procedure.

How will my information be used?

It is anticipated that the survey data will be published and/or presented in a variety of forums. This includes the production of a general report on benefits associated with the training program as well as scientific journal publications and conference presentations. These data may also be used in future research being undertaken by CSIRO on the benefits of such training programs. You will not be identified in any way in any of these publications and presentations.

Ethical clearance and contacts

This study has been approved by CSIRO's Social Science Human Research Ethics Committee in accordance with the *National Statement on Ethical Conduct in Human Research (2007)*. If you have any questions concerning your participation in the study please contact the researchers via their contact details below. Alternatively any concerns or complaints about the conduct of this study can be raised with the Manager of Social Responsibility and Ethics on (07) 3833 5693 or by email at csshrec@csiro.au.

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Thank you for taking the time to help with this research project. Please keep this sheet for your information.

APPENDIX 2: SURVEY QUESTIONS

Note: this survey was delivered online using the SurveyMonkey™ platform. The formatting shown below differs in appearance from the online version; however, the question order and wording are the same.

Title page and preamble

COTS control training – SURVEY FOR GRADUATES (2020)

Please tell us how the training has benefited your life and career so far.

This study is being led by CSIRO researchers, in collaboration with the Reef and Rainforest Research Centre (RRRC), on behalf of the Australian Government's National Environmental Science Program (Tropical Water Quality Hub).

This survey contributes to an assessment of the social and economic outcomes of the AMPTO "Blue Army" COTS control training program, and the information you provide will help to inform policy and planning for the funding and delivery of such training into the future.

Please see the accompanying Information Sheet for details about the study aims, confidentiality and ethics, and researcher contact details. Before completing the survey questions below, please ensure that:

- You have been informed about the aims and methods of this study.
- You are aware that your participation is entirely voluntary, and that you can withdraw from the study at any time.
- You are aware that you can skip any questions you don't wish to answer, for any reason.
- You are aware that your responses will be treated confidentially, and you will not be individually identified as a participant.

Completing this online questionnaire will take approximately 15 minutes of your time. Thank you for your support for this study. We wish you all the best in your career!

Survey questions

1. I have read the Participant Information Sheet, am aware of the voluntary and confidential nature of this study, and am happy to proceed with the survey.

(Note - if you do not wish to participate, simply leave this page or close the browser window)

- Agree

2. In what year did you graduate from the training program? _____

Part A: Your background, before the AMPTO training program

3. How satisfied were you with your life, overall, in the 12 months before you began the training program? Please choose one number on the scale below:

1 - - 2 - - 3 - - 4 - - 5 - - 6 - - 7 - - 8 - - 9 - - 10
(1 = very unsatisfied; 10 = very satisfied)

- OPTIONAL: Can you explain briefly why you felt this way? _____

4. How did you first hear about the training program? Please describe briefly: _____

5. What made you decide to apply to the program? Please tick any/all boxes that apply:

- Was encouraged by friends or family
- Have friends or family who had done the training
- Self-motivated, to improve my career prospects in general
- Self-motivated, to help get a specific job ...If so, which job? (please describe in the comment box below)
- Other ...Please explain briefly below:
 - If "other" - describe here please: _____

6. Which category below best describes your employment status, in the 12 months before you started the training program? Please tick the box that best applies to you:

- Unemployed
- In part-time or casual employment
- Other - please describe briefly: _____

7. Please read through the following statements, reflecting on your life in the 12 months before you joined the AMPTO training program, and then rate your level of agreement or disagreement with each statement, by choosing a number of the five-point scale (where 1 = Strongly Disagree, and 5 = Strongly Agree)(GBR = Great Barrier Reef)

"Before joining the training program..." (1 - - 2 - - 3 - - 4 - - 5)

- (i) I was confident that my future employment prospects were good
- (ii) I was highly motivated to work hard to achieve success
- (iii) I was a confident speaker in the company of adults outside my family and friends
- (iv) I cared about the health of the GBR and the natural environment
- (v) I wanted a professional career in the GBR
- (vi) I knew a lot about the GBR, its ecology, and threats
- (vii) I felt a strong personal connection to the GBR (or to my sea country)
- (viii) I had a strong network of people (e.g. family, friends) who supported me through hard times
- (ix) I often felt worried or stressed
- (x) Other people could rely on me for help
- (xi) I could afford to buy things I liked
- (xii) I was proud of my skills and abilities
- (xiii) I was proud of my country, culture and heritage
- (xiv) People in my community saw me as a role model for other young people

Part B: Your current life and work, after the training program

8. How satisfied are you with your life, overall, at the present stage? Please choose one number on the scale below:

1 - - 2 - - 3 - - 4 - - 5 - - 6 - - 7 - - 8 - - 9 - - 10
(1 = very unsatisfied; 10 = very satisfied)

- OPTIONAL: If the score has changed compared to Question 5 (satisfaction before the training program) can you explain briefly why? _____

9. Please select which category best describes your current employment status:

- (i) I am currently employed in the COTS control program
- (ii) I am currently employed by a Reef tourism operator
- (iii) I am not currently employed
- (iv) I am employed elsewhere ...If so, please tell us the industry or sector in which you work; e.g. retail, construction...):
 - Describe other employment here: _____

10. If you are currently employed - how would you describe your current employment?

- (i) Full-time employment
- (ii) Part-time or casual employment
- (iii) Not applicable (I am not currently employed)

11. How many whole days per week (on average) do you work? _____

12. If you are currently employed, for how long have you worked in this job? (years) ____

13. How satisfied are you with the training you received from the COTS control training program, overall? Please choose one number on the scale below:

1 - - 2 - - 3 - - 4 - - 5 - - 6 - - 7 - - 8 - - 9 - - 10
(1 = very unsatisfied; 10 = very satisfied)

14. What was your favourite part of the training program? ...Please describe briefly, with reason(s) why: _____

15. Are there any parts of the training program that weren't so good? ...If so, please describe and explain briefly: _____

16. Please read through the following statements, reflecting on your life today, and then rate your level of agreement or disagreement with each statement, by choosing a number on the five-point scale (where 1 = Strongly Disagree, and 5= Strongly Agree)(GBR = Great Barrier Reef)

"In my life today..." (1 - - 2 - - 3 - - 4 - - 5)

- (i) I am confident that my future employment prospects are good
- (ii) I am highly motivated to work hard to achieve success
- (iii) I am a confident speaker in the company of adults outside my family and friends
- (iv) I care about the health of the GBR and the natural environment
- (v) I want to have a professional career in the GBR
- (vi) I have learned a lot about the GBR, its ecology, and threats
- (vii) I feel a strong personal connection to the GBR (or to my sea country)
- (viii) I have a strong network of people (e.g. family, friends) to support me through hard times
- (ix) I often feel worried or stressed
- (x) Other people can rely on me for help
- (xi) I can afford to buy things I like
- (xii) I am proud of my skills and abilities
- (xiii) I am proud of my country, culture and heritage
- (xiv) People in my community see me as a role model for other young people

17. Considering the statements above, have there been there any significant changes in your life or career plans that you would attribute directly to your participation in the COTS control training program? If so, please describe briefly... _____

18. Would you recommend the COTS control training program to other young people?

- No
- Yes
 - Any comments or particular reasons why? _____

19. What is your age in years? _____

20. Your gender?

- Male
- Female
- Other

21. What level of formal school education have you completed? (Queensland high school equivalent)

- Less than Year 10
- Completed Year 10
- Completed Year 12

22. Your hometown? _____

23. Postcode (if known): _____

24. Do you identify as Aboriginal or Torres Strait Islander? Please tick one or more of the boxes that apply:

- (i) No
- (ii) Yes – Aboriginal
- (iii) Yes - Torres Strait Islander
 - If Yes to above - do you identify with a Traditional Owner group in the GBR region?
 - If yes, which group? _____

END OF SURVEY

Thank you for your feedback!

To receive your \$50 prepaid Visa gift card, please type your name and postal address (e.g. home or work address) in the box below and we will post it to you ASAP.

Please note that your personal details will not be stored in our records, and will not be made accessible to anyone. Once we have sent out your gift card, we will delete this personal information from the database, and you will not be individually identifiable from your survey responses. If you have any concerns please contact Matt Curnock (project leader) via email: matt.curnock@csiro.au or phone: 4753 8607.

We wish you all the best in your career!

