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Lock-in and Learning - North West Coast of Tasmania

Report for Regional Australia Institute

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1 Introduction

The project addresses the seeming intractability of securing sustainable and inclusive transitions in regional workforces in regions where the dominant, traditional industries have gone into decline or closed. For the North West Coast of Tasmania, this includes product mass production (paper, chemicals, machinery, wood processing, food production and processing) and resource extraction (mining and energy). From a theoretical perspective, this intractability can be seen as an example of path dependency and lock-in, defined as:

> …the combination of historical contingency and the emergence of self-reinforcing effects steers a technology, industry, or regional economy along one "path," rather than another (Martin 2010, p. 3)

In focusing on regions, this concept has been broadly discussed in economic geography, political science and historical sociology (Lagerholm & Malmberg 2009). The association between path-dependency, lock-in and industrial specialisation is also evident in Australian regional cities, whereby:

> … the direction of change adopted by a region or city is important as those that choose to specialise in industries with limited prospects may stagnate, while those able to link their economy to a growing industry will receive long-term benefits (Beer & Clower 2009, p. 387).

The writing on lock-in emphasizes the difficulty in changing the trajectory of regional economies once foundational industries enter decline, as indicated by the 'Rust Belt' in the US and the efforts to stimulate the economy in the north of England through projects such as HS2 (Chen & Hall 2013; Glaeser 2011). Geelong, Wollongong and Newcastle, which are Australian examples of cities that grew remarkably during the 20th century as a result of industry specializations, experienced periods of uncertainty but have grown strongly in recent years as a result of their proximity to Sydney and Melbourne and transitioning to regional service hubs in sectors such as retail, health and education. The prosperity of these Australian regional cities, particularly in comparison to their US counterparts, may also be seen as a result of Government commitments to applying structural adjustment packages to areas where lock-in and industrial decline had taken hold, which included labour market programs that incorporated reskilling (Beer 2015).

Martin (2010) laid the foundation to address the prospects for and possibilities of change in seemingly intractable regions faced with social and economic decline. Specifically, Martin argues that it is necessary to take into account the possibility and prospects of change given the resources and capacities within the region. This approach addresses the situation where the very strengths of the past – resources, organisational forms, technological bases, workforce skills and experiences - become barriers or impediments to sustainable and prosperous futures (Hassink 2010). For example, Glaeser (2011) attributes the rise of Detroit in the first half of the twentieth century to a cluster of small firms competing and therefore innovating within the automobile manufacturing sector, and the decline towards the end of the century to the consolidation of these firms into a small number of large companies with limited competition and without the impetus for developing new products and practices.

Following the analysis of path dependency by Martin (2010), it is suggested here that the recombination of institutions that comprise the regional economy and training system may, via incremental change at a micro-level, result in successful economic transitions over time. The proposition here is that learning, with implications for reskilling, upskilling and cross-sector skilling, and the capacities thus enabled, can become an impetus for change by firms and services in a region, and therefore community outcomes and aspirations. This is often accomplished with targeted education and skills development programs that may foster change, even within relatively stable employment and organisational situations (Carlsson 2006; Menzel & Fornahl 2007). It also indicates an intersection with regional innovation systems, that is how innovations and new ways of working are disseminated regions, which is founded in the interaction of institutions and industry within a location {Isaksen, 2018 #502}.

This project focuses on the northern region of North West Tasmania, and explores the factors inhibiting and encouraging local adaptability to these changed circumstances. Industrial lock-in here is a result of regional concentrations of industry, which provided opportunity in the growth and development phase (1930s – 1980s), but subsequently led to concentrated unemployment and out-migration as the central industries entered decline and, in many cases, ceased operating. The role of education and skills development in transitioning the workforce in preparation to work in and support new industries in the region is the central concern of this report.

The research will open up discussion about the ways that some places, towns and regions have been more assertive in improving the performance of local (and locally-based) employers, job-seekers and those in transition, and educational and training providers. The aim is to provide the basis to assess the impact of different approaches to overcoming regional lock-in. This grounds and centre stages regional governance, as suggested by Beer and Clower (2014), and locates analysis in relation to the social specificities of particular regional economies and societies as illustrated by Bowman et al. (2014).

2 Background and Context

2.1 Demography and disadvantage

Although the North West coast contributes 21% of Tasmania's GDP It has low levels of labour force participation, fewer fulltime and lower skilled jobs, high levels of long term unemployed persons, people receiving government income support and jobless families and low levels of educational attainment (Neville 2014). Burnie is located in Tasmania's North West coast. In 2016 the North West coast had a population of 101,027, which represents 19.5% of Tasmania's population (ABS 2016b). Devonport is the largest town on the North West coast with a growing population of over 25,000 people. The next largest town is Burnie with a population of 19,000 people. At one stage Burnie had a population of 22,000 people, but with deindustrialisation its population has declined.

As a result, it is one of the poorest regions in the most disadvantaged State in Australia, as:

- The average household income in Tasmania is 34% less than the average in other States;
- At 31.3%, Tasmania has the highest proportion of its population in the most disadvantaged quintile whilst a further 23.3% are in the second most disadvantaged quintile, a figure surpassed only by South Australia;
- It has the oldest population, poorer health and school retention rates and a lower percentage are employed than in any other State.
- Tasmanians with jobs work on average 1.5 hours less per week than elsewhere and show poor labour productivity, producing on average 18% less per hour than the average for the Australian workforce (ABS 2016b). This is associated with lower rates of employment in mining and financial services in comparison to other states.

These levels of disadvantage, when taken in conjunction with the changes in the labour market, pose significant challenges for the region. Particularly as the North West coast can be seen as experiencing a form of regional lock-in, where the concentrations of industry that provided opportunity in the growth and development phase have led to concentrated unemployment and out-migration as the central industry, in Burnie's case the pulp and paper mill, enters decline or closure (Beer & Clower 2009). In this sense, the relationships and patterns of behavior from the past can hinder a region's ability to regenerate.

2.2 Industrial history

For most of the 20th century Tasmania's economy rested on hydro-industrialisation, agriculture and resource extraction with a highly internationalised economy (Stratford 2008). This had its roots in 1914 when the Tasmanian government established the Hydro Electric Department and subsequently started a programme of dam construction (Tighe 1992) and used the incentive of cheap hydro-electric power to attract industry to a state that seemed to be perpetually in economic crisis (Robson 1991). This encouraged industry to locate on the North West Coast but since the mid-1990s many manufacturing industries have closed or relocated.

Companies that established factories in the North West that have subsequently closed include:

- APPM opened at Burnie in 1938, which closed in 2010, had employed up to 2,500 people.
- Tioxide at Heybridge near Burnie in 1949, which closed in 1996, had employed up to 450 people (Summers 2005).
- The Tascot Templeton Carpet factory in Devonport, established in 1962, closed in 2010 with the loss of 100 jobs and was followed in 2014 by the closure of Australian Weaving Mills, which had opened in 1952, with the loss of 50 jobs. At one stage these two companies had employed 500 people (ABC 2013)
- At Smithton, the McCain vegetable processing plant operations transferred to New Zealand in 2009 with the loss of 270 jobs (Barton & Fairbrother 2014).
- Caterpillar mining retrenched over 480 workers in tranches as it offshored much of its manufacturing from Burnie to Thailand (Kempton 2015).
- In May 2017 Murray-Goulburn milk announced its processing plant near Smithton would close in late 2018 with the loss of 120 jobs (Kempton 2017).

Even with these closures, North West coast retains a strong manufacturing sector, with a concentration in the dairy, vegetable processing industries and advanced metal fabrication. The Table Cape butter factory opened in 1892 and there are now factories associated with dairy product processing at Wynyard, Burnie and Spreyton (Cassidy 2005), while vegetable processing plants owned by the multinationals Simplot and McCain still operate at Quoiba and Ulverstone (Alexander 2005) and the Goliath Portland Cement Company that opened at Railton in 1930 continues to operate. Caterpillar continues to design its mining machinery in Burnie while there are industries such as mineral processing and other food related industries. However, the industrial structure has been seen as a factor in the low productivity in the region. There is an under-representation in the region (and Tasmania as a whole) of those industries that have relatively high levels of labour productivity either because they are capital intensive or rely on highly skilled labour, such as the mining or finance and insurance sectors (Eslake 2017; RAI/Cradle Coast Authority 2018).

2.3 Educational Attainment

The loss of significant numbers of traditional manufacturing jobs, as well as the low rates of secondary school completion and tertiary education pose a significant challenge for the region as it attempts to refocus on a changed future. As can be seen in the figure below, the North West coast has low level of higher educational attainment based on the data for the Devonport SA3 for those aged 15 and over. It also indicates that these low levels of tertiary education are preceded by low year 12 completion rates relative to both Tasmania and Australia (see also Perkins & Brindley 2014).

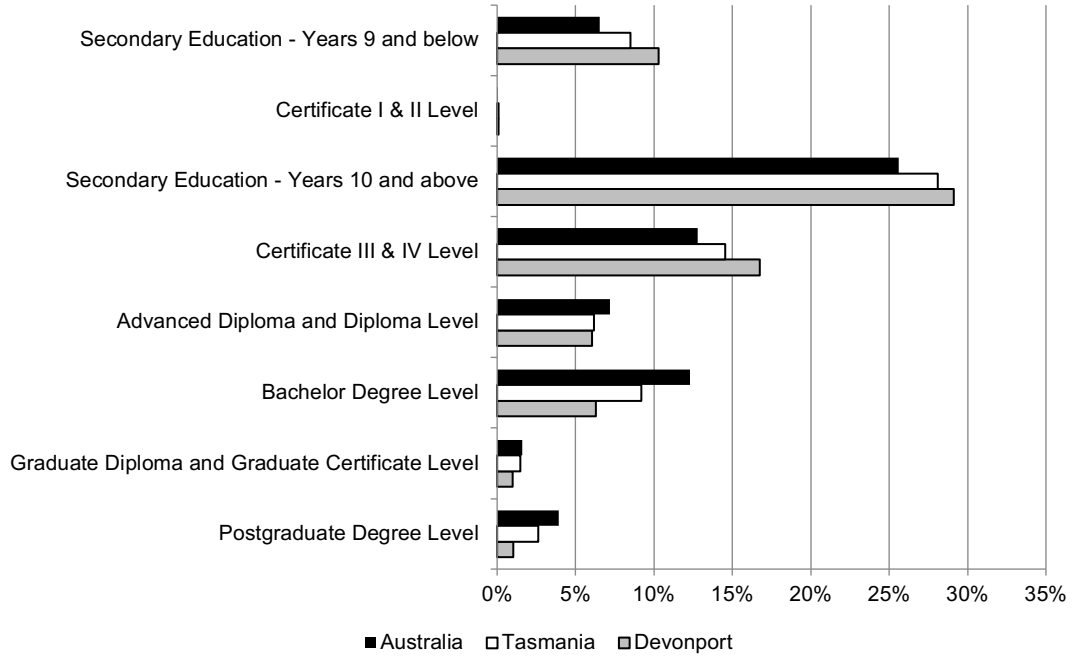


Figure 1: Highest level of educational attainment, Davenport SA3 2015

Source: ABS 2016: Place of Usual Residence, Highest level of Educational Attainment (HEAP) Level 1.

These low levels of educational attainment are related to the high levels of disadvantage in the region, based on the data for the entire regional population. In 2016, here were 2,818 families where there was not an adult working in the North and Northwest Tasmania SA4, more than 6,000 children in household without a parent in the labour force, and only 52% of single parents were in the labour force (ABS 2016b).

In spite of some of the State's highest levels of disadvantage and lowest levels of educational attainment, North West coast schools perform as well or better in reading and numeracy than comparable schools across Australia. This may reflect a tendency for those with higher levels of educational attainment within the region to move away to access different, or better, employment opportunities. This has led Sutton et al. (2017, p. 180) to suggest that this represents a "complex portrait of a community that, in some respects, performs exceptionally well educationally given the challenging economic conditions in the region". This would appear to indicate that at least some aspects of the interaction between the community and educational system are meshing.

Nevertheless, as the figure below reveals, there is a relationship between educational attainment level and labour market outcomes: unemployment falls and participation increases with educational attainment.

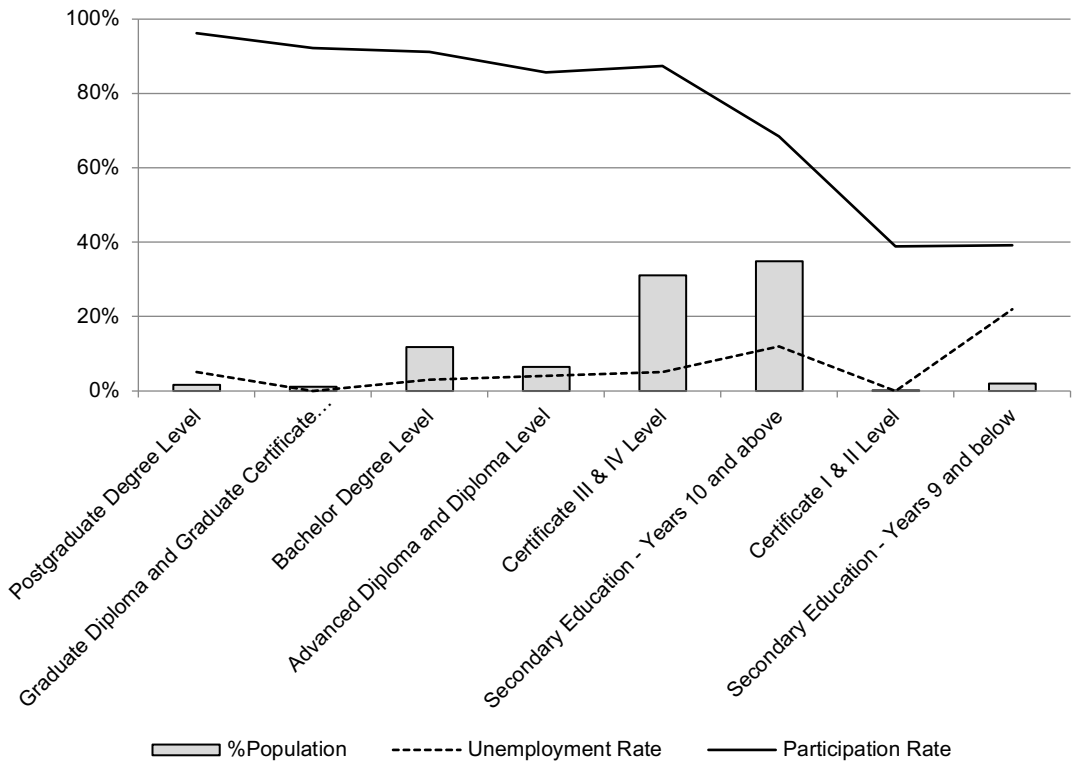


Figure 2: Educational Attainment and Labour Market Outcomes

Source: ABS (2016): HEAP, North and North West Tasmania SA4, people aged 25-34

Improved school completion rates are important because they contribute to increased social cohesion and prosperity, economic competitiveness, employability, health and wellbeing (Sutton et al. 2017). There does appear to be evidence that school retention and completion rates on the North West coast are improving and are superior to the rest of Tasmania, with 83% of year 10s in the 2014 cohort went on to finish year 11 in 2015 and 75% of those completed year 12 in 2016. However, how this translates into VET and higher education participation is a subject for future investigations (RAI/Cradle Coast Authority 2018).

The research on school completion rates in regional Tasmania indicates a confluence of reasons behind poor completion rates. There are socio-cultural reasons, such as the impact of poverty and unemployment on family priorities which affects educational aspirations, education is afforded a low priority, some families view education beyond year 10 as being of little value and that staying on beyond year 10 is seen as the exception rather than the norm, but changing employment opportunities and some level of deindustrialisation means that education is valued more highly than in the past. There are structural reasons as well, such as the isolation of some students from colleges and schools, and mixed transitions from high school to college. In this regard, Department of Education initiatives designed to enhance student and family commitment to education are a positive intervention. There is increasingly a realisation that education retention in Tasmania is a whole of community issue that requires community leaders and stakeholders working together to develop responses (Cranston et al. 2014; Sutton et al. 2017)

While there is indication of a re-evaluation of education on the North West coast, there are still young people who have been locked-in to outmoded ways of thinking, focused on

traditional career paths that are unsuited to a knowledge economy and set at an early age. These perceptions are framed by the person's family and occur in an environment where matriculation colleges were seen as attended by "academically motivated students" and higher education was not part of that family experience (Corbett et al. 2017, p. 11). In this, education is presented as unusual and is thus a challenge to students from low SES and primary or secondary industry families. There have been community interventions aimed at improving educational attainment for young people, which were focused on the family as the "aspirational unit" but that these tended to be concentrated in the early learning years and diminished as the student progressed through high school (Sutton et al. 2017).

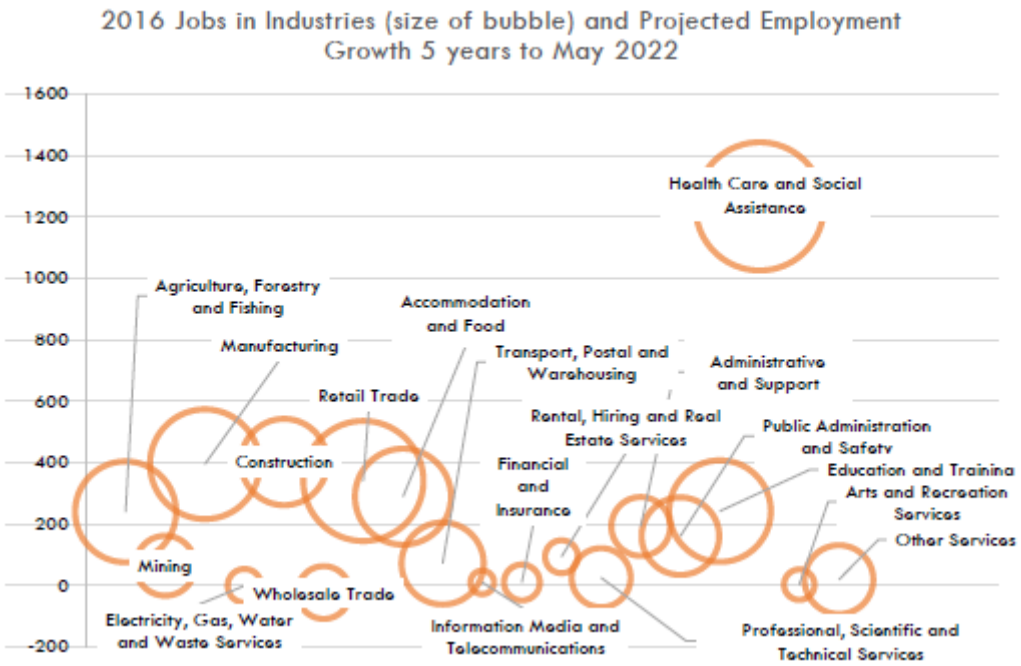
These students have aspirations, but they are framed by their family and social norms. This is often centred on a belief that post year 10 education was unnecessary for an industrial job. This may have been a viable career path in the past, but with these jobs disappearing there is a need for young people to see the opportunities presented by participating in higher education (Corbett et al, 2017). This interplay of locational, economic and cultural factors and their influence on low levels of educational retention and attainment are not confined to Tasmania, but are reflected in other rural locations in Australia, as well as internationally (Sutton et al, 2017). In contrast to these overarching trends, Local Government programs in Burnie indicate that education is valued as a pathway to employment within sections of the North West community (Social Ventures Australia 2016)

3 Future Skills and Capability Needs

The region's development agency, the Cradle Coast Authority (CCA), has prioritised improving the educational attainment of the local workforce to ensure they have the skills to fill local jobs. The CCA has worked with the RAI on a Pathfinder project and that has identified gaps in knowledge of skills and industry workforces, coordination and integration across employment, and education pathways in the region (RAI/Cradle Coast Authority 2018). As can be seen from the table below, this project includes projections on the growth levels in different industry sectors on the North West coast.

Currently, the sectors that employ the most people in the region are Health Care and Social Assistance, Education and Training, Retail and Manufacturing. There appears to be new opportunities emerging in some 'old' industries, namely advanced manufacturing, agribusiness, aquaculture, forestry and renewable energy. A number of these sectors require a highly skilled workforce with higher educational levels. Given the educational profile of the North West coast workforce, many of these positions may not be filled because of a lack of suitably qualified applicants in the region (Perkins & Brindley 2014; RAI/Cradle Coast Authority 2018). As we have seen previously, the North West coast suffers particularly from a deficit of people with tertiary education and higher skills levels, which poses a particular challenge for the region and makes the interaction between secondary, VET and higher education particularly important.

Table 1: 2016 Jobs in Industries and Projected Employment Growth



Source: RAI/Cradle Coast Authority, 2018.

4 Employment and employment projections

If the North West coast is to address its skill shortage issues then it needs to raise the region's levels of educational attainment. This can be achieved at least in part by making it easier for people to have multiple pathways into education beyond year 10. There are many young people of working age who are insufficiently engaged with work or able to secure an entry point into the workforce. If the issues of low labour market participation and employability are to be addressed, the solution lies in information and idea sharing between all levels of government, industry and the community (Perkins & Brindley 2014). It is of note that State and Local Government have made attempts to foster greater integration between all education sectors.

One aspect of this has been to introduce Year 11 and 12 classes in regional secondary schools. This was a response by the Tasmanian Liberal Party to concerns about school retention rates and fears the matriculation/community colleges were not fulfilling their role and were contributing to students leaving school after year 10. This was a move away from the community colleges that had been developed in the 1960s in response to Tasmania's dispersed population and cost pressures (Rodwell 2017; Sutton et al. 2017). In Burnie, the region's senior secondary school Hellyer College has partnered with local extension schools to cater for the local area's Year 11 and 12 needs. This has seen the College and local extension schools coordinate their "course and program offerings by maximising the teaching expertise and facilities available to support students within the community" (Hellyer College, 2018: 3). This means that depending on their course, students may travel between the College and the relevant local extension school to complete their courses. The aim is to provide an adult learning environment where young people transition between their younger school days and the world of work, employment and training. The College supports students from disadvantaged households that have generational unemployment and family conflict by providing a wide range of support services, including a nurse, youth worker, doctor, psychologist, and police officer. Students are also able to complete Vocational Education and Training (VET) programs at the co-located Burnie TasTAFE campus.

The University of Tasmania has engaged with the community in an attempt to reverse Tasmania's low levels of tertiary education participation rates by offering Associate Degrees through the new University College. The College oversees pre-bachelor initiatives such as the University Preparation program and Diploma of University Studies, which offer alternative pathways into University. These courses are strongly supported by industry and attractive in that they are shorter, meaning people are out of the workforce for less time, more affordable for less wealthy Tasmanians and are clearly linked to vocational outcomes. Over 70% of the College's students are from a cohort that would not have chosen university, and many are the first in their family to attend tertiary education. Associate Degrees in Applied Business, Agribusiness, Allied Design, Applied Science and Applied Technologies are offered and after two years, students can then articulate into the third year of a degree (ABC 2017; Rodman 2018; University of Tasmania 2018). These courses appear to be strongly linked to the region's future skill and capability needs.

The introduction of these Associate Degrees has brought into focus some of the University of Tasmania's Cradle Coast campus' limitations. While the campus is located only a short

distance from Hellyer College, it has limited capacity, is out of sight and poorly integrated into the community. When coupled with the limited course offerings, this saw student numbers fall by 13% between 2010 and 2014. The campus is at full capacity three days a week and is cross subsidised by $6 million a year, which has resulted in the University being unable to maintain its current operations and support the introduction of a full range of the new Associate Degrees. As a remedy, it is planned to relocate the campus to West Park, closer to the town centre, which will result in 3,000 staff and students in Burnie. This would include an increase in 2,000 students studying at Associate Degree and Degree level and involve further investment in the Tasmanian Institute of Agriculture, entrepreneurs and start-ups supported by an innovation centre/incubator space and closer integration with TasTAFE to support articulation and participation in higher education (University of Tasmania 2016).

The linkages between TasTAFE and the University were strengthened in 2018 when they both signed an agreement to deliver better educational outcomes by providing one entry point in rural and regional Tasmania. The aim was to make it easier for students to move between TasTAFE and the University and was touted as helping the community and society by producing graduates with the “right balance of knowledge, skills and innovation”. These are aimed at rural and regional areas and have an industry focus. Priorities for the next 12 months are:

- Clearer pathways between the two organisations so students can tailor knowledge and skills-based qualifications in ways better suited to both their and the State’s needs.
- Shared strategies for the delivery of provision education in regional and rural areas that provide one ‘front-door’ for post-school education to increase access to education.
- Developing complementary courses, working with industry to determine present and future workforce needs.
- Thinking innovatively about embedding vocational education skill sets in higher education qualifications (or short courses) to meet the current and future skills needs of industry.
- Exploring co-location opportunities at both organisations as the University progresses campus developments and future TasTAFE Centres of Excellence are developed (TasTAFE, 2018).

Overall, the relationships between secondary education, VET and higher education sectors have improved in recent years, and appear to be fluid and flexible in catering to the region’s needs. However, as these are recent developments, how successful they are in providing a pathway for locals to employment opportunities is still to be determined.

5 Employer training providers and job seeker relationships

The relationship between employers, education providers and job seekers is contradictory. There appears to be many people wanting work, but a shortage of local people with the relevant skills to fill employment opportunities in the region. One advanced manufacturing/processing company was aware that the spate of industry closures provided an available workforce, but the company had great difficulty finding local people with the right skill set. As local educational providers were unable to provide appropriate training, people were employed from outside the region. As one interviewee noted:

> *I think North West Tasmania has one of the lowest standards of education in Australia … so we've done a lot of training … we've been able to get a few people, but they're mainly from outside the area, in key roles. Then we've had to employ people and training them up. I think that's a key problem with this area - the education standard.*

The interviewee lamented that the disconnect between the lack of specialised technical engineering and laboratory training on the North West coast created the situation where young people left to be trained but then did not return to the coast. The company employed some trade-based people, but mostly employed year 10 or 12 school leavers and then provided their own training. The company saw itself in the value-added manufacturing area but believed that the poor educational level of the region's workforce and its training providers did not support its development (Advanced Manufacturing, 2014).

The gap between the educational levels on the North West coast and the skill demands of employers can play out in contradictory ways. In the agribusiness sector, 20.5% of those in the Cradle Coast thought that creating jobs was a very important long-term goal, as did 16.4% of those in the North, but only 2% nominated it was as their most important long-term goal at the moment. Only 2.4% nominated training or skills development as the aspect of the business they had invested the most money in over the last five years. However, over 30% nominated lack of suitable staff, behind only high freight and transport options/costs, as the factor currently constraining the business from achieving its goals (TIA 2018). Thus, there appears to be a belief that a lack of skills was constraining their business yet investing in training appears to be low in the company's priorities in this sector.

It is in bridging this disconnection that the University of Tasmania's Tasmanian Institute of Agriculture (TIA) could play a pivotal role. It operates in three locations in the North West: the Dairy Research Facility at Elliot behind Burnie; the Cuthbertson Research Laboratories at the Cradle Coast Campus; and, the Vegetable Research Facility at Forthside. It is integrated with local agricultural businesses but less so in terms of catering for North West coast students, including a three-day free annual camp on the North West coast for year 11 and 12 students interested in finding out about careers in agriculture. However, if a North West coast student decides to enrol in one of the TIA's two undergraduate degrees they must move to Hobart, which acts as a deterrent for further studies by students from the region. However, honours and post graduate students can conduct their projects in the North West. It is planned that the TIA Cuthbertson Research Laboratories will move to West Park

when this building is completed (TIA 2018; University of Tasmania 2018) which may raise the Institute's profile and attract more students to the Institute's North West campus. In this sense, there appears to be a potential disconnect between the University and the focus of skills training. One task is to decide whether this is a labour market shortage rather than a skills shortage, or is it a combination of both.

While most business community leaders valued education's role in skills development and supported the idea that increased student retention beyond year 10 was vital, there were some who were locked-in to a North West coast of the past. These business community leaders, having completed school at Year 10 themselves, saw Year 10 education and on the job training as the means for young people to acquire the skills they needed to work in their business. In their eyes, Year 12 completion was seen as hindering the development of soft and generic skills such as hard work and discipline (Corbett et al. 2017).

This indicates a complex interaction between employers' own experiences, industry needs and the prioritising of skills development in the North West workforce. An important aspect of the view that Year 10 was all that was required is that is a retrospective view, based on norms that may not widely apply to new industries and new ways of working. This indicates that this is a topic for further research, as additional interviews could further illuminate this aspect of the political economy of skills in North West Tasmania.

6 Innovative Interventions

Given the depth of deindustrialisation and the challenges facing the region in terms of social disadvantage and low educational attainment, a long-term approach is required. The community and businesses have worked collectively to engage with families and children to increase educational retention and completion in the region through improving the relationship between industry and schools. The Burnie City Council has taken a lead role in this with *Burnie Works*, which aims to "create a new culture of working collectively to create change in our community". It has a number of aspects:

- The 10 Families Project works with the entire families to ensure the students attend school and remain connected to education.
- Dream Big aims to expose Grade Five students who come from jobless households to the world of work by visiting workplaces and educational institutions with the aim of opening the door to broader possibilities than they may currently see for themselves. This project involves 100 local businesses and four local primary schools.
- BIG, which is a community industry and education group that aims in particular to support young people on their pathway to a vocation and "develop a strong regional skills base to support emerging economic opportunities" (Burnie City Council 2018).

The TasTAFE provides training that links skill development to the region's needs. The Burnie campus of TasTAFE is the largest public provider of vocational education and training (VET) in Tasmania and is co-located with Hellyer College. There are other campuses in Smithton and Devonport, and the latter offers hospitality training through the Devonport Drysdale restaurant. In 2016 the North West had 8,043 TasTAFE students, which represented 24% of the total enrolments (TasTAFE 2016). There are 159 courses offered in the North West, including short courses, an Advanced Diploma of Building Surveying, and Working with Children and Adults with a Disability (TasTAFE 2018b). Of these, some are offered only in the North West and appear to be aimed specifically at the region's future skill needs in agriculture, advanced manufacturing, and health and community services. Many of the Diploma and Advanced Diploma courses offer articulation arrangements where students can obtain credit or advanced standing for entry into University of Tasmania degrees (TasTAFE 2018a).

While TasTAFE can cater for the region's immediate skill needs, there has been a realisation that to overcome the problems of entrenched disadvantage and poor familial attitudes towards education, initiatives need to be taken that provide long-term focus on school children and their families. The University of Tasmania, in partnership with the State Government, has established the Peter Underwood Centre for Educational Attainment. The aim of the Centre is to improve teaching methods, research the best ways to improve student retention rates over the next 10 to 15 years, increase student aspiration and change Tasmania's socio-economic context (ABC 2017; Rodwell 2017). One of the Centre's achievements on the North West coast has been the Children's University, which "enhances student's academic achievements and increases their ambition to learn". Under this program, students aged between 7 and 14 are issued with a *Passport to Learning* by their school, and then undertake a number of hours of validated activities that range from

participation in sporting clubs, cultural activities and school clubs, with all of the activities linked in some way to a university course.

As part of this approach, Children's University members can visit University facilities on the North West coast, such as the Tasmanian Institute of Agriculture Forthside Vegetable Research Facility, to expose the students to new technology such as farm drones and encourage them to explore an area of employment they may not have considered that is linked to Tasmania's future. When the students meet the required hours of participation they graduate. In 2017, 38 students in the North West graduated and as a reward participated in the Cradle Coast campus Burnie town and gown graduation parade (Peter Underwood Centre 2018; University of Tasmania 2018).

7 Assessment

The North West coast is transitioning away from its industrial past and is confronting the aftermath of poor educational outcomes and disadvantage by taking a collective, long-term approach that includes community, the training sector and industry. Government, and particularly Local Government, is engaging with families and the community to overcome long-term and entrenched attitudes towards education and training and reorient the community and its aspirations towards the jobs of the future, as well as current employment in the growing advanced manufacturing and health sectors. There is a recognition that there is not a simple solution to these issues and that industry, educational institutions and the community need to work together to provide local people with the aspirations, education, skills and jobs to lift the regional economy. There are, of course, some tensions and contradictions and further research is needed to bring those to light and suggest solutions.

The analysis makes three core points:

First, the relationship between education and labour markets is reflected in education attainment levels and labour market outcomes. The data indicates that school retention and completion rates are not only improving but are above the rates elsewhere in the State. Nonetheless, when this profile is placed alongside labour market restructuring it suggests that a targeted approach to educational retention and completion is a key of objective for strategies to address lock-in. Of course, the enduring feature of the low education levels in the region result from a combination of institutional factors, including: the historic uneven provision of final year studies at a secondary school level; the limited resource to secure a transition to universal final year study; the cultural outlooks of households often based on past experience with labour market engagement; and, the unevenness of employment demand across the region.

The second point arising from the analysis is the importance of labour market restructuring and the facilitation of this in both a sustainable and an inclusive way. Clearly there has been a major move away from the traditional industries that have previously defined the region, but the employment and participation rates, relative disadvantage and low productivity in the region are indicative of industrial lock-in. To move forward it is suggested that restructuring strategies should be aimed at two aspects of the regional economy:

- The sectors identified through this research that are reliant on an imported workforce to operate in the North West, such as advanced manufacturing and health care.
- The foundational economic features of the region, those goods and services that are embedded within the economy, as social, economic and material infrastructure (Bowman et al. 2014), which includes utilities, financial services, health and social care and education.

The third point is conceptual. The study demonstrates that the recombination of institutions that comprise the regional ecosystem involve complex processes, as

noted by (Martin 2010), while steps forward require targeted initiatives as indicated above. The demonstration here shows the need to consider incremental and seemingly fragmented processes to create the basis for enabling change to mitigate lock-in. It requires a recalibration of the strengths of the past – resources, organisational forms, technological bases, workforce skills and experiences – to enable the possibility of sustainable and prosperous futures (Hassink 2010). Hence, reskilling, upskilling and cross-sector skilling, and the capacities thus enabled, can become an impetus for change by firms and services in a region, with benefits flowing on to the community. This can be accomplished with targeted education and skills development programs that may foster and valorise change, even within relatively stable employment and organisational practices (Carlsson 2006; Menzel & Fornahl 2007).

8 Conclusion and Recommendations

The study addresses the puzzle of the apparent intractability of securing sustainable and inclusive transition in regions dominated by traditional industries and the reliance on resource extraction. Rather than affirm stability and continuity, the analysis seeks to identify ways of promoting change at a regional level, via education and learning strategies. In this way it promotes steps to overcome the barriers to change as captured in analyses of lock-in. The task is to promote education and learning as an impetus to change by firms and services in the region. It requires targeted education and skills programs

The recommendations that arise from the analysis are fourfold:

1. **Continue the assessments of the areas of regional employment strength and growth – health care, education and retail and manufacturing.** This type of analysis is already undertaken by the Cradle Coast Authority, and it is important to continue evaluating the outcomes of the training programs in pace within the region.
2. **Promote and support an on-going analysis of the regional labour market and the skills requirements, focusing on the place-based features of the regional labour market.** Build on the steps taken to re-evaluate the provision and processes of learning in the region. The means of doing this would be best served by supporting the Cradle Coast Authority.
3. **Promote and extend the on-going interactions between secondary schools, VET and higher education**. This may require state sponsorship and active support over the long-term.
4. **Promote learning experimentation and resource use**. The Children's University is one example.

9 References

ABC 2013, *Jobs go as Devonport weaving mill closes*, viewed <http://www.abc.net.au/news/2013-07-29/jobs-go-as-devonport-weaving-mill-closes/4851130>.

ABC 2017, *University of Tasmania offers shorter, cheaper courses focussed on jobs*, viewed 27 November 2018, <https://www.abc.net.au/radionational/programs/scienceshow/university-of-tasmania-offers-shorter,-cheaper-courses-focussed/9070704#transcript>.

ABS 2009, *ANZSCO - Australian and New Zealand Standard Classification of Occupations, First Edition, Revision 1 Cat. No. 1220.0* Commonwealth of Australia, Canberra.

ABS 2011a, *Australian Statistical Geography Standard* Commonwealth of Australia, viewed <http://www.abs.gov.au/websitedbs/D3310114.nsf/home/Australian+Statistical+Geography+Standard+(ASGS)>.

ABS 2011b, *Census of Population and Housing*, Commonwealth of Australia, Canberra.

ABS 2016a, *1270.0.55.005 - Australian Statistical Geography Standard (ASGS): Volume 5 - Remoteness Structure, July 2016* Australian Government, viewed 16 Dec 2018, <http://www.abs.gov.au/ausstats/abs@.nsf/mf/1270.0.55.005>.

ABS 2016b, *Census of Population and Housing*, Commonwealth of Australia, Canberra.

ABS 2016c, *Census of Population and Housing: Census Dictionary Australia, Catalogue No. 2901.0*, Commonwealth of Australia, Canberra.

ABS 2016d, *Census of Population and Housing: Socio-Economic Indexes for Areas (SEIFA), Australia, Catalogue No. 2901.02033.0.55.001*, Commonwealth of Australia, Canberra.

ABS 2017, *Births, Australia, 2016, Cat No. 3301.0* Commonwealth of Australia, Canberra, <http://www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/3301.0Main%20Features42016>.

Alexander, A 2005, 'Vegetables Other Than Potatoes', in A Alexander (ed.), *The companion to Tasmanian history*, Centre for Tasmanian Historical Studies, University of Tasmania, <http://www.utas.edu.au/library/companion_to_tasmanian_history/V/Vegetables.htm >.

Artibus Innovation 2018, *Project Brief 1 - Certificate III in Remote Area Building Repairs and Maintenance*, Artibus Innovation, Hobart.

Australian Bureau of Statistics 2016, *Census of Population and Housing: Census Dictionary*, Commonwealth of Australia, Canberra, <http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/2901.0Chapter26552016>.

Australian Institute of Health and Welfare 2018, *Older Australia at a glance*, Canberra, <https://www.aihw.gov.au/reports/older-people/older-australia-at-a-glance/contents/social-and-economic-engagement/employment-and-economic-participation>.

Australian National Audit Office 2011, *Indigenous Employment in Government Service Delivery*, Commonwealth of Australia, Canberra, <https://www.anao.gov.au/work/performance-audit/Indigenous-employment-government-service-delivery>.

Australian Workforce and Productivity Agency 2013, *Human capital and productivity Literature review*, Commonwealth of Australia, Canberra, <https://docs.education.gov.au/system/files/doc/other/human-capital-and-productivity-literature-review-march-2013.pdf>.

Barton, R & Fairbrother, P 2014, 'What can unions do? Addressing multinational relocation in North West Tasmania', *Journal of industrial relations*, vol. 56, no. 5, pp. 691-708.

Baum, S, Bill, A & Mitchell, W 2008, 'Unemployment in Non-Metropolitan Australia: integrating geography, social and individual contexts', *Australian Geographer*, vol. 39, no. 2, pp. 193-210.

Becker, GS 1994, 'Human capital revisited', in *Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education (3rd Edition)*, The University of Chicago Press, pp. 15-28.

Beer, A 2015, 'Structural adjustment programmes and regional development in Australia', *Local Economy*, vol. 30, no. 1, pp. 21-40.

Beer, A & Clower, T 2009, 'Specialisation and growth: evidence from Australia's regional cities', *Urban Studies*, vol. 46, no. 2, pp. 369-389.

Beer, A & Clower, T 2014, 'Mobilizing leadership in cities and regions', *Regional Studies, Regional Science*, vol. 1, no. 1, pp. 5-20.

Bill, A & Mitchell, W 2006, 'Great Expectations-migration and labour market outcomes in Australia', *Constraints to Full Employment: Fiscal and Monetary Policy, WorkChoices and Job Insecurity, The*, vol., p. 25.

Billett, S, Choy, S, Dymock, D, Smith, R, Henderson, A, Tyler, M & Kelly, A 2015, 'Towards More Effective Continuing Education and Training for Australian Workers', *National Centre for Vocational Education Research (NCVER)*, vol.

Bowman, A, Ertürk, I, Froud, J, Johal, S & Law, J 2014, 'The end of the experiment?: From competition to the foundational economy', vol.

Brown, P 1999, 'Globalisation and the political economy of high skills', *Journal of education and work*, vol. 12, no. 3, pp. 233-251.

Buchanan, J, Schofield, K, Briggs, C, Hager, P, Hawke, G, Kitay, J, Meagher, G, Macintyre, J, Mounier, A & Ryan, S 2001, *Beyond flexibility: Skills and work in the future*, NSW Board of Vocational Education and Training, Sydney, <<http://www.bvet.nsw.gov.au/pdf/beyondflex.pdf>.>.

Buchanan, J, Scott, L, Yu, S, Schutz, H & Jakubauskas, M 2010, *Skills demand and utilisation*, OECD Local Economic and Employment Development (LEED) Working Papers, OECD Publishing.

Bureau of Infrastructure Transport and Regional Economics 2014, *The evolution of Australian towns*, Canberra.

Burnie City Council 2018, *Burnie Works*, viewed <https://burnieworks.com.au/index.html >.

Campbell, JL 2004, *Institutional change and globalization*, Princeton University Press.

Carlsson, B 2006, 'The role of public policy in emerging clusters', *Cluster Genesis*, vol., pp. 264-278.

Cassidy, J 2005, 'Dairying', in A Alexander (ed.), *The companion to Tasmanian history*, Centre for Tasmanian Historical Studies, University of Tasmania, <http://www.utas.edu.au/library/companion_to_tasmanian_history/V/Vegetables.htm >.

Chen, C-L & Hall, P 2013, 'Using High Speed Two to Irrigate the Regions', *Built Environment*, vol. 39, no. 3, pp. 355-368.

Collits, P & Rowe, JE 2015, 'Re-imagining the region', *Local Economy*, vol. 30, no. 1, pp. 78-97.

Connolly, E & Lewis, C 2010, 'Structural change in the Australian economy', *RBA Bulletin, September*, vol., pp. 1-9.

Corbett, M, Fraser, S, Reaburn, R, Smith, H, Roberts, J & Fielding-Wells, J 2017, 'Building a new generation: Community Expectations on raising aspirations in rural Tasmania', *Australian & International Journal of Rural Education*, vol. 27, no. 3.

Cranston, N, Watson, J, Allen, J, Smith, C, Wight, S, Roberts, W & Kameniar, B 2014, 'Factors impacting on student retention beyond year 10 in rural, regional and disadvantaged communities in

Tasmania-A wicked problem. University of Tasmania', *Retrieved from University of Tasmania Web site: http://www. utas. edu. au/data/assets/pdf file/0005/749579/RETENTION REPORT OCT*, vol.

Crook, S 2018, *Fixing the shortage of specialist science and maths teachers will be hard, not impossible*, The Conversation, viewed 4 Feb 2019, <https://theconversation.com/fixing-the-shortage-of-specialist-science-and-maths-teachers-will-be-hard-not-impossible-99651>.

Crouch, C 2005, *Capitalist diversity and change: Recombinant governance and institutional entrepreneurs*, OUP Oxford.

Deloitte 2017, *Northern Territory Economic Development Framework*, Northern Territory Government, Darwin, <https://cmsexternal.nt.gov.au/__data/assets/pdf_file/0008/434546/economic-development-framework.pdf>.

Deloitte Access Economics 2015, *Economic impact of shale and tight gas development in the NT*, Deloitte Access Economics.

Denham, T 'Metro-bound commuting and regional development: evidence from Victoria', Adelaide, South Australia, 28-30 November 2017, Australian Cities Research Network,

Denham, T 2018, 'Regional Fast Rail and Regional Development: Irrigation or Desertification?', paper presented to ATRF Darwin,

Department of Jobs and Small Business 2016, *Structural Adjustment Programs*, Australian Government, viewed 31 Jan 2019, <https://www.jobs.gov.au/annual-report-2016/structural-adjustment-programs>.

Department of Jobs and Small Business 2018a, *Labour Market Information Portal: ABS Labour Force Regions - SA4 Data*, Australian Government viewed <http://lmip.gov.au/maps.aspx#layer=LabourForceRegions>.

Department of Jobs and Small Business 2018b, *Regional Employment Trials Program*, Australian Government, viewed 23 January 2019, <https://www.jobs.gov.au/regional-employment-trials-program>.

Dicken, P 2011, *Global Shift: Mapping the Changing Contours of the World Economy*, Guilford Press.

Eslake, S 2017, 'Education, Productivity and Economic Performance: Tasmania Then, Now and Tomorrow', vol.

Evans, A 2018, 'Evidence of the added-worker and discouraged-worker effects in Australia', *International Review of Applied Economics*, vol. 32, no. 4, pp. 472-488.

Evans, C, Stroud, D & Fairbrother, P 2013, *An International Study of Comparator Cases*, Skilling the Bay Geelong – Regional Labour Market Profile, Centre for Sustainable Organisations and Work, Melbourne.

Fairbrother, P, Snell, D, Bamberry, L, Vega, DC, Homsey, C, Toome, E, Cairns, G, Stroud, D, Evans, C & Gekara, V 2013, 'Skilling the Bay-Geelong regional labour market profile, final report', vol.

Forbes, M & Barker, A 2017, 'Local labour markets and unemployment duration', *Economic Record*, vol. 93, no. 301, pp. 238-254.

Fox, T & Gelade, S 2008, *Reality check: matching training to the needs of regional Australia*, National Centre for Vocational Education Research.

Glaeser, E 2011, *Triumph of the city: How our greatest invention makes US richer, smarter, greener, healthier and happier*, Pan Macmillan.

Grabher, G 2002, 'Cool projects, boring institutions: temporary collaboration in social context', *Regional studies*, vol. 36, no. 3, pp. 205-214.

Green, F, Machin, S & Wilkinson, D 1998, 'The meaning and determinants of skills shortages', *Oxford Bulletin of Economics and Statistics*, vol. 60, no. 2, pp. 165-187.

Griffin, T 2014, 'Disadvantaged Learners and VET to Higher Education Transitions. Occasional Paper', *National Centre for Vocational Education Research (NCVER)*, vol.

Gruen, N 2018, *The case for an Evaluator General: Why we need it and how we should configure it*, viewed <https://www.themandarin.com.au/101608-nicholas-gruen-evaluator-general-how-we-should-configure-it/>.

Gurran, N, Norman, B & Hamin, E 2016, 'Population Growth and Change in Non-Metropolitan Coastal Australia', *Parallel Patterns of Shrinking Cities and Urban Growth: Spatial Planning for Sustainable Development of City Regions and Rural Areas*, vol., p. 165.

Hassink, R 2010, 'Locked in decline? On the role of regional lock-ins in old industrial areas', in *The handbook of evolutionary economic geography*, Edward Elgar Publishing.

Holmes, L 2017, 'Graduate Employability: Future directions and debate', in *Graduate employability in context*, Springer, pp. 359-369.

Hugo Centre for Migration and Population Research n.d., *Accessibility/Remoteness Index of Australia (ARIA)*, viewed <https://www.adelaide.edu.au/hugo-centre/spatial_data/aria/>.

Jakobsen, ML, Baekgaard, M, Moynihan, DP & van Loon, N 2017, 'Making sense of performance regimes: Rebalancing external accountability and internal learning', *Perspectives on Public Management and Governance*, vol. 1, no. 2, pp. 127-141.

Kearns, P, Bowman, K & Garlick, S 2008, *The double helix of vocational education and training and regional development*, National Centre for Vocational Education Research.

Kempton, H 2015, 'Caterpillar to shed 280 jobs in Burnie', *The Mercury*, <http://www.themercury.com.au/news/tasmania/caterpillar-to-shed-280-jobs-in-burnie/story-fnj4f7k1-1227298342501 >.

Kempton, H 2017, 'Murray Goulburn cuts end ‘Great Australian Dream’ for Edith Creek employee Brendan Costello', *The Mercury*, <http://www.themercury.com.au/news/politics/murray-goulburn-cuts-end-great-australian-dream-for-edith-creek-employee-brendan-costello/news-story/cc9745cceab09edb3f5a22f114a1d6b0>.

Kennedy, S & Hedley, D 2003, *A Note On Educational Attainment And Labour Force Participation In Australia*, Treasury Working Paper, Australian Treasury, Canberra, <http://archive.treasury.gov.au/documents/744/PDF/Education%20and%20participation.pdf >.

Kristensen, PH & Morgan, G 2012, 'From institutional change to experimentalist institutions', *Industrial Relations: A Journal of Economy and Society*, vol. 51, pp. 413-437.

Lagerholm, M & Malmberg, A 2009, 'Path dependence in economic geography', *Chapters*, vol.

Lamb, S, Maire, Q, Walstab, A, Newman, G, Doecke, E & Davies, M 2018, 'Improving participation and success in VET for disadvantaged learners', vol.

Lavesson, N 2015, *When and how does commuting to cities influence rural employment growth?*

Leigh, A 2018, *Building a better feedback loop: Labor to establish an Evaluator General*, ALP, Canberra, Nov 13, 2018, <http://www.andrewleigh.com/building_a_better_feedback_loop_labor_to_establish_an_evaluator_general_media_release>.

Lloyd, C & Payne, J 2002, 'Developing a political economy of skill', *Journal of education and work*, vol. 15, no. 4, pp. 365-390.

Long, M 'Setting the pace',

Martin, R 2010, 'Roepke lecture in economic geography—rethinking regional path dependence: beyond lock-in to evolution', *Economic geography*, vol. 86, no. 1, pp. 1-27.

McKenzie, F 2004, 'Understanding Regional Skill Shortages: A Review of Recent Australian Government Policy', *Australasian Journal of Regional Studies, The*, vol. 10, no. 3, p. 331.

Menzel, M-P & Fornahl, D 2007, 'Cluster life cycles-dimensions and rationales of cluster development', vol.

Mitchell, WF & Stimson, R 2010, *Creating a new geography of functional economic regions to analyse aspects of labour market performance in Australia*, Centre of Full Employment and Equity, University of Newcastle.

Neville, I 2014, *West and North West Tasmania*, Paper presented to the Labour Market Research and Analysis Branch, Department of Employment, 22 September http://docs.employment.gov.au/system/files/doc/other/tasmania_west_and_north_west_presentation.pdf

OECD 2005, *How persistent are regional disparities in employment: the role of geographic mobility*, Employment Outlook, OECD.

OECD 2009, *Structural Analysis Statistics (STAN) Online Database*, Organisation for Economic Co-operation and Development, viewed <http://www.oecd.org/trade/statisticaldatabasesoecdstructuralanalysisstatisticsstanonlinedatabase.htm>.

Parr, JB 2014, 'The regional economy, spatial structure and regional urban systems', *Regional studies*, vol. 48, no. 12, pp. 1926-1938.

Partridge, MD, Ali, K & Olfert, M 2010, 'Rural-to-Urban Commuting: Three Degrees of Integration', *Growth and Change*, vol. 41, no. 2, pp. 303-335.

Partridge, MD, Rickman, DS, Olfert, MR & Tan, Y 2015, 'When spatial equilibrium fails: Is place-based policy second best?', *Regional studies*, vol. 49, no. 8, pp. 1303-1325.

Payne, J 2008, 'Skills in context: what can the UK learn from Australia's skill ecosystem projects?', *Policy & Politics*, vol. 36, no. 3, pp. 307-323.

Payne, J & Keep, EJ 2011, 'One step forward, two steps back? Skills policy in England under the coalition government', vol.

Perkins, C & Brindley, M 2014, *Summary of Stakeholder Consultation: Skills Audit of Job Seekers in the Devonport Region North West Tasmania*, Regional Development Australia, Tasmania, <https://www.rdatasmania.org.au/client-assets/documents/documents-and-reports/RDA%20DCCI%20Skills%20Audit%20040214.pdf>.

Peter Underwood Centre 2018, *Children's University Tasmania*, viewed 23 November 2018., <http://www.utas.edu.au/underwood-centre/aspiration-attainment/childrens-university-tasmania>.

Productivity Commission 2014, *Geographic Labour Mobility*, Research Report, Australian Government, Canberra.

RAI/Cradle Coast Authority 2018, 'Cradle Coast Region Pathfinder Regional Growth Strategy', vol.

Regional Australia Institute 2014, *Foundations of Regional Australia*, RAI, Barton, ACT.

Regional Australia Institute 2018, *The indicators of, and impact of, regional inequality'. Submission to Australia Senate Standing Committees on Economics into the indicators of, and impact of, regional inequality in Australia*, Regional Australia Institute, Barton, <http://www.regionalaustralia.org.au/home/wp-content/uploads/2018/06/180503-RAI-The-indicators-of-and-impact-of-regional-inequality-in-Australia.pdf>.

Robson, L 1991, *A History of Tasmania: Volume II Colony and State from 1856 to the 1980*, Oxford University Press, Melbourne.

Rodman, S 2018, 'This College is going plaves', *O2t*, vol. no. 10, July.

Rodwell, G 2017, ''A bridge too far?'The politics of Tasmanian school retention rates', *Issues in Educational Research*, vol. 27, no. 1, p. 151.

Seddon, T, Clemans, A & Billett, S 2005, 'Social partnerships: Practices, paradoxes and prospects of Local Learning Networks', *The Australian Educational Researcher*, vol. 32, no. 1, pp. 25-48.

Seddon, T & Ferguson, K 2009, 'Learning spaces in educational partnerships', in K Te Riele (ed.), *Making schools different: Alternative approaches to educating young people*, Sage, pp. 87-97.

Social Ventures Australia 2016, *A Collective Impact Learning Lab*, viewed 17 December 2018, <https://www.socialventures.com.au/sva-quarterly/collective-impact-learning-lab/>.

Spenner, KI 1990, 'Skill: meanings, methods, and measures', *Work and Occupations*, vol. 17, no. 4, pp. 399-421.

Spiteri, S 2014, *Disadvantaged locations and transition: Lived lives of students demonstrating resilience*.

Stasz, C 2001, 'Assessing skills for work: two perspectives', *Oxford economic papers*, vol. 53, no. 3, pp. 385-405.

Stone, KVW 2017, 'Green shoots in the labor market: a cornucopia of social experiments', in *Vulnerability and the Legal Organization of Work*, Routledge, pp. 42-64.

Stratford, E 2008, 'Islandness and struggles over development: A Tasmanian case study', *Political Geography*, vol. 27, no. 2, pp. 160-175.

Summers, M 2005, 'Tioxide', in A Alexander (ed.), *The companion to Tasmanian history*, Centre for Tasmanian Historical Studies, University of Tasmania, <http://www.utas.edu.au/library/companion_to_tasmanian_history/V/Vegetables.htm >.

Sutton, G, McLeod, C, Fraser, S & Corbett, M 2017, 'Disrupting Perception: Mapping An Understanding Of Educational Attainment', *Australian & International Journal of Rural Education*, vol. 27, no. 3.

TasTAFE 2016, *TasTAFE Annual Report 2015/2016*, viewed <https://doccentre.tastafe.tas.edu.au/Documents/TasTAFE%20Annual%20Report%202016.PDF>.

TasTAFE 2018a, *TasTAFE and University work together to improve education opportunities*, viewed <https://www.tastafe.tas.edu.au/news/2018/09/tastafe-and-university-work-together-to-improve-education-opportunities/>.

TasTAFE 2018b, *TasTAFE Student Information Guide 2018*, viewed <https://doccentre.tastafe.tas.edu.au/Documents/TasTAFE%20Student%20Information%20Guide%202018.pdf>.

Tholen, G 2017, *Graduate Work: Skills, Credentials, Careers, and Labour Markets*, Oxford University Press.

TIA 2018, *TasAgFuture Regional Report: Cradle Coast,* , viewed 28 November 2018, <https://data.surveygizmo.com/r/621472_5ba7c3acd94bd2.63679599>.

Tighe, P 1992, 'Hydroindustrialisation and conservation policy in Tasmania', *Australian Environmental Policy–ten case studies. New South Wales University Press Ltd, Kensington, NSW*, vol., pp. 124-155.

Toner, P 2005, *Keeping Up with Technology: A Pilot Study of TAFE and The Manufacturing Sector*, ERIC.

Toner, P 2011, 'Workforce Skills and Innovation: an overview of major themes in the literature'OECD Science', *Technology and Industry Working Papers*, vol. 1.

University of Tasmania 2016, 'Transforming Lives. Transforming Cities. A partnership proposal to deliver an Education-Driven Revitalisation of Northern Tasmania.', vol.

University of Tasmania 2018, *North-West Coast students experience Tasmania's farming future*, viewed 27 November 2018, <http://www.media.utas.edu.au/general-news/all-news/north-west-coast-students-experience-tasmanias-farming-future>.

Vallas, SP 1990, 'The concept of skill: A critical review', *Work and Occupations*, vol. 17, no. 4, pp. 379-398.

Wilson, B, Abbott, T, Quinn, SJ, Guenther, J, McRae-Williams, E & Cairney, S 2018, 'Empowerment is the Basis for Improving Education and Employment Outcomes for Aboriginal People in Remote Australia', *The Australian Journal of Indigenous Education*, vol., pp. 1-9.