

# ‘Rare and vital’: positive terminology, contemporary relevance and robust teaching options for heritage maker trades

## ‘Raro e vital’: terminologia positiva, relevância contemporânea e opções de ensino sólidas para os ofícios criadores de património

ALISON WAIN<sup>1\*</sup> JESSE ADAMS STEIN<sup>2</sup> MITCHELL CLEGHORN<sup>3</sup>1. University of Canberra, Bruce  
ACT 2617 Australia2. University of Technology  
Sydney, PO Box 123, Broadway  
NSW 2007 Australia3. Conservatora Heritage  
Services, Perth WA 6019 Australia

\*alison.wain@canberra.edu.au

### Abstract

Manual trades from the past are often referred to negatively as ‘lost’, ‘dying’ or ‘forgotten’, driving perceptions that such skills are unimportant in the present and future. Such trades, however, remain vital in some industries, promote wellbeing and social empowerment and are important for meeting United Nations Sustainable Development Goals (SDGs). This paper puts forward constructive and positive alternative terminology for these skills, including ‘rare’, ‘vital’, ‘heritage’ and ‘maker trades’. The second section engages with issues in teaching these skills effectively. This includes educational and economic contexts, student and teacher expectations and issues such as accreditation and certification. The third section of this paper discusses practical solutions for teaching these skills in contemporary educational settings. Options include embracing work integrated learning (WIL) paths within broader tertiary courses, targeting mid-career learners, and splitting skill acquisition into base maker skills and specific industry skills for more distributed teaching opportunities.

### Resumo

As profissões manuais do passado são muitas vezes referidas negativamente como ‘perdidas’, ‘moribundas’ ou ‘esquecidas’, levando a pensar que não são importantes no presente e futuro. Estas profissões continuam a ser vitais em algumas indústrias, promovem o bem-estar e a capacitação social, e cumprem os Objectivos de Desenvolvimento Sustentável (Nações Unidas). Propomos uma terminologia alternativa construtiva e positiva para estas competências, incluindo os termos ‘raras’, ‘vitais’, ‘patrimoniais’ e ‘ofícios criadores’. Abordamos questões relacionadas com o ensino destas competências. Incluindo contextos educativos e económicos, expectativas dos alunos e dos professores e questões como a acreditação e certificação. Finalmente, discutimos soluções práticas destas competências para o ensino atual. As opções incluem: a adoção de percursos de aprendizagem integrada no trabalho com cursos de formação mais amplos, visando estudantes a meio de carreira; e garantir oportunidades de ensino mais distribuídas, separando a aquisição de competências em competências básicas do criador e competências específicas da indústria.

### KEYWORDS

Trades  
Makers  
Heritage  
Skill  
Training  
Conservation

### PALAVRAS-CHAVE

Ofícios  
Criadores  
Património  
Competência  
Formação  
Conservação

## Introduction

Trades and manual skills with a long history - and little contemporary uptake - are often labelled as 'lost trades' or 'dying arts' [1-4]. These negative terms contribute to perceptions that these skills are no longer relevant in either the contemporary world or the future, devaluing them in the eyes of education institutions, government agencies, companies, students, employers, and society at large. This means that there is a significant risk that such skills will not be transferred to future generations. This paper argues that the continuation of heritage skills and traditional trades is vital, both for heritage and practical reasons. The paper focuses on the trades represented in our research, with an emphasis on making and repairing physical things in the worlds of construction, artisanal production and manufacturing. Our arguments, however, apply more generally, encompassing other rare trades, skills and maker practices.

Firstly, we propose the development of more positive terminology for such skills, including the use of terms such as 'rare', 'vital', 'heritage' and 'maker trades'. Secondly, we identify practical and aspirational issues that affect the teaching of heritage maker trades, and look for ways to increase participation and satisfaction for teachers and learners. Thirdly, we discuss structures for economically viable teaching of such skills, including through work integrated learning (WIL) paths within broader tertiary courses. Ultimately, this paper aims to open a wider conversation about how we might identify and teach rare and vital maker trades and how we can find a robust place for them within education systems.

This paper draws together interdisciplinary knowledge from the three authors' backgrounds in heritage preservation, Australian manufacturing and design, and heritage skills training. First author Alison Wain specialises in the preservation of large heritage machinery, engaging with tradespeople who have the knowledge to maintain such machinery and keep it operational, thus preserving both the tangible and intangible aspects of machinery heritage [5]. Second author Jesse Adams Stein is a design researcher who has spent the past 12 years undertaking empirical research into manufacturing tradespeople's experiences [6-7]. Third author Mitch Cleghorn is a built and cultural heritage professional who has prepared and delivered short courses in heritage maker trades, working with Applied Building Conservation Training (the training division of building restoration company HSR (SA)), and on the development of the Certificate III in Heritage Trade Skills accredited by the Australian Skills Quality Authority (ASQA) [8].

As well as drawing on our previous research, we have undertaken targeted interviews and focus groups with tradespeople and heritage workers (details of interviewees and projects are provided in the acknowledgements and references). While our analysis draws principally from Australian examples, we have looked towards international programs to identify alternative models.

## Developing positive terminology

Previously we suggested the use of terms such as 'rare', 'vital', 'heritage' and 'maker trades' to describe the skills and trades that we are discussing in this paper, as we believe that the terminology used to describe them is critically important. Here we further explore these terms to provide a definitional framework for this discussion.

### Maker trades

In the Australian context, a 'trade' usually relates to a qualification: tradespeople train through formal employer-based apprenticeships, which typically feature shorter periods of theory training alongside workplace experience. We need, though, to also define skillsets beyond formalised apprenticeships, as 'trades' have often been gendered as masculine pursuits, with

‘feminine’ arts and crafts historically regarded as less skilled or deserving less remuneration [9]. We therefore use the additional term ‘maker’ to include capacities developed through less formal and/or self-taught pathways, which nonetheless result in highly honed skillsets. We also acknowledge that the term ‘skill’, which has a long and contested history in a number of academic disciplines (for example [10-13] among many others), is both a socially constructed phenomenon and a measurable, practical set of human abilities.

A defining aspect of ‘maker trades’ is that they are not based on the use of automated tooling and digital diagnostics. Automated tooling, which facilitates bulk processing, tends to eliminate difference and devalue judgement. Maker trades may involve the use of powered tools, but their use is mediated by human capacities for care, understanding and specificity, using judgement to design solutions that accommodate difference in materials, needs and preferences. In this context we include industrial manufacturing skillsets, where they are based on a human understanding of materials and their behaviour [7, 14].

The affordances identified above bring us to our other positive terms for maker trades: ‘heritage’, ‘rare’ and ‘vital’. These words are positive descriptors that provide context and add value, as described below.

### **Heritage**

Historical maker trades have relevance for the preservation of tangible heritage, such as buildings and objects, as well as themselves being important bodies of intangible heritage [15]. Artisans and heritage-focused tradespeople have a profound understanding of materials and techniques that embodies a significant body of practical and cultural knowledge. As Grace Barrand [16] points out: “A master chairmaker doesn’t just work with wood, but has a library of knowledge about dozens of tree species, growth patterns, shrinkage characteristics, colour, density, grain and so on”.

### **Rare**

Heritage maker trades were not rare during their ‘heyday’, and they are not qualitatively distinct just because they are rare now. The word rare is useful in our context because it connotes something that is unusual, special and of value, rather than something that is obsolete and dying. As Stein found in her empirical research into the steelmaking and textiles industries, manufacturing in Australia is in a situation where rare skills – such as engineering patternmaking, moulding, or garment patternmaking – are still prized and in demand by employers [7].

### **Vital**

Maker trades are vital resources for the present and future. The ‘one size fits all’ approach of automated practices does not provide an adequate response when things do not go to plan. Rather than just a basic applied understanding of their own discrete area, skilled tradespeople and experienced makers have in-depth production knowledge across a broad range of industrial and craft processes, and are able to anticipate issues before they occur, solve problems, and create practical, manual solutions when technologies break down or produce poor results. Their understanding of layers of complexity provides skill bases that are resources for adapting to change in uncertain times [17].

Maker trades are especially vital where monetary, educational and physical resources are minimal and the infrastructure to support highly automated systems is not available. For example, such trades have particular use in areas disrupted by natural disasters or conflict, in remote regions, in regions with less economic and technological development, and for use by individuals or small businesses. These skills are therefore vital for meeting the United Nations Sustainable Development Goals (SDGs), in particular Goal 9 to “promote inclusive and sustainable industrialization and foster innovation” and Goal 12 to “Ensure sustainable consumption and production patterns” [18].

## Understanding issues, imagining possibilities

### Course duration and structure

In the previous section, we identified the affordances of rare and vital heritage maker trades – the reasons we should preserve them. Preservation, however, requires new generations of people to learn and practice these trades and unfortunately, there are few opportunities to do this. In this section, we examine issues affecting rare trades teaching and identify factors that can improve success rates in this space.

A twentieth century trade apprenticeship in Australia took approximately four years, combining trade school attendance with work placement at a company or government department. A 2010 report on heritage trades teaching undertaken for the Heritage Chairs and Officials of Australia and New Zealand (the HCOANZ Report) concluded that this format is pedagogically beneficial but relatively costly and inflexible. Shorter courses were considered more accessible and achievable, but were not seen to provide enough skills for a student to become ‘fully qualified’ [19].

Our research suggests that while a person’s initial apprenticeship provided good foundational skills in a particular area, tradespeople commonly added to this with ‘post-trade’ training, enabling them to curate personal skillsets, take on more challenging work, achieve promotion, and improve self-esteem [20]. Full-time apprenticeships were geared towards young people with minimal commitments outside their studies, while short courses and night school accommodated mature workers with existing commitments.

More recently in the heritage sector in Australia, however, this tradition of adding skills through short and flexibly taught courses seems to have been forgotten, replaced by an assumption that all ‘proper’ courses in heritage trades should follow the traditional ‘first trade’ format of full-time training over three-four years [19]. However, the tertiary education market has changed enormously in recent decades and there are now large numbers of mature students wanting to study, including those interested in rare and vital skills. Some want to build on existing skillsets, some want a career change, some are returning to work after having children, and some just want the skills to undertake the general maintenance, repair and re-use work that is increasingly being recognised as vital to a sustainable society (see for example M. Andrew [21]).

Our research also suggests that a diverse repertoire of niche skills is relevant for an experienced professional who already has established personal and business interests. It is perhaps less relevant for a young person who is just starting their professional journey. Stonemason Richard Senior [22], for example, noted that: “Your mature person... takes an interest in the heritage skills, it’s something that grows on you over time. A 25 year old guy just out of his apprenticeship - and I’ve been there - just wants to make the money, buy the car, buy the house, and make the dollars”.

To take advantage of current demographic shifts in the age and gender of students, the teaching of rare and vital trades should be pitched at both younger and mature student cohorts, and should provide the flexibility that mature students need. This opens up the question of what length of time and depth of engagement would provide a student with a useful level of skill, while also allowing flexibility.

Joeri Januarius runs a Belgian program (*Beurzen voor het doorgeven van vakmanschap in een meester-leerlingtraject*, meaning grants for the transmission of craftsmanship in a master-apprentice model) that provides funding for individual masters and students to work together to transfer rare skills and knowledge. Masters and students collaboratively negotiate their training schedules, with most settling on one or two days a week over 18 months [23].

Senior, working in the Australian context, observed that only one day per fortnight would be too low, but that a full time intensive could be valuable:

*[To] get your hands dirty so to speak, something more fulltime than just sort of one day a fortnight, would [be necessary] ... because by the time you’ve shown somebody how to do one small task, a week or two later they probably need refreshing ... I’d lean to more of the full engagement ... Now, if that was a short, sharp two or three weeks, maybe that would work full time. [22]*

The private Longford Academy in Tasmania, Australia, runs week-long courses aimed at broadening the skillsets of people working in building conservation, such as architects and heritage officers. Asked whether these people could develop a useful practical skillset from attending these shorter courses, Senior responded:

*They’d certainly have a very good understanding of the materials and the principles involved ... [although] the actual physical trade skills ... take years to perfect. But in the heritage field, you’re not looking for somebody to plaster hundreds of square metres of a wall, you’re doing repairs. It would give them a good start. [22]*

Januarius felt that the two-year grants provided by the Belgian program provided “a certain basis, but you still need to work on your skills, because ... you’re not a master yet” [23]. In the Australian context, however, Neil Hogg [24] worried that opportunities for emerging practitioners to continue their development were limited as “the range and scope and number of jobs that they’re working on is much reduced ... they’re not getting those really complex jobs that challenge people”.

### **Opportunity and accessibility**

Trades teaching needs to be broader than just trade-specific skills, as students’ intentions can range from developing a personally satisfying creative practice to making a living wage from their work. Emerging tradespeople wanting to work in the heritage industry need to understand the governance processes required for compliance with heritage standards, which in Australia includes knowledge of the *Australia ICOMOS Burra Charter* [25], *Conservation Management Plans* [26], *Significance 2.0* [27] and other risk management and health and safety regulations.

In Australia, though, there is relatively little work available in the heritage space [19] and museums and other heritage organisations usually have very limited funding. In a successful business, therefore, Jenny Edmonds noted that rare trade work is usually combined with other work to provide a living wage [28]. Jenny Fawbert noted that the *Conservatoire National des Véhicules Anciens* program in France [29] had found that integrating the teaching of heritage skills with modern technologies such as CAD, CAM and 3D printing can attract new generations to develop new processes [30], thus melding the affordances of human judgement and automated reproduction and providing the capacity to take on both heritage and modern projects. Achieving this melding of old and new, however, is likely to require the combination of a variety of teachers and teaching frameworks.

There is evidence that students are more likely to continue their involvement with a trade if they feel they are part of a shared, accepting community [31], but finding one’s place in an established community of practice can be challenging. Stephanie Moore, who trained as a heritage steamfitter commented that “As a younger person who has entered the heritage industry, there tends to be like an old guard, and they keep the knowledge and they hold on to it.” [30] She noted that when people could share their skills and experiences in supportive environments the reluctance to cross social boundaries was significantly reduced, citing the impact of a community motorcycle workshop in Sydney where people could use the facilities to work on their bikes or have work done, and where there was also a café. These facilities meant that “there’s vintage stuff and new stuff in there all the time, so there is quite a mix of people kind of floating through [32].

Environments that encourage mixing between people from different trades have particular potential for creating overarching communities of practice, especially where there are too few practitioners in a trade (or region) to maintain a robust community in a single specialisation, and when many practitioners are of retirement age. One option is to bring people from different trades together: for example an event to which all the masters and students from the Belgian program were invited, regardless of their specialist trade, enabled shared experiences to come to light across trade backgrounds.

### **The challenges of passing on skills**

For students to learn there need to be masters who are willing to teach, and it is important to understand the incentives and barriers to teaching in this space. Both our Australian and Belgian participants said that while money was an enabler, the real incentive for masters to teach was their desire to see their trade continue, and they were often disappointed if a student chose not to pursue the trade they had taught them. Neirinckx [33], however, found that requiring students to make a post-training commitment to the trade was a disincentive, even when masters “are willing to transfer their entire knowledge and equipment to an apprentice who is willing to continue the business”. Part of this reluctance is students’ fears of being trapped in a trade with a limited future, which is a particular problem for trades that are so niche that they are generally supported by heritage institutions, with little opportunity for acquiring other clients [33]. This reflects the earlier point that, to support a robust business, heritage trades need to be innovatively integrated with more commercial practices.

It is important for both students and teachers to recognise the differences in expectations of people who are “dipping their toes” into a trade, versus those who know that they want to study that trade in depth. For masters, this can affect not only how they teach, but whether they are prepared to teach at all. Cleghorn and Barrand [34] and Neirinckx and Januarius [23, 33] had all experienced masters who were not interested in teaching the rudiments of their trade to beginners, or teaching people who only had a passing interest, but who felt that the complexity of what they wanted to teach required students with significant existing knowledge, as well as the passion to take that to a higher skill level. Modern regulatory requirements can also be frustrating for masters who have a lifetime of experience. Cleghorn and Barrand describe the case of a master who had previously taught through the Australian TAFE (Technical and Further Education) vocational system, and sought to return to part-time teaching after retirement. He found, however, that new regulations required him to undertake six months of training to renew qualifications at his own expense, which was a significant disincentive to his participation in teaching [34].

Time and flexibility are other important factors. Hogg [24] commented that even retiree volunteers often do not have the availability to teach a student full-time, and Jennifer Edmonds [28] noted that teaching could severely impact productivity in a professional workplace. Both Edmonds and Senior [22, 28] commented on the advantage of being able to draw on a network of teachers to manage demand for placements, and to match different expectations, personalities and workplaces.

### **Accreditation and certification**

Another issue that impacts the teaching of rare trades is certification and/or accreditation. The precise definition of these terms varies, but certification is generally the process of providing written assurance “that a person, product, or process conforms to specified requirements and standards” and accreditation is generally “an attestation by a third party that an agency has demonstrated competence” [35].

In Australia, trades require the completion of standardised certificates, a process regulated and managed by TAFE or its regional equivalent. While this works for more common trades, it does not suit rare trades where the pool of qualified assessors can be very small. In Australia, distances between major centres also mean that assessors can be unavailable in remote areas.

The TAFE system also does not allow for variations within the teaching of ‘skill families’. For example, steam trades qualifications are still available, but the skills taught, assessed and certified do not include much knowledge that is critical to the safe running and maintenance of heritage steam engines. The development and implementation in Australia of the Certificate III in Heritage Trade Skills is of particular value here, as it supplies a traditionally certified course that actually is focused on skills required for heritage work.

In the United Kingdom the Trailblazer Apprenticeship system was developed to ensure teaching aligns with industry [36]. Under this system, vocational courses are no longer designed by a centrally administered education body, but by groups of a minimum of 10 employers who collaboratively develop a proposal for an apprenticeship, followed by standards and an assessment plan. This provides the opportunity to develop and deliver certified courses that are focused on the skills required for rare trades, and to run them when and where they are needed.

Hogg [24] notes that in Australia there is a proposal currently under discussion to allow approved heritage bodies to become Registered Training Organisations (RTOs), so that they can develop, implement and assess training in the area of operating heritage machinery. Hogg has concerns, however, about the ability of a largely volunteer sector to be able to manage the administrative requirements of such self-regulation, and to provide the number and quality of teachers that will be required, on an ongoing basis [28].

An alternative to certification is accreditation. In the Australian heritage context, accreditation is commonly used by peak bodies to attest to the competency of individuals in professions where training and experience can vary widely between individuals, and where the provision of formal qualifications is not the only way to assess a practitioner’s skill. For example, the Australian Institute for the Conservation of Cultural Material (AICCM) has a Professional Member category, and the Australian Archaeological Association provides an Australian Archaeology Skills “Passport” for professionals deemed to be competent practitioners. Again, however, the extensive administration required by these systems is undertaken by existing members on a voluntary basis, which can cause problems for consistency and efficiency.

## Developing robust teaching structures

Teaching organisations need their courses to be economically viable, which means they must attract enough student enrolments to cover their costs and, often, make at least a small profit. As discussed earlier, the relatively small number of people interested in learning rare trades often falls below ‘viability’. It is therefore necessary to think creatively about how existing opportunities might be woven into flexible, composite structures that provide certainty, flexibility and appropriate levels of skill for industry purposes. The following sections analyse different training options for rare trades teaching, with a focus on opportunities in the Australian context.

### Short course teaching

The HCOANZ report noted that a range of short courses are run on an ad hoc basis by a variety of organisations, including heritage agencies, peak bodies, training organisations, amenity societies and private commercial providers. Respondents to a survey undertaken as part of the HCOANZ report listed short courses as one of the two most popular modes for training (Section 4.1) with the other being ‘on-the-job’ training [19]. The HCOANZ report noted that short courses could be:

*...highly flexible, organised quickly to reflect new needs, delivered in more than one location, and often delivered economically ... However, there are also obstacles ... including the cost*

*and drain on resources of individuals involved ... challenges in logistics and publicity, limited national coordination and a lack of any framework for assessment ...*

Short courses are excellent for filling gaps, addressing short term needs, and assembling personal skillsets for niche businesses, and they are relatively low risk commitments for both providers and participants. Their principal drawback from a teaching point of view is that they tend to only cover specific aspects of the overall skillset required to train a rare trade practitioner. Nonetheless, short courses have the potential to fit well into a flexible professional accreditation framework.

### **TAFE courses**

Formal vocational courses in Australia are run by TAFE (or in the Australian Capital Territory the Canberra Institute of Technology [CIT]), and are centrally driven by government mandate, according to industry demand. Small volume specialist TAFE courses are therefore vulnerable to centralised cuts because of perceived low demand.

One possible solution is that a first-year unit providing, for example, general maker skills, might be successfully run by TAFE, feeding students with basic skills into more advanced units in a number of heritage trade 'families'. There is precedent for this, as the first years of apprenticeships in Australia are often generic. Currently, however, most TAFE introductory (Certificate I-III) training packages are focused on being safe and helpful around the workplace, not on developing good manual skills.

One disadvantage of the TAFE model is the length of the commitment required for a full apprenticeship, which does not provide much flexibility for students. Conversely an advantage of the TAFE model is the reliance on work placements, which ensures that students begin real-world involvement with industry early in their studies.

### **University courses**

Universities are free to teach what they want, and are keen to differentiate from each other, which provides some advantages. As with TAFE, however, their need to make a significant profit means that low-enrolment courses and subjects are vulnerable, unless packaged as electives within broader degrees. Also like TAFE apprenticeships, degrees take a significant amount of time to complete, which is a disincentive for students given the impact of the current cost-of-living crisis on the financial challenges of studying.

One advantage of the university model, however, is flexibility, and therefore capacity to offer the opportunity to incorporate choice for individual students, as well as adapt to industry needs. Wain, first author on this paper, who teaches at the University of Canberra (UC), sees potential opportunities for using existing university teaching structures creatively to accommodate rare trades teaching. Fundamental heritage concepts and materials conservation, for example, are already taught in heritage focused degrees, while in Australia existing work integrated learning (WIL) units can provide a structure for students to undertake practical placements with businesses (or masters) of their choice. In Australia universities also usually provide the option for students to take – with the approval of their course convenor – elective units chosen from either courses and faculties within their own university, units from other universities (through a university wide cross-institutional study arrangement), or units from overseas universities (through student overseas study programs). The university need not, therefore, specifically commit to providing rare trades training, but instead create pathways for students to undertake their chosen rare trade specialisation within an existing, broader degree structure.



## Conclusion

Heritage practices in manufacturing, construction, artisanal craft and engineering maintenance remain alive and important. Consigning them to the paradigmatic dustbin of ‘lost’ and ‘dying’ is a defeatist position that will both discourage people from wanting to learn them, and discourage educational institutions and industry bodies from providing training in these areas.

We therefore advocate for positive terminology that highlights the benefits of continuing to pass on heritage skills and trades to new generations. Core to our proposal is the notion that such skills are ‘rare’ and ‘vital’ and remain relevant, being founded on material making, manual skill and production knowledge. Heritage building trades are still required for the repair and reconstruction of heritage sites and monuments, while high level understandings of materials and process in trades such as garment patternmaking and engineering patternmaking are sought after for precision and innovation in contemporary manufacturing. There are also other benefits that relate to increasing concerns about human and environmental wellbeing: there are demonstrated social and psychological benefits to being trained in a manual skill.

The second section of this paper examined in detail how we might develop more robust teaching structures for viably transferring such skills in the future, managing the tension between shaping course content with heritage preservation in mind versus the need to deliver content that will be seen to be relevant to contemporary issues, for example in repair, maintenance and disaster recovery. Heritage skills and trades can be separated into skill structures and hierarchies for more efficient teaching: for example from more general and basic understandings of safety, materials, machinery and tools, towards more specific skill areas pertinent to a particular trade or practice. In order to plan such forms of training well, it is important to take into account the ambitions and expectations of not only students, but also the ‘masters’ who want to pass on their skills. Issues of expectations, access, certification and accreditation must be considered in the context of existing education systems, with an awareness that much of the existing training in rare heritage skills currently happens informally.

The third section of this paper identified practical and robust teaching structures that could make such skills training possible in the future. There are avenues for rare skills training to be taken through flexible, composite structures that include combinations of short courses, vocational (TAFE) and university environments, to build skillsets and manual capacities over time, in an economically viable manner.

Above all, a realistic understanding of the financial limitations of the Australian educational landscape means that courses need to be economically viable, and to demonstrate relevance to contemporary needs and developments. These relevancies must include not only past expectations of skill outcomes, but also the potential for positive impacts on current concerns, such as the mitigation of materials shortages, waste minimisation, right to repair, skills shortages, wellbeing and lifelong learning, disaster recovery and the fulfilment of Sustainable Development Goals.

### Acknowledgements

Interview projects undertaken by the first author include: *Size Matters: Seeing the Values in Large Technology Heritage*. 2013, PhD thesis Australian National University: Canberra, Australia, <https://openresearch-repository.anu.edu.au/handle/1885/11772>, HREC Ethics approval no. 2007/2257; and *Mind the Gap industry consultation project*, 2021-23, University of Canberra, HREC Ethics approval no. 4630.

**REFERENCES**

1. Romensky, L., 'Hard, dirty foundry work copes with digital disruption and lack of apprenticeship courses', in *ABC News* (2018), <https://www.abc.net.au/news/2018-09-30/hard-dirty-foundry-work-coping-with-digital-disruption/10303254> (accessed 2023-07-30).
2. Harvey, H., 'The dying art of the blacksmith living on in Stratford', in *Taranaki Daily News* (2019), <https://www.stuff.co.nz/taranaki-daily-news/news/115493689/the-dying-art-of-the-blacksmith-living-on-in-stratford> (accessed 2023-07-30).
3. 'Forgotten Trades: selected records of early Australian trades', in *Australian National University Archives Library*, <https://archives.anu.edu.au/exhibitions/forgotten-trades-selected-records-early-australian-trades> (accessed 2023-07-30).
4. Gonzales, D., 'Lost Trade', in *Apple Podcasts* (2023), <https://podcasts.apple.com/us/podcast/lost-trade/id1534727047> (accessed 2023-07-30).
5. Wain, A.; Sherring, A., 'Changeability, variability, and malleability: sharing perspectives on the role of change in time-based art and utilitarian machinery conservation', *Studies in Conservation* **66**(8) (2021) 449-462, <https://doi.org/10.1080/00393630.2020.1860672>.
6. Stein, J. A., *Hot metal: material culture & tangible labour*, Manchester University Press, Manchester (2016).
7. Stein, J. A., *Industrial craft in Australia*, Palgrave Macmillan/Springer, Singapore (2021).
8. '10858NAT - Certificate III in Heritage Trade Skills', in *Training - a joint initiative of the Australian and State Territory Governments*, <https://training.gov.au/Training/Details/10858NAT>.
9. Callen, A., 'Sexual Division of Labor in the Arts and Crafts Movement', *Woman's Art Journal* **5**(2) (1985) 1-6, <https://doi.org/10.2307/1357958>.
10. Patchett, M.; Mann, J., 'Five advantages of skill', *Cultural Geographies* **25**(1) (2018) 23-29, <https://doi.org/10.1177/1474474017739024>.
11. Shields, J., 'A matter of skill: the revival of apprenticeship in early twentieth-century NSW', *Journal of Industrial Relations* **37**(2) (1995) 236-262, <https://doi.org/10.1177/00221856950370020>.
12. Wajcman, J., 'Patriarchy, technology and conceptions of skill', *Work and Occupations* **18**(1) (1991) 29-45, <https://doi.org/10.1177/0730888491018001>.
13. Cockburn, C., 'The material of male power', *Feminist Review* **9** (1981) 41-58, <https://doi.org/10.1057/fr.1981.19>.
14. Shales, E., *The shape of craft*, Reaktion Books, London (2017).
15. Taksa, L., 'Machines and ghosts: politics, industrial heritage, and the history of working life at Eveleigh workshops', *Labour History* **85** (2003) 65-88.
16. Gadd, J., 'Heritage Skills Initiative: Grace Barrand', in *One Hour Out*, <https://onehourout.com.au/melbourne/everywhere/art-and-craft/heritage-skills-initiative-grace-barrand/> (accessed 2023-07-30).
17. Carr, C., 'Repair and care: locating the work of climate crisis', *Dialogues in Human Geography* **0** (2022) <https://doi.org/10.1177/20438206221088381>.
18. 'The 17 Goals', in *United Nations - Department of Economic and Social Affairs*, [THE 17 GOALS | Sustainable Development \(un.org\)](https://www.un.org/sustainabledevelopment/) (accessed 2023-07-30).
19. Godden Mackay Logan, *Heritage Trades and Professional Training Project—Final Report*, Heritage Chairs and Officials of Australia and New Zealand, Melbourne (2010), <http://www.environment.gov.au/system/files/resources/faa70eb8-56ed-4a5e-9030-6afe3ad46f17/files/heritage-trades-training.pdf> (accessed 2023-07-30).
20. Wain, A., Interview with Col Ogilvie, in *Mind the Gap* project, July 31, 2022.
21. Andrew, M., 'Making mending visible', *Axon: Creative Explorations* **11**(2) (2021) 207-221, <https://doi.org/10.54375/001/hgrxkgtlyf>.
22. Wain, A., Interview with Richard Senior, in *Mind the Gap* project, November, 9, 2022.
23. Wain, A., Interview with Joeri Januarius, in *Mind the Gap* project, November, 10, 2022.
24. Wain, A.; Rooney, T., Hogg, N., Interview with Neil Hogg, in *Mind the Gap focus group*, November, 18, 2021.
25. 'The Burra Charter: the Australia ICOMOS charter for places of cultural significance' (2013), in *Australia ICOMOS*, <http://australia.icomos.org/> (accessed 2023-07-30).
26. Kerr, J. S., *The Conservation Plan*, 7th ed., Australia ICOMOS (online) (2013), <https://australia.icomos.org/publications/the-conservation-plan/2013> (accessed 2023-07-30).
27. Winkworth, K.; Russell, R., *Significance 2.0: a guide to assessing the significance of collections*, 2nd ed., Collections Council of Australia, Adelaide (2009), <http://nla.gov.au/nla.arc-1124432009> (accessed 2023-07-30).
28. Wain, A.; Rooney T., Interview with Jenny Edmonds, in *Mind the Gap focus group*, September, 22, 2021.
29. 'Formation longue', in *CNVA - L'École des Véhicules Anciens*, <https://www.le-conservatoire.com/?lang=en> (accessed 2023-07-30).
30. Wain, A.; Rooney, T., Interview with Jenny Fawbert, in *Mind the Gap focus group*, August, 18, 2021.
31. Struthers, K.; Strachan, G., 'Attracting women into male-dominated trades: Views of young women in Australia', *International Journal for Research in Vocational Education and Training* **6**(1) (2019) 1-19, <https://doi.org/10.13152/IJRVET.6.1.1>.
32. Wain, A., Interview with Stephanie Moore, in *Mind the Gap* project, August, 2021.
33. Wain, A., Interview with Pieter Neirinckx, in *Mind the Gap* project, November, 10, 2022.
34. Cleghorn, M.; Barrand, G., 'Connecting with spirit at the home of heritage: a case study in building conservation training in Burra, SA.', ms., 2019 AICCM National Conference - Making Conservation (2019), <https://www.conservatora.com/post/connecting-with-spirit-at-the-home-of-heritage> (accessed 2023-08-04).
35. Knake, M., 'What's the Difference? Accreditation, Certification, and Related Terms', in *AASHTO re:source Newsletter* (2015), <http://aashresource.org/university/newsletters/newsletters/2016/08/05/what-s-the-difference-accreditation-certification-and-related-terms> (accessed 2023-07-30).

36. Team, A. T., 'What are trailblazer apprenticeships?', in *Aspire training Team* (2016), <https://www.aspiretrainingteam.co.uk/what-are-trailblazer-apprenticeships/> (accessed 2023-07-30).

RECEIVED: 2023.5.15

REVISED: 2023.6.30

ACCEPTED: 2023.7.17

ONLINE: 2023.x.xx



This work is licensed under the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License. To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/deed.en>.