IN THE FAIR WORK COMMISSION

Matter No.: AM2014/203 Graphic Arts, Printing and Publishing Award 2010

Re Application by: "Automotive, Food, Metals, Engineering, Printing and Kindred Industries Union" known as the Australian Manufacturing Workers' Union (AMWU)

Submissions of the "Automotive, Food, Metals, Engineering, Printing and Kindred Industries Union" known as the Australian Manufacturing Workers' Union (AMWU)

4 Yearly Review of Modern Awards

COVER SHEET

About the Australian Manufacturing Workers' Union

The Australian Manufacturing Workers' Union (AMWU) is registered as the "Automotive, Food, Metals, Engineering, Printing and Kindred Industries Union". The AMWU represents members working across major sectors of the Australian economy, including in the manufacturing sectors of vehicle building and parts supply, engineering, printing and paper products and food manufacture. Our members are engaged in maintenance services work across all industry sectors. We cover many employees throughout the resources sector, mining, aviation, aerospace and building and construction industries. We also cover members in the technical and supervisory occupations across diverse industries including food technology and construction. The AMWU has members at all skills and classifications from entry level to Professionals holding degrees.

The AMWU's purpose is to improve member's entitlements and conditions at work, including supporting wage increases, reasonable and social hours of work and protecting minimum award standards. In its history the union has campaigned for many employee entitlements that are now a feature of Australian workplaces, including occupational health and safety protections, annual leave, long service leave, paid public holidays, parental leave, penalty and overtime rates and loadings, and superannuation.

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Background

1. On 16 February 2015, the Australian Manufacturing Workers' Union (AMWU) notified the Fair Work Commission (FWC) that it intended to update the competency schedule (the competencies) in the Graphic Arts, Printing and Publishing Award 2010 (the Graphic Arts Award)

2. On 10 October 2016, the Fair Work Commission (FWC) issued a decision in relation to the technical and drafting issues arising form the group 2 exposure drafts[1]. It identified the AMWU's claim to amend Schedule concerning the competencies, opposed by the Australian Industry Group (AiG), as a substantive issue to be referred to a Full Bench for hearing and determination.

3. On 31 January 2017, the FWC issued directions for the matter to be heard before a Full Bench on 1 May 2017. The hearing was subsequently vacated. The Australian Industry Group (AiG) and the AMWU engaged in discussions regarding the update to the competencies schedule.

4. In September 2016 the AMWU provided a proposed competency package to the AiG. The Printing Industries Association of Australia (PIAA) were also involved in discussions.

5. Discussions continued over the course of the 2017. On 13 March 2018 the AMWU provided the AIG with further documentation detailing the proposed package ("comparison document").[2] The comparison document detailed which of the competencies in schedule C of the Award would be replaced and what the new proposed competency were.

6. On 23 April 2018 the FWC listed the matter for conference for a report back on the progress. Further discussions were held between the PIAA and the AMWU on 30

[1] [2016] FWCFB 7254
[2] https://www.fwc.gov.au/documents/sites/awardsmodernfouryr/am201633-corr-amwu-240318.pdf

May 2018. The PIAA support the AMWU's proposal to update the competencies in the Graphic Arts Award.

7. The AiG oppose the update and on 20 August 2018 the FWC issued directions requiring the AMWU to file an outline of submissions in support of the of claim to update the competencies.

8. These submissions will:
    a. Establish the legislative provisions and decisions relevant to varying the Graphic Arts Award;
    b. Review the history of the competency package and its relationship to the Award;
    c. Outline the reasons why competencies in the Graphic Arts Award should be updated; and
    d. Establish the necessity of the claim to maintain a fair and relevant safety net.

Legislative provision and decisions

9. The FWC has broad discretion under s156 of the *Fair Work Act 2009* (FWA) as to the conduct of the four yearly reviews of the modern awards. The FWC must ensure that the modern awards, together with National Employment Standards (NES) provide a fair and minim in safety net of terms and conditions, taking into account the modern award objectives set out in section (134)1 of the FWA.

10. Section 138 of the FWA goes to the importance of the modern award objectives by requiring the that the FWC be satisfied that modern award only include terms that are "necessary to achieve the modern award objectives."

11. The FWC needs to ensure a "stable" modern award system. This means that the party seeking to vary the modern award in the context of the award review present a merit based case supported by evidence and provide a historical context as to as to the facts as to why the variation is sought.

12. As stated in the decision of the Federal Court of Australia in *Construction, Forestry, Mining and Energy Union v Anglo American Metallurgical Coal Pty Ltd*[3] **,** the Commission's task in this review involves the "review of a modern award as a whole. That is " to review the award, and by reference to the matters in s134(1) and any other consideration consistent with the purposes of the objective, come to an evaluative judgement about the objective and what terms should be included only to the extent necessary to achieve the objective of a fair an minimum safety net." [4]

History of the competency package

13. The current competency schedule was inserted into the Award through the 2005 decision Graphic Arts- General- Award 2000 (the 2005 decision).[5] The AMWU's application involved the introduction of the eight-level classification structure which was linked to the appropriate wage rate. Progression through the classification structure was dependent on the "points system" through the employee satisfying competencies. Marsh SDP accepted the AMWU's claim to adopt the points system, and noted that there is "merit in adopting a mandatory role for the points system as part of the dispute settlement procedure when a disagreement or dispute arises over the classification of an employee."[6]Her honour also found that " there are sufficient checks and balances in the points system to ensure that the points system set out in the AMWU draft order will not be costly or onerous at the workplace level."[7]

14. The 2005 decision clearly encompassed for the competency standards to be periodically reviewed. Marsh SDP noted that the package is "*regularly reviewed such that the integration of the package with the classification structure would ensure*

[3] Construction, Forestry, Mining and Energy Union v Anglo American Metallurgical Coal Pty Ltd [2017] FCAFC 123

[4] Ibid at [29]
[5] PR964271.
[6] PR964271 at [254].
[7] PR964271 at [259].

that the structure remains a relevant tool for both employers and employees." (emphasis added).[8]

15. Indeed, the capacity of the competency package to be updated formed part of Marsh SDP's reasoning in finding that the points system "can provide flexible application at the enterprise level".[9] Her Honour referred to item 3 of Appendix F of the decision which said "any amendments made to the competency units in the Printing and Graphic Arts Industry Training Package (ICP05) after… will not apply as a term of this award without further award variation/s. Should such an application be made, all have the right to support or oppose the variation."[10] The ability of the competency package to be updated is a core requirement for the continuing flexibility of the industry.

16. It is important to emphasise that the 2005 decision reflected substantial agreement between the employer and union parties.[11] At the time, the AiG argued that the "points system should be used to resolve classification disputes because it enables the issues in dispute to be assessed with more precision than simply applying the wording in the classification definitions".[12]

The status of the Graphic Arts and Printing Industry

17. The printing and graphics industry employ roughly 35,7000 [13] as at 2015 and has undergone a significant transformation in the period since. Digitisation of large parts of the industry, along with an accelerating decline in traditional media as consumers move onto online and digital means that the industry is in a stage of transition.

[8] PR964271 at [25].
[9] PR964271 at [259 – point 1].

[10] PR964271, appendix F – Item 3.

[11] PR964271 at [78].
[12] PR964271 at [81].
[13] http://lmip.gov.au/default.aspx?LMIP/GainInsights/EmploymentProjections

18. PWC Skills Australia (PWCskills) is the current Skills Service Organisation (SSO) responsible for the vocational qualifications and training packages in the Print and Graphic Arts Sector. It provides analysis and advice to the Print and Graphic Arts Industry Reference Committees (IRC) about the skills and training needed in the industry, the trends shaping the sectors and what the future of the industry may evolve to in Australia.

19. The IRC comprises of 6 employer representatives including the PIAA, 1 TAFE and the AMWU, effectively covering the ambit of employer interests, training providers and workers in the industry.

20. As part of its consultative process and survey of the sector PWCskills undertook extensive surveys, open forums, interviews and focus groups to crystallize the trends and needs of the industry. In 2016 it conducted an Industry Voice Survey of 200 respondents as well as targeted surveys and focus groups. Further consultation of an additional 400 stakeholders for advice and input on training development projects was also undertaken.[14]

21. The following trends were identified by PWCskills Australia as having industry – wide implications:

    a. Market adjustment

    b. Reputation and work force transition;

    c. Customisation and multi-channel marketing; and

    d. Technological change.[15]

22. As print technology improves fewer workers are required to produce the same quantity of work. The transition from offset printing towards digital print technologies will impact the number of workers employed in the sector doing such

[14] PwC's Skills for Australia 4- Year work Plan Printing and Graphic Arts Version 2.0 8 Sept 2016, page 70
[i]bid page 23

work. [16]The employment projections in the industry reflect the impact of these trends, with jobs for printers, printing assistants, print finishers and screen printers, and graphic pre-press trade workers expected to have lower employment opportunities in the five-year period from 2015-19.

23. The drivers of these projections are ongoing technological improvements in the automation of the print industry, changes in the print technology mix and a shift towards non-traditional service offerings and new product contributions. [17]Consumers are also demanding improved access to the multiple channels for consuming media, such as newspapers, books and magazines in digitised formats. [18]

24. Beyond information media, the printing industry now includes the strategy, design and production associated with marketing material such as catalogues and brochures as well as packaging products such as labels, printed folding, corrugated flexible cartons. [19]

25. Demand for food products that require labelling and packaging is now driven by the demand for environmentally sustainable packaging. Packaging that incorporates QR codes to keep track of products is seen is "as food packaging revolution" and is projected to be a significant growth area for the industry. [20]

26. 3D printing is an evolution in the economy that is predicted to provide a key growth area in the industry and key factor that that most concerns employers as they look at avenues to grow.[21] The potential application of this area in the industry will traverse both traditional occupation roles, as well as leading to the growth of new types of jobs. Though the skills required for roles in 3D printing may be more comprehensive and specialised, the existing core competencies of workers in commercial printing and graphics continue to be a mainstay, albeit with the requirements that they may need different skills than in the past.

[16] Ibid page 17
[17] Ibid page 17
[18] Ibid page 24
[19] Ibid page 24
[20] Ibid page 25
[21] Ibid 33

27. The average age of the workers in the sector is over 38.9 years creating a tradition driven workforce. While these factors are identified by the IRC as a "ageing and static" workforce [22], it also means that these very workers are currently participating at the front line of the changing nature of the work.

28. It is in this context of seismic industry change and the hurdles faced by the workforce that the AMWU's claim must be considered. The shift in focus of the industry towards digital and customised products is a reality facing the industry. An updated competency package is necessary to address the evolutions that are emerging in the industry. The current form of the competency package in the Award does not accurately reflect the current practices, demands and day to day business of the industry now.

Changes in the Competency package

29. The initial training package was ICP99 which was released in 19 January 1999 by the Australian National Training Authority, approved in March 1999.[23]

30. In 2005 the Innovation and Business Skills Australia (IBSA) was the Industry Skills Council (ICC) authorised by the Australian Government to oversee and develop vocational education and training in the Print and Industry. IBSA periodically conducted industry reviews and assessed the skills and training necessary for training packages and subsequently released the next training package ICP05 1.0 in September 2005. These reviews involved extensive consultations across industry participants including employer groups, workers representatives and training organisations.

31. It was from this training package that the union and employer parties selected the competencies from the ICP05 training package to be inserted into the package in the 2005 Decision referred to above.

[22] Ibid page 27

[23] https://training.gov.au/TrainingComponentFiles/NTIS/ICP99_1.pdf

32. The training packages developed by IBSA provided the basis for maintaining and developing AQF national qualifications which feed into the eight classification levels under the award.

33. Since that that time the skill package has gone through 6 iterations.

2007	ICP05 v2.0
2009	ICP10 v.1.0
2012	ICP10 v2.0
2013	ICP10 2.1
26 March 2015	ICP v.1.0
9 April 2015	ICP v.1.1
15 January 2016	ICP v2.0 (current version)

34. ICP05 v2.0 was released in 2007.[24] In 2009 IBSA released ICP10 v.1.0 which included additional digital printing units of competency and units related to environmentally sustainable work practices. Further modifications of the training packages were conducted in July 2012 and April 2013, ICP10 v.2.0 and ICP10 2.1 respectively. [25]

35. The review of the CIP10 v2.1 resulted in a decrease in the number of qualifications in the training package from 34 to 16 points. The training package contained one new skill set to address digital literacy, 288 native units of Competency and 164 imported

[24] https://training.gov.au/TrainingComponentFiles/NTIS/ICP05_1.pdf
[25] https://training.gov.au/TrainingComponentFiles/ICP10/ICP10_Header_R2.0.pdf

units. This review resulted in a streamlining of the 16 qualifications into the 8 qualifications.

36. A consistent theme in the updates is the emergence of the digital skills as a core requirement. Despite the numerous reviews of the training package since 2005, the competencies and classifications schedule under the Award still rely on the ICP 05 training package, which was approved in 2005. It cannot be relevant to the modern award or to the needs of the sector.

Necessity of the claim

37. For employees without a formal qualification, the competency schedule provides a means by which classification can occur. The competency schedule also serves as a dispute resolution function in the event of and disagreement between the employer and employee about the classification.

38. It is necessary to emphasise that the outdated competency schedule in the award is incompatible with the requirement of a "relevant safety net" – the two are diametrically opposed. It is difficult to reconcile the ICOP05 as fulfilling the objectives of a "minimum safety net" when many of the competency units have been updated and replaced and are no longer operative.

39. The print, packaging, visual communication and media technology industries are in a state of transition and change. Although there has been a downward trend in the traditional industry areas, workers in this sector make up one of the largest manufacturing sectors in Australia, employing 110,000 people in 5,8000 business. [26]

40. The importance of the having updated schedule is based primarily to settle any disputes that may arise as to the classification of the worker. The points system is to be used to determine the capabilities of the worker in the job, doing the job. The process of assessment can only assess what the workers is performing for the requirements of the job. It does not superimpose skills from the training package simply because they appear in the training package.

[26] 1 IBISWorld, Industry Report C1611 Printing in Australia September 2016

41. This may result in some re classification however this is not the job that the schedule of competencies must do. Classification or reclassification can also occur using the indicative tasks method in the Classification schedule of the Award.

42. For a point of comparison, support competencies such as “train small groups”, “plan and promote a training program” and “plan a series of training sessions” all appear in the support competencies of the Award. There is no suggestion that said competencies are expanding the domain of coverage of Award by reimagining the classifications. To the extent that it would, clause 4 of the Schedule provides enough protection and refers relevant coverage matters back to clause 4 of the Award.

43. Clause 23.4 of the Award states:

*2**3.4 Classification of employees without a formal AQF qualification***

(a) Subject to this clause, employees will be classified, as determined by the employer, on the following basis:

(i) that they meet the requirements of the classification definitions in Schedule B—Classification Definitions; or
(ii) that they meet the points requirements set out in Table A of clause 17— Wage rates and classification structure and Schedule C—Competencies.

(b) Should there be any disagreement in relation to classification or reclassification, the method in clause 23.4(a)(ii) will be used in accordance with clause 23.6.

(c) Only skills and knowledge which are being used in accordance with the needs of the enterprise will be taken into account for classification purposes

43. This Clause means that only the relevant skills for the occupation being performed will be considered for classification – by implication skills and knowledge outside the needs of the enterprise will not be considered. An occupation would have to fall within the coverage scope of the Award prior to an employee being classified in accordance to clause 23.4. If an employee was performing tasks outside of the Award, then clause 23.4 would have no application and the competencies schedule would therefore not apply.

44. In the situation where a worker is performing work that does not have a correlating competency in the schedule, the classification method is ineffective and fails.

Similarly, work that is done that are covered by three competencies in the schedule have no value when they do not exist in the training schedule. For example, a worker utilising skills on a digital press is not captured in the units of competency currently in the schedule.

45. The table below shows the recent changes to the ICP training package. The removal of the units of competency deal with qualifications have been removed or updated. It underlines the fact that the there are units of competencies that remain the schedule are irrelevant and not fit for purpose.

Recent changes to the ICP Training Package [27]

	Added	Undated	Removed
Qualification	**Three qualifications were added** 1. Certificate III in Printing 2. Certificate III in [illegible]nt Manufacturing 3. Certificate III in Print Communications	**Five qualifications were updated** 1. Certificate II in Printing and Graphic Arts (General) 2. Certificate IV in Printing Graphic Arts 3. Certificate IV in Printing and Graphic Arts (Mail House) 4. Certificate IV in ePublishing 5. Diploma of Printing and Graphic Arts	**Eleven qualifications were removed** These qualifications were all specialised versions of the Certificate III in printing and Graphic Arts, in the following areas; Graphic Design Production; Graphic Prepress; Multimedia; Digital Printing; Printing; Screen Printing; Print Finishing; Sacks and Bags; Cartons and Corrugating; Mail House; and Ink Manufacture.
Skill sets	**Three skill sets were added** 1. 3D Print [illegible]ndamentals 2. Digital Colour 3. Advanced Digital Colour	**No skill sets were updated**	**No skill sets were removed**
Units of competency	**Four UoCs were added** 1. Develop knowledge of the printing and graphic arts industry 2. Set up and produce 3D print 3. Set up and produce 3D	**Nine UoCs were updated** 1. Set up and produce hand-bound book 2. Create an extensible document 3. Create an extensible style sheet 4. Set up for basic flexographic printing 5. Use colour management for production	**Eleven UoCs were removed** These UoCs were all versions of 'apply knowledge and requirements' of each of the sub-sectors that had specialised qualifications that were removed (as above).

[27] PwCskills Australia – Industry Skills Forecast and Proposed Schedule of Work Printing and Graphic Arts Version 2.0 – 24 April 2017 https://s3-ap-southeast-2.amazonaws.com/pwcau.prod.s4aprod.assets/wp-content/uploads/20170718142658/20170428-Education-Industry-Skills-Forecast-and-Proposed-Schedule-of-Work-2.1.pdf [66]

	scan 4. Manipulate 3D graphics files in preparation for 3D printing	6. Produce PDF files for online or screen display 7. Develop a detailed design concept 8. Create pages using a page layout application 9. Prepare stencil using photographic capillary method	

46. The updated competency package is necessary to address the skill gaps that are emerging in the industry that were identified by the IRC and detailed in the *Industry Skills Forecast and Proposed Schedule of Work Printing and Graphic Arts*" April 2018 report by PWCskills Australia[28].

47. The report tracks the growing shift towards customised service that expands beyond what was traditionally printing and graphic arts. Workers in the core work of printing and graphic arts are required to understand the diversified nature of the businesses in which they now operate and build and use skills accordingly.

48. The redistribution of traditional print media to other printing services means the skills required for workers will be those that allow them to be able to move between different kinds of printing and associated technologies.[29] A worker in the industry will require high level of technical skills to sit alongside production and supply skills. The shift towards digital printing technology is changing the skills required to operate equipment.[30] It has reduced the number of hours necessary for print runs resulting in fewer technical staff directly involved in printing and a larger proportion of the time worked being involved in customer service.

49. In addition, digital communication and 3D printing is expected to have ongoing transformative impact on all sectors of the industry. There is a cross pollination of the work done across activities in the sector and workers will be required to utilise

[28] https://s3-ap-southeast-2.amazonaws.com/pwcau.prod.s4aprod.assets/wp-content/uploads/20180911160039/ICP-Industry-Skills-Forecast-2018-.pdf
[29] Ibid page 23
[30] Ibid page 33

skills that are focused on customer facing functions as well as understanding and using new printing technologies.

50. The ongoing evolution of the training package is a barometer of the changing face of the industry and the type of skills that workers at the shop level are utilising on day to day basis. The proposed competency package is not just about printing and graphic arts workforce taking on new roles but about doing their existing roles better and organic upskilling that flows from the adaptations of the industry.

51. It is not the case that an updated competency schedule would ameliorate all of the challenges within the industry. Rather, it would ensure that an outdated schedule does not contribute to the problems in the industry.

52. Printers may not necessarily be expected to become data analysts or managers but an understanding of the broad sector is becoming a necessity. The skills and the day to day work of the workforce will pay a vital role in supporting this transition. Whatever the progress of the industry may unfold, the core service of printing is likely to remain a mainstay of the sector.Businesses are adapting to survive and so are the workers that they employ.

The modern award objectives

53. As to the specific requirements in section 134(1) to (h), the AMWU submits as follows.

Section 134(1)(a)- needs of the low paid

54. The Annual Wage review 2015-2016 addressed the issue of what constituted the low paid. [31] The Exert panel noted "broad acceptance of the proposition that the two thirds of median (adult) ordinary time earnings constitutes a reasonable basis for identifying the low paid".

[31] [2016] FWCFB 3500

55. Workers in this sector such as binders, finishers, screen printers, graphic trade pre-press trade workers, printers and table workers tend to earn less than the economy average of $1231 a week.[32]

56. Wages will be able to be better aligned with relevant classification, providing better protection to workers and clarity to employers. An updated schedule in the award will ensure a relevant tool for the protection of workers in the sector.

Section 134(1)(b) – need to courage collective bargaining

57. This is a neutral consideration.

Section 134(1) c – the need to promote social inclusion

58. In the annual wage review of 2015-2016 the FWC expressed the view that social inclusion is taken to mean increased employment. [33] The intensive survey of the sector conducted by PWC Skills and as noted above is that the consensus in the industry is that an older workforce and the prevalence of small business makes it difficult for workers to progress and does not create space for new workers to enter the workforce[34].

59. An updated competency schedule that is better tailored to the work being done, and the skills utilised will allow workers to remain motivated as to the relevance of the skills they are gaining and employers to retain capable workers.

60. Employers have identified a strong need to diversify the workforce and attract younger people into training to fill the gaps in skills needed. With a prevalence of small businesses who are looking to stay relevant in the changing industry, an out of date competency schedule in Award will only inhibit workers already employed form gaining the skills they need. The work will be less attractive to younger potential employees who may consider the work practices outdated.

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[32] Australian Bureau of Statistics (2016) Employee Earnings and Hours, Australia, May 2016, cat. no. 6306.0, latest update as of 25/02/2018

[33] [2016] FWCFB 3500 [68]

[34] https://s3-ap-southeast-2.amazonaws.com/pwcau.prod.s4aprod.assets/wp-content/uploads/20180911160039/ICP-Industry-Skills-Forecast-2018-.pdf at 17

S134(1)(d) – need to promote flexible modern work practices and the efficient performance of work.

61. For employees without a formal qualification, the competency schedule provides a means by which classification can occur. The competency schedule also serves as a dispute resolution function in the event of an disagreement between the employer and employee about the classification.

62. The inclusion of a contemporary and relevant competency schedule goes to the heart of the need to promote efficiency in the workplace. As stated above, there is overwhelming evidence that the print and graphics sector is undergoing a transformative period, indicated by technological change, market forces, changing consumer demands and changes in the workforce.

63. There is no doubt that all participants are cognisant of the acute needs in the industry to work differently, broaden and understand changing skills whether they are workers, employers or training providers. As these changes flow through, the Award must reflect the work practices as they are performed. Not doing so runs the risk that the skills gaps that emerge will not be addressed and workers will not be able to match their skills to current competencies, leading to inefficiency and stagnation.

64. The updated schedule will improve options for upskilling of employees and better recognition of their classifications and abilities as they will be able to better map the work that they do. Clearly defined methods to determine the classifications and correlating qualifications will add to the attractiveness of the jobs in the prints and graphics sectors. This is especially important when the overriding concern of employers is the emerging skills gap as noted in the extensive industry scans conducted by PWCskills.

Section 134(1)(e) – the need to provide additional remuneration

65. This is not a relevant consideration in the present matter.

Section 134(1)(f) – equal renumeration for work of equal or comparable value.

66. This is not a relevant consideration in the present matter.

Section 134(1(g) – likely impact on productivity, employment costs and regulatory burden.

67. Given the fact the Award has operated for over a decade with the inclusion of the competencies schedule, the inclusion of an updated schedule would not result in additional burden on the employer. Rather an updated schedule would result in greater convenience and efficiency of the enterprise as there would be no need for the employer to search for the most updated competencies- they would already be captured in the Award.

Section 134(1)(h)- the need to ensure a simple easy to understand stable and sustainable modern award system.

68. The constant updating of the training regimes and qualifications that dictate the sector has led to a feast of information about competencies and training requirements. An updated schedule of the relevant competencies for the sector provides a go to reference point for workers and employers, particularly for those workers without a formal qualification who are seeking clarity.

Section 134 (1(i) – likely impact on any exercise of modern award powers on employment growth.

69. There is no evidence that the exercise of the modern award powers in this matter will have any adverse impact on employment growth, inflation and the sustainability, performance and competitiveness of the national economy.

Conclusion

1. The AMWU submits that the current competency package in the award is outdated and largely irrelevant due to the transformation of the training package that initiated it.

2. That the digitisation of the industry and the multi-faceted evolution of the industry over the past ten years has been cause for a change in the work that workers do. The competency package should accordingly be updated to capture the skills and

competencies that are now prevalent in the industry and remove those that are obsolete.

3. That the update of the schedule is a permitted matter within the statutory framework of the modern awards and the variation sought is necessary to establish a minimum safety net.

END

4-Year Work Plan
Printing and Graphic Arts

Version 2.0 – 29 September 2016

Printing and Graphic Arts

4-Year Work Plan

September 2016

pwc

29/09/2016

4-Year Work Plan

The 4-Year Work Plan presented here sets out the training product development priorities for the Printing and Graphic Arts Industry Reference Committee (IRC) through to June 2020. It is based on research, analysis and consultations with IRC members and other stakeholders. It also includes actions to conclude proposed changes to the Training Package that began under the previous Industry Skills Council (ISC).

Additionally, we have responded to the presentation made by Professor John Pollaers, Chair of the Australian Industry and Skills Committee (AISC), at the IRC Chairs meeting on 26th August 2016. In particular:

- **Advice about the level of industry support.** Where possible in this Work Plan, we have given an indication of the level of industry support and consultation done, including which stakeholder groups have been consulted and what specific feedback has been given.

- **Consideration of the best use of available resources.** We recognise that the Australian Government has limited resources. In this Work Plan, training product development projects have been prioritised so as to direct resources to areas of greatest need and where training product development can have the greatest positive impact.

- **Reform directions announced by Ministers in November 2015.** In the analysis and the development of training product development priorities in this 4-Year Work Plan, we have been cognisant of the reform directions announced by Ministers on the 14th of November 2015 as part of the communique for the Council of Australian Governments (COAG) Industry and Skills Council.

- **Creative thinking about how and when changes are made to the training package to meet industry needs.** In our extensive consultations with IRC members, we have encouraged members to think creatively about the ways which the Printing and Graphic Arts Training Package can best meet industry needs.

This 4-Year Work Plan has been prepared by PwC's Skills for Australia and the Printing and Graphic Arts IRC.

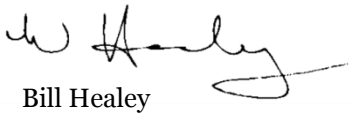
Yours sincerely,

Sara Caplan

CEO

PwC's Skills for Australia

www.skillsforaustralia.com



Bill Healey

Chair

Printing and Graphic Arts IRC

Executive summary

In developing this Work Plan, PwC's Skills for Australia and the Printing and Graphic Arts IRC aim to refocus the discussion of skills and training to ensure that training design is centred on what will equip learners with the right knowledge and skills to pursue fulfilling careers. This requires setting a clear narrative from sector trends, to skills needs, and through to specific training requirements. To do this requires three key elements (as reflected in the structure of this Work Plan):

- **Understanding the sector** *(Sector overview)* – What activities make up the sector that training products are being designed for? What are the sub-sectors within the broader sector and how different or similar are they? Who are the employers and where are they located? Who is undertaking training in the sector and where is that training being undertaken?

- **Understanding the trends shaping the sector and the skills priorities they lead to** *(Skills outlook*) – What is impacting on the sector? From how global trends in demographics and digital change are impacting on activities in the sector; how domestic economic conditions are influencing growth; to sector specific trends. How do these trends influence skills needs within the sector? What are employers telling us about their engagement with VET (vocational education and training) and the skills acquired by learners?

- **Implications for training** *(Training Product Review Plan)* – What does the current Training Package look like and does it align with the trends and skills priorities identified? Are there any gaps and what needs to change? How should these training products be reviewed?

The views of businesses, learners and other stakeholders in the printing and graphic arts sector are critical to understanding of skills needs in the workforce and therefore the approach to training product review.

What is the printing and graphic arts sector?

The printing and graphic arts sector includes workers in Australia with skills that help organisations to communicate messages effectively through a range of media as well as assisting creative industries to deliver their products. Technological disruption and global industry trends have created a rapidly changing environment that requires changes to the industry skills profile.

What are employers telling us?

Initial consultation with employers in the industry and IRC members showed two key messages:

- **Resources need to be directed to training.** Many employers in the printing and graphic arts sector have struggled to realise profit growth over the past decade, inhibiting their ability to invest in recruitment and professional development of staff. This has resulted in a need for greater emphasis on staff development to give workers the right mix of new and traditional skills.

- **Printing is an evolving industry.** The sector is adapting to emerging print technologies and customisation of products and services. Training can play an important role in ensuring employers have workers with appropriate technical and 'soft' skills to capitalise on technological change as well as address skills gaps as the sector adapts, particularly as much of the industry is characterised by a static and ageing workforce.

What are learners telling us?

Drawing from existing survey data, there appear to be two main findings for recent graduates six months after completion of a printing and graphic arts qualification:

- **Employment prospects are better than average.** 82 per cent of Printing and Graphic Arts graduates were employed within six months compared to 74 per cent across the VET sector.[1]

- **Earnings are lower than average.** Recent Printing and Graphic Arts Training Package graduates earned an average of $50,500 per annum, compared to $56,900 across the VET sector.[2]

Trends shaping the sector

Industry feedback, combined with research and analysis, indicates that the following trends will be shaping current and future skills needs.

1. Market adjustment

As relayed by the Printing & Graphic Arts IRC, there is a perception that the printing and graphic arts sector is in decline, based on the performance of some products, particularly print media. However, as challenged by the IRC, the printing and graphic arts sector does not just generate print media and there are still areas of potential growth such as customised direct mail advertising, food labelling and packaging, and other consumer goods. The overall outlook may be more a story of redistribution, between different sub-sectors of products and in the types of firms in the sector, rather than one of overall decline.

2. Reputation and workforce transition

A challenge for the printing and graphic arts sector is attracting talent and maintaining a motivated and capable workforce. Based on consultation with the Printing & Graphic Arts IRC and our own research and analysis, this appears to be stemming from three core issues: perception and reputation of the sector; working conditions and prospects; and in many cases, an ageing and static workforce. Combined, these issues mean that new talent and skills are not entering the industry at a rate that might otherwise be expected. It is therefore important that new workers are being trained in the critical and creative thinking skills that will help bring fresh perspectives to the sector.

3. Customisation and multi-channel marketing

In response to market adjustments, industry participants are expanding into non-traditional service offerings, such as data driven customisation and multi-channel marketing. New service offerings and a shift toward greater consumer focus means that organisations which traditionally sat in the printing and graphic arts sector now employ a greater proportion of non-printing roles. However, they are likely to retain printing as a core service offering and will therefore still employ workers in core printing and design occupations. These printing and design workers will need to understand the more diversified businesses in which they sit and their alignment to the organisation.

4. Technological change

The printing and graphic arts sector is heavily reliant upon printing hardware and software, both of which are continuing to change rapidly. These technological changes are continuing to alter the roles in which people work and the service offerings of the industry. These changes include: a shift in printing technology from offset to inkjet and digital; on demand printing; 3D printing and other emerging technologies such as vinyl wrap

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[1] National Centre for Vocational Education Research (2015) *Government-funded student outcomes, VET students by Training Package*

[2] National Centre for Vocational Education Research (2015) *Government-funded student outcomes, VET students by Training Package*

printing, glass and metal printing, display boards and materials, radio frequency identification (RFID) embedded printed product, localised custom web printing.[3]

Skills priorities

To enable a flexible and skilled workforce and adapt to the trends shaping the sector, the Printing & Graphic Arts IRC has identified the following skills priorities.

1. Industry awareness

Different parts of the sector are contracting, growing or transforming in response to external forces. An understanding of the broad industry and trends, as well as the ability to research and analyse new information will allow workers to keep up to date with movements. Increased awareness industry changes and conditions by workers is likely to lead to adaptability and sustainability of the industry itself.

2. Career and development planning.

This is an ability to plan one's own career (or own business) in a changing industry environment by self-assessing skills and planning development and progression. For entry level workers this is the ability to assess and find the best place for themselves in the market. At higher levels it may be about creating that market for the service they can provide.

3. Creative, commercial and critical thinking

With low turnover of staff and ideas, a skills gap is emerging in how to confidently pursue new options through testing and implementation. Consultations with Printing & Graphic Arts IRC members have revealed that many workers in the sector may not have sufficient creative problem solving skills to recognise problems and conduct root-cause analysis. However, it is also recognised that this may not be the case for all subsectors within the printing and graphic arts industry.

4. Collaboration and relationship building

This is the ability to build working relationships and collaborate within an organisation that may be broad ranging in its service offerings and requires different parts of the business to work together. This includes communication techniques for identifying and working with different personalities.

5. Agility and flexibility

Technology is changing the way that printing and graphic arts services are delivered. The industry composition of what those services are is also adapting with some sub-sectors contracting and others innovating in to new spaces. Structural change in the sector means that printing and graphic arts graduates will need adaptability and flexibility skills, to respond to change and embrace new roles and technologies.

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3 Discussed with IRC members at formal SSO and IRC meeting, August 2016.

Training Product Review Plan

Our mandate as a Skills Service Organisation (SSO) to our IRCs, as set by the Australian Industry and Skills Committee (AISC), is to review all units of competency (UoCs) in the Printing & Graphic Arts (ICP) Training Package within the four years from 2016-17 to 2019-20. Therefore, the Training Product Review Plan in this Work Plan presents projects anticipated to be conducted through to June 2020 which will review all these UoCs. The SSO and IRC drew on the above analysis of trends and skills to determine Training Package development priorities. There are two types of projects in this Training Product Review Plan:

- **Training product development (TPD)** projects encompass a review of UoC content and are undertaken for the explicit purpose of creating or updating training products to provide for outcomes which meet the needs of industry. These reviews may include amendments to, or consolidation of, current UoCs and/or the creation of new UoCs

- **Business case activities (BCA).** Where there is not enough current information to determine the discreet nature of the training product development work, but where the IRC identifies subject matter that needs to be examined, this kind of activity has been termed business case activity.

A summary of all projects in the Training Product Review Plan is shown in Table 1. The rationale and further detail for each project, as well as the principles used for prioritisation and scheduling are included with the full Training Product Review Plan in Section F of this Work Plan.

Table 1: Summary Training Product Review Plan

Year	Project type	Status	Project code	Project name	Number of UoCs		
					Native	Imported	Total
2016-17	BCA	IRC to submit business case in year 1	2a	Establishing a competency framework by reviewing the structure of higher level qualifications	N/A	N/A	N/A
2016-17	BCA	IRC to submit business case in year 1	2b	Investigate the broader industry needs for 3D printing	N/A	N/A	N/A
Total UoCs planned to be reviewed in year 1					**N/A**	**N/A**	**N/A**
2017-18	TPD	Not yet submitted	1a	Review 3D printing units and skill set	3	4	7
2017-18	TPD	Not yet submitted	1b	Review UoCs related to industry knowledge and priority employability skills	32	56	88
Total UoCs planned to be reviewed in year 2					**35**	**60**	**95**
2018-19	TPD	Not yet submitted	1c	Review design, marketing and other pre-press technical UoCs	66	101	167
Total UoCs planned to be reviewed in year 3					**66**	**101**	**167**
2019-20	TPD	Not yet submitted	1d	Review print and post-press technical UoCs	180	5	185
Total UoCs planned to be reviewed in year 4					**180**	**5**	**185**
Total UoCs planned to be reviewed in all years					**281**	**166**	**447**

Table of contents

A. Administrative information

About PwC's Skills for Australia

PwC's Skills for Australia supports the Printing and Graphic Arts Industry Reference Committee (IRC).

As a Skills Service Organisation (SSO), PwC's Skills for Australia is responsible for working with industry and our IRC to:

- Research what skills are needed in our industries and businesses, both now and in the future, to provide the right skills to match our job needs; helping us to stay at the forefront of global competitiveness and support continued economic prosperity.
- Identify and understand current and emerging trends in the global and domestic economy and how they impact on Australia's skills needs.

Revise our vocational qualifications and training content to better match what people will learn with the skills needs of our industries and businesses, giving our population the best possible chance of developing work ready skills.

About the Industry Reference Committee

The Printing and Graphic Arts Industry Reference Committee includes **9** members:

Name	Organisation	Title	IRC role
Bill Healey	Printing Industries Association of Australia (PIAA)	Former CEO	IRC Chair
Lorraine Cassin	Australian Manufacturing Workers Union (AMWU) Print	National Secretary – AMWU Print Division	IRC Deputy Chair
Kerim El Gabaili	OnePoint	CEO	IRC Member
Julie Hobbs	Future Now	CEO	IRC Member
Marcus Hooke	News Corp Australia	National Director - Production	IRC Member
Peter Lane	Lane Print Group	Managing Director	IRC Member
Michelle Lees	Printing Industries Association of Australia (PIAA)	National Project Consultant	IRC Member
Brett Maishman	Fuji Xerox	National Industry Manager	IRC Member
Andrew Macaulay	Printing Industries Association of Australia (PIAA)	CEO	IRC Member

B. Sector overview

The sector at a glance

The printing and graphic arts sector includes workers in Australia with skills that help organisations to communicate messages effectively through a range of media as well as assisting creative industries to deliver their products. Technological disruption and global industry trends have created a rapidly changing environment that requires changes to the industry skills profile.

The Printing and Graphic Arts (ICP) Training Package has eight qualifications from Certificate II to Diploma, with a focus on the Certificate III level. More detail of the ICP Training Package, including an overview of enrolment levels, is included after the sub-sector descriptions and state by state overview.

Sub-sector descriptions

The ICP Training Package, unlike other Training Packages, serves a limited and relatively defined workforce (as opposed to having many sub-sectors). The ICP Training Package prepares learners to enter two general occupations: printer and pre-print graphic artist. Due to the generalist nature and limited number of qualifications in the Training Package, each qualification cannot be said to be leading to a single specific occupation, but rather all the qualifications can be used to prepare for either occupation (which may be at different levels of seniority or responsibility).

Therefore, sub-sectors are not particularly relevant in this sector. However, these occupations have traditionally had a variety of specialisation areas, which is at the individual level and these individuals may work together in the same organisation or separately, but still fall in the same sector of creating printed products for clients. Specialisation areas have historically included:

- cardboards, cartons and corrugations
- converting binding and finishing
- desktop publishing
- digital printing
- digital production
- graphic pre-press
- ink manufacture
- mail house
- multi-channel communications
- multimedia
- print finishing
- print production support
- printing
- process improvement
- sacks and bags
- screen printing.

Anecdotal evidence from IRC members suggests that increasingly the printing and graphic arts workers are working within multi-disciplinary communications teams. In these teams, printing and graphic arts workers are doing a broad range of activities such as developing marketing strategies, designing marketing materials for print and online distribution as well as working closely with workers from other related fields such as ICT and advertising.

State by state overview

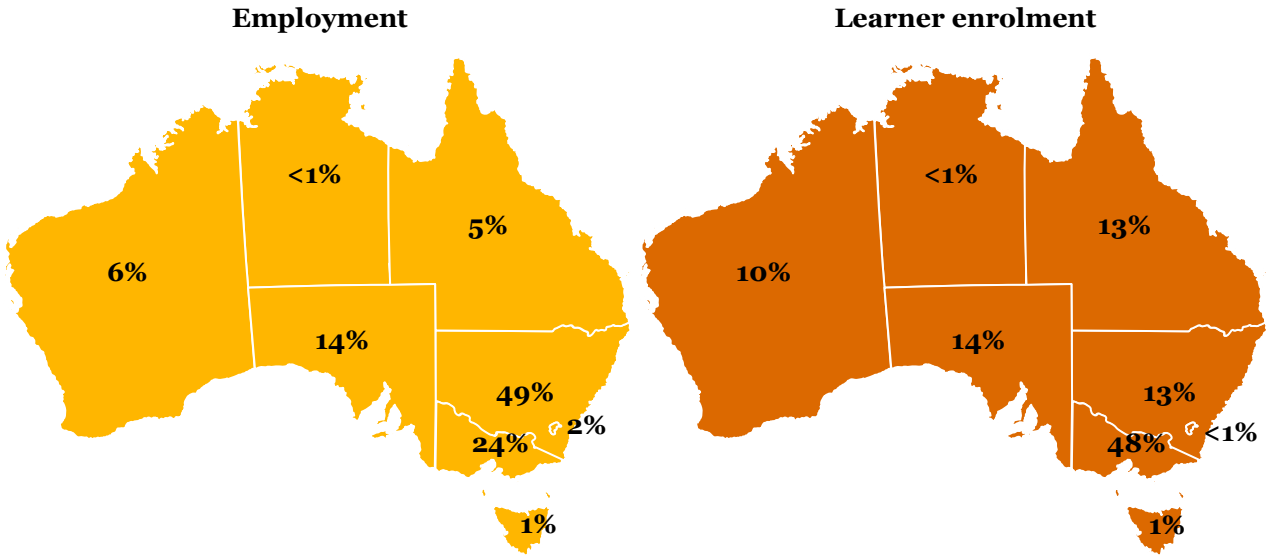
In developing printing and graphic arts training, ensuring a direct linkage from a learner's training to their employment in the sector is important. One of the factors influencing the strength of these linkages is the geographical distribution of learners and their employers, with learners ideally located in the same region as their employers. Key differentiating factors between the states and territories include:

- **Business clustering.** Similar businesses tend to co-locate in certain geographical areas or states. By co-locating, businesses may be able to improve their operating efficiency, leveraging existing networks, related businesses and inter-personal connections between workers.

- **Economic drivers.** The economic drivers within a state or territory shape the composition of sectors and employment. Given this influence, it is unsurprising that the number of workers and learners differ on a state and territory basis, and may have a higher/lower representation comparative to the population.

Figure 1 below shows the current geographical distribution of domestic learners enrolled in printing and graphic arts training, alongside the distribution of employment in typical printing and graphic arts occupations.

Figure 1: Geographic spread of workers and learners



Note: Excludes all enrolments in Certificate II, as that qualification is primarily used as VET in Schools training and is not seen as directly leading to occupational outcomes. The printing and graphic arts sector has been defined by 6 unit level (4 digit) ANZCO occupations. This definition has been based upon ANZSCO qualification classifications, taxonomy mapping and occupational outcomes of ICP qualifications. N.B Employment in the printing and graphic arts sector cannot be directly defined by the ANZSCO classification of qualifications these are at the 6 digit ANZSCO level but state-by-state employment data is only available at 4 digit level.
Source: ABS (May 2016) *Labour Force, Australia, Detailed, Quarterly*, cat. no. 6291.0.55.003, NCVER (2015*) Total VET Activity 2014*

Differences between the states and territories in the printing and graphic arts sector, and key drivers of these differences, include the following[4]:

- **New South Wales** makes up approximately half the employment in the sector. This clearly shows a clustering of the sector in the state, as it is well above the 32 per cent which is the state's contribution to national employment in all industries. However, the enrolments in the state are noticeably much lower. This may be due to the static workforce (see Section D) meaning that despite high employment levels

[4] ABS (May 2016) Labour Force, Australia, Detailed, Quarterly, cat. no. 6291.0.55.003, NCVER (2015) Total VET Activity 2014

there are not openings for new graduates to join. Alternatively, it could indicate a future undersupply of graduates or approaching reduction in employment in the state's printing and graphic arts sector.

- **Victoria** has the next highest level of employment at 24 per cent, similar to the state's proportion of national employment in all industries. However, Victoria has a significantly higher proportion of learner enrolments, above what would be expected from population or employment in the sector, suggesting potential oversupply of graduates or potential future growth of the state's printing and graphic arts sector. Although anecdotal evidence from the Printing & Graphic Arts IRC suggests that the high proportion of learner enrolments is as a result of a high number of apprentices and traineeships with Visy, a packaging company based in Victoria.

- **South Australia** has relatively high employment in the sector compared to its population. South Australia has 14 per cent of the printing and graphic arts sector employment, compared to 7 per cent of national employment in all industries, showing that the state does have a clustering of employment in the sector. Learner enrolments are in line with the state's level of employment in the sector.

- **Queensland** has only 5 per cent of printing and graphic arts sector employment, despite having 20 per cent of national employment in all industries. This is likely due to the clustering of employment in New South Wales (and to a lesser extent in Victoria and South Australia). However, Queensland has a noticeably higher proportion of enrolments (though still below the spread expected with population). This suggests some potential oversupply of graduates or potential future growth of the state's sector.

- **Western Australia** has only 6 per cent of printing and graphic arts sector employment, despite having 11 per cent of national employment in all industries. This is likely due to the clustering of employment in New South Wales (and to a lesser extent in Victoria and South Australia). However, Western Australia has a somewhat higher proportion of enrolments (though still below the spread expected with population). This suggests some potential oversupply of graduates or potential future growth of the state's sector.

- **Tasmania** has a small level of employment and learners in the sector, but this is broadly aligned with the population and proportion of national employment in all industries.

- **Northern Territory**, at the level of data available, has no recordable employment or enrolments in the sector. It is likely that having no large employers also means that there are no RTOs delivering ICP training in the territory.

- **Australian Capital Territory** has a small level of employment and learners in the sector, but this is broadly aligned with the population and proportion of national employment in all industries.

Given that a large proportion of the printing and graphic arts sector heavily utilises an apprentice based training model, it is likely to be more difficult for learners to move between states (as a new employer supporting their apprentice would need to be found and enrolment in training transferred to a new provider). As such, problems in the geographical mismatch of employers and learners may persist and cause issues in the sector as workers are unlikely to be highly mobile. However, it is recognised that there are a small number of learners enrolled in ICP training and learner enrolment data presented in Figure 1 may be volatile from year to year.

Printing and Graphic Arts Training Package profile

There are eight qualifications in the ICP Training Package (see Table 2). Of the 3.9 million vocational education and training learners enrolled in 2014, 3,500 were enrolled in the Printing and Graphic Arts Training Package.[5]

Table 2: Scale of qualification involvement

Qualifications	RTOs with scope (April 2016)	Enrolments (2014)	Completions (2014)
Certificate II in Printing and Graphic Arts (General)	26	446	63
Certificate III in Print Manufacturing	9	828	110
Certificate III in Print Communications	16	401	114
Certificate III in Printing	10	1,129	266
Certificate IV in Printing and Graphic Arts (Mail House)	1	N/A	N/A
Certificate IV in ePublishing	0	N/A	N/A
Certificate IV in Printing and Graphic Arts	10	17	13
Diploma of Printing and Graphic Arts	7	83	23

Source: National Centre for Vocational Education Research (2014) *Total VET activty, enrolments & completions*; Training.gov.au (2016) *RTO Scope Search Reports*
Note: enrolments and completions numbers are taken from 2014 data before Training Package consolidation and therefore had to be translated to equivalent qualifications

IRC feedback has indicated that up to 80 per cent of learners are enrolled through a single RTO. The effect on learner outcomes of this training density has not been investigated, however, as so few RTOs conducting training for the sector, change should be approached carefully, so as not to discourage existing RTOs from continuing to offer training.

Licencing, regulatory or industry standards issues

In some industries, VET is used to facilitate the completion of compulsory training to obtain a licence or meet certain regulatory requirements. In these cases, particular UoCs will be designed to make sure the individual gains the knowledge to satisfy these requirements.

In the printing and graphic arts sector, occupations are not individually licenced or regulated, with any legislation or standards being imposed at the organisational level instead. Therefore, UoCs are not designed to meet requirements at the individual or occupation level. Despite this, training is still designed to make learners aware of regulatory requirements that are imposed on their industry and enable workers to assist in ensuring that their organisation is meeting its obligations.

Regulation that workers in the printing and graphic arts sector need to be generally aware of include:

- **Copyright**. Employees (particularly in design) will need to be aware of obligations and ensure that their work and the work of their organisation complies with copyright standards. Learners can choose to undertake 'BSBIPR401 Use and respect copyright', but general compliance is included as a knowledge outcome in over twenty other UoCs in the ICP Training Package.

- **Waste disposal.** Some printing processes can lead to the production of liquid and other waste that must be disposed of in accordance with regulatory requirements or industry best practice. Learners can choose to undertake 'ICPSUP323 Dispose of waste' and over fifty UoCs that teach specific printing competencies have knowledge outcomes of disposing of the waste in line with regulatory requirements.

5 National Centre for Vocational Education Research (2015) *Students and courses 2014*

- **Work health and safety.** Due to there being no specific work health and safety licencing requirements, there are no specific units in the ICP training package. However, understanding work health and safety requirements of using certain equipment or being in certain environments is included in a range of UoCs in this training package.

Challenges and opportunities

The views of businesses, learners and other key stakeholder in the printing and graphic arts industries are critical to understanding the skills needs in the workforce. The approach to training product review planning in this Work Plan is centred on this feedback and their views of the challenges and opportunities in their sector and organisations. Table 3 identifies some of the key stakeholders relevant to vocational education and training and the printing and graphic arts sector.

Table 3: Stakeholders in the printing and graphic arts sector

Stakeholder groups	Key stakeholders
Training Product Development	• Australian Industry and Skills Committee (AISC) • Printing and Graphic Arts Industry Reference Committee • Other Industry Reference Committees (IRCs)
Government	• Australian Skills Quality Authority (ASQA) • Federal, State and Territory Departments • National Centre for Vocational Education Research (NCVER)
Employee representatives	• Australian Manufacturing Workers Union (AMWU) Print • Career advisors • Other unions
Employer representatives	• Australian Chamber of Commerce and Industry (ACCI) • Australian Graphic Design Association (AGDA) • Australian Industry Group (AIG) • Australian Sign and Graphics Association • Business Council of Australia (BCA) • Design Institute of Australia (DIA) • Printing Industries Association of Australia (PIAA) • Visual Connections • Other industry groups
Registered training organisations (RTOs)	• Private and community RTOs • Secondary schools (not all provide training) • Technical and Further Education institutions (TAFEs) • Universities (not all provide training)
Workers	• Graphic artists • Printers • Associated workers
Learners	• Domestic learners • International learners

The initial views on the challenges and opportunities faced by employers and learners are drawn from research, surveys and interviews by the SSO and IRC. In addition to face-to-face consultation and research, PwC's Skills for Australia created an Industry Voice Survey to facilitate broader consultation and engagement with employers across a variety of industries. There were 193 complete responses to the survey, which was open from the 19th of May to the 30th of June 2016, including 26 responses from employers in the printing and graphic arts sector. This sample is too small to assume that the views expressed by these respondents align with the wider views of the sector. Despite this, it is interesting to note that responses from the 193 employers across all industries broadly aligned with themes from a range of sources across the printing and graphic arts sector, with digital literacy identified as the most important skill. See Appendix D for more information.

Please also note that the initial view presented below will be verified and expanded through wide consultation with industry, employers and learners in the development of Business Plans and other ongoing work.

Employer challenges and opportunities

Drawing on initial consultations with employers in the industry, two key messages have been identified:

- **Resources need to be directed to training**
- **Printing is an evolving industry**

Resources need to be directed to training

As relayed by several Printing & Graphic Arts IRC Members, many employers in the printing and graphic arts sector have struggled to realise profit growth over the past decade, largely due to the transition from traditional information sharing mediums to digital media content. This has inhibited employer ability to invest in the recruitment and professional development of staff. Employers and other stakeholders emphasised the importance of staff development to give workers the right mix of new and traditional skills and to provide adequate training in basic leadership and related skills. In interviews, stakeholders noted:

> *Training is following the funding, so we are producing graphic designers who can design for web and mobile, but they can't design for printing machines*
>
> *Michelle Lees, Printing Industries Association of Australia*

- *Employers do not have the tools to support an apprentice* – Michelle Lees, Printing Industries Association of Australia
- *RTOs do not have the resources to invest in understand emerging printing technologies and establishing new courses given low enrolments* – Lorraine Cassin, AMWU Print

Printing is an evolving industry

Despite declining demand for traditional print media, employers noted several potential growth areas within printing, particularly in the customisable goods and 3D printing space. A common theme in consultations with our IRC, employers and professional institutions in the industry was the use of emerging print technologies to customise the user experience or market to users, such as on demand printing of customised goods as part of a multimedia marketing campaign. VET can play an important role in facilitating training as technology changes, ensuring employers have workers with appropriate skills, both technical and 'soft' to capitalise of technological change. In consultations, employers noted:

- *Less siloing of technical skills will result in a multifaceted worker, able to shift and change through different roles* – Julie Hobbs, Design Institute of Australia

Learner challenges and opportunities

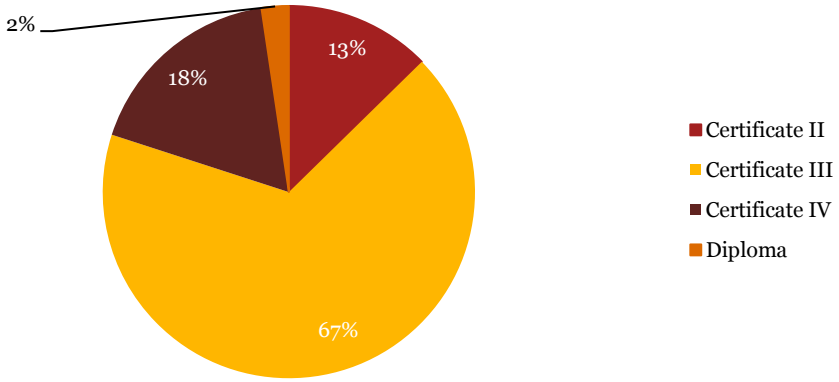
To give learners the best possible opportunity to get fulfilling jobs, and to help our country to succeed, it is important to understand the outcomes learners receive from training. It is first useful to understand a basic profile of learners and graduates in the ICP Training Package. A typical learner in the ICP Training Package is:

- **Above school age**. The majority of learners in the ICP Training Package (60 per cent) are over 25 years of age.[6]

6 National Centre for Vocational Education Research (2015) *Students and courses 2014*

- **More likely to be enrolled in lower level qualifications**. In the Training Package as a whole, 80 per cent of learners are enrolled in Certificate III qualifications or lower (see Figure 2).[7] This is reflective of both the structure of the ICP Training Package (as there is only one Diploma offered and nothing higher) as well as the choices made by learners.

Figure 2: ICP Training Package enrolments, by level of qualifications



Source: National Centre for Vocational Education Research (2015) *Total VET activity, program enrolments*
Note: enrolments are for 2014, previous to the Training Package restructure, therefore exact qualifications may no longer be representative

A typical graduate from the ICP Training Package is:

- **More likely to be employed than an average VET learner.** 82 per cent of ICP graduates are employed six months after training, compared to 74 per cent across the VET sector.[8]

- **Working in manufacturing**. Approximately 55 per cent of graduates were employed in the manufacturing industry, followed by 15 per cent in the professional, scientific and technical services industry, and 14 per cent in retail trade.[9]

- **Most likely to be employed in technical and trade roles.** Of those graduates employed after training, 46 per cent were classified as technicians and trades workers, compared to 19 per cent professionals and 13 per cent sales workers.[10]

- **Regardless of whether the learner was employed before training or not, wages are earning similar average wages.** Graduates who were employed prior to starting training earned $50,500 in 2015 (compared to $56,900 across the VET sector) and graduates who were not employed before studying earned $48,100 (compared to $46,900 across the VET sector).[11]

- **Less likely to go on to further training.** Less than a quarter of ICP graduates go on to further training compared to the 2015 average for graduates across all VET of 32 per cent.[12]

7 National Centre for Vocational Education Research (2015) *Students and courses 2014*

8 National Centre for Vocational Education Research (2015) *Government-funded student outcomes, VET students by Training Package*

9 National Centre for Vocational Education Research (2015) *Government-funded student outcomes, VET students by Training Package*

10 National Centre for Vocational Education Research (2015) *Government-funded student outcomes, VET students by Training Package*

11 National Centre for Vocational Education Research (2015) *Government-funded student outcomes, VET students by Training Package*

12 National Centre for Vocational Education Research (2015) *Government-funded student outcomes, VET students by Training Package*

It is also important to understand which aspects of training are serving learners well and which aspects can be improved. Drawing from the National Centre of Vocational Education and Research 2015 *Outcomes of government-funded graduates* data, a survey of 157 ICP graduates, two key messages have been observed:

- **Employment prospects are better than average**
- **Earnings are lower than average**

Employment prospects are good

ICP graduates have better employment outcomes than the national average, with 82 per cent of graduates employed or in further training within six months compared to 74 per cent for the total VET sector (see Figure 3). Of those employed, 77 per cent of graduates find their training relevant to their current occupation, with 45 per cent in the same occupation as their training course (see Figure 4).

Figure 3: Employment and training outcomes of all graduates (2015)

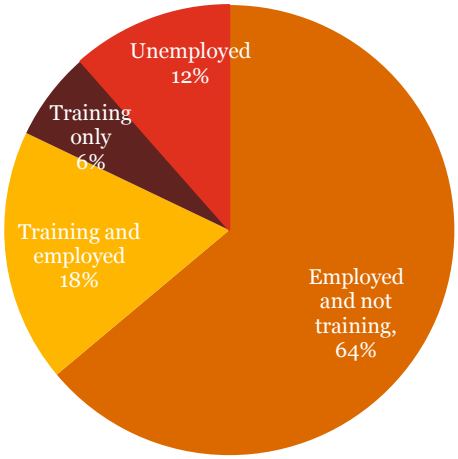
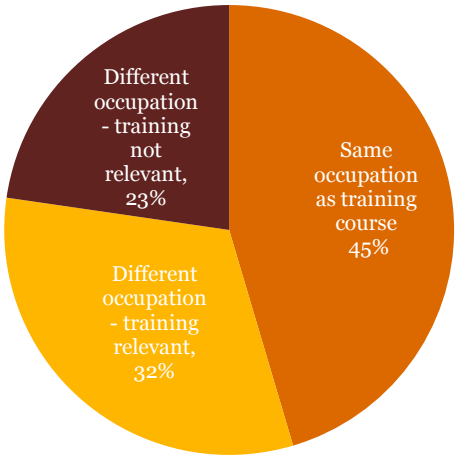


Figure 4: Relevance of training to occupation for employed graduates (2015)



Source: National Centre of Vocational Education and Research (2015) *Outcomes of government-funded graduates*

Earnings are lower than average

ICP graduates earned an average of $50,500 per annum (six months after completing a qualification), compared to $56,900 across the VET sector. Earnings are slightly lower for graduates who were not employed before undertaking training, at $48,100 per annum, compared to earnings of those employed before training at $50,500 per annum. Lower earnings may explain why only 71 per cent of graduates felt they received job related benefits, despite a strong rate of employment compared to other sectors.

C. Employment

The purpose of this section is to provide a broad overview of the magnitude and growth of employment in the printing and graphic arts sector, and to discuss the factors which are likely to influence the supply of printing and graphic arts graduates to fill positions in the sector. It provides context for a more targeted analysis of the specific trends influencing the printing and graphic arts sector, which flow through to skills priorities and training needs (discussed in later sections).

In order to help understand the scale and growth of employment in the printing and graphic arts sector, the Department of Education and Training has provided us with historical and projected employment data to be presented here. Please note that the Department of Education and Training provided employment data for both the 'Printing and Printing Support Services' and 'Other Personal Services' industries. However, 'Other Personal Services' is not present here as it is predominantly not covered by current ICP training. Although 'Other Personal Services' does include photographic film processing, this is only a small part of that disparate industry, and is not core to the printing and graphic arts sector or qualifications in the ICP Training Package. Please also note that as with any empirical analysis of employment, there are limitations in the representativeness of employment data. As such, the limitations of any data are presented in addition to this analysis.

Industry employment outlook

Employment projections at an industry level are confined to specific industry definitions used for statistical classification (as defined by ANZSIC).[13] The 'Printing and Printing Support Services' industry is the most indicative of printing and graphic arts employment and therefore is the industry which the Department of Education and Training has provided data for to be presented here.

Figure 5 below shows both historical and forecast employment of the 'Printing and Printing Support Services' industry. However before interpreting this data, it is important to recognise its limitations. The scope of the 'Printing and Printing Support Services' industry as defined by ANZSIC excludes some workers in the broader printing and graphic arts industry as:

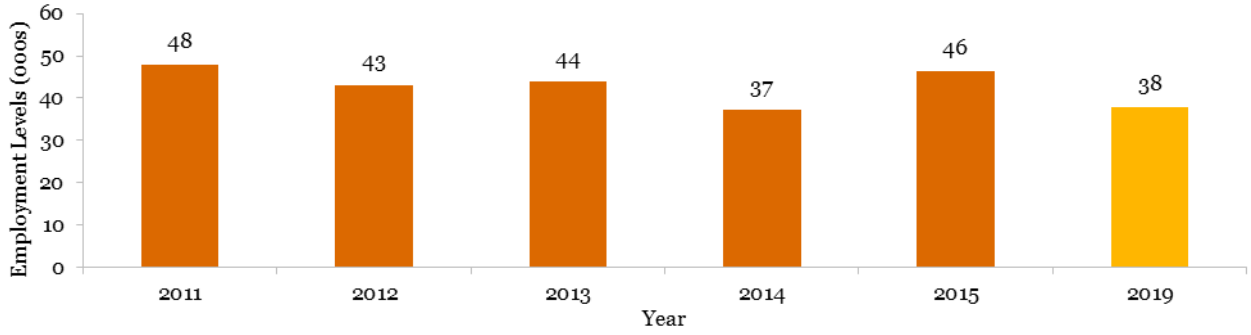
- Only employment which directly relates to the printing of documents and images is included in this definition. Employment which relate to web design and graphic arts are not included in the ANZSIC definition of 'Printing and Printing Support Services'.
- Not all media printing is included in the 'Printing and Printing Support Services' industry. The 'Printing and Printing Support Services' industry only includes entities involved in printing of media such as newspapers or magazines without publication.[14] Employment in other integrated entities which both publish and print media such as newspapers or magazines is excluded.
- Upstream services which printing and graphic arts workers may be involved in are not likely to be captured in this definition. Services which related to print, but not directly part of the printing process such as e-publishing, developing marketing strategies, graphic design or advice on how to effectively run a print advertising campaign are typically not included in the 'Printing and Printing Support Services' industry.
- Customisation of some printed products are not captured in the 'Printing and Printing Support Services' industry. For example, employment in the production of self-published books or custom greeting cards are captured in the 'Book Publishing' and 'Other Publishing' industries respectively.

[13] Australian Bureau of Statistics (2006) *Australian and New Zealand Standard Industrial Classification* Cat. No. 1292.0

[14] Australian Bureau of Statistics (2006) *Australian and New Zealand Standard Industrial Classification* Cat. No. 1292.0

Recognising these limitations, projections in Figure 5 indicate a decline in employment of 4.4 per cent per annum over four years from 2015 within the 'Printing and Printing Support Services' industry.

Figure 5: Employment levels – Printing and Printing Support Services



Source: Department of Education and Training provided graphics, based on data from the Department of Employment Labour Market Information Portal.
Note: Figures are displayed at the ANZSIC Division level 161. The graph includes current and historical employment levels, as well as a projected employment level to 2019

The likely key drivers of this forecast are as follows:

- **Ongoing technological improvements such as automation in print technology**. As print technology improves, it is likely that fewer workers will be required to produce the same quantity of output.

- **Changes in the print technology mix**. As the printing industry continues to shift away from offset printing towards digital print technologies, fewer workers directly involved in printing will be required. Digital printing typically requires fewer staff than offset printing due to the higher number of processes involved in offset printing, such as plate preparation, printing, and binding/finishing function.[15]

- **The shift towards non-traditional service offerings and new product segments.** The printing and graphic arts sector is shifting towards services and products not traditionally offered by the 'Printing and Printing Support Services' industry (see Section D). As this shift continues, it is likely that fewer employees will be captured in the statistical definition of the 'Printing and Printing Support Services'. As such data presented in Figure 5 will likely show a decline in the industry, as businesses shift to non-traditional service offerings.

As noted above, the projected employment decline in Figure 5 does not necessarily reflect the entire printing and graphic arts sector. While employment of workers directly involved in printing may be declining, growth in new product segments and service offerings may offset some of this decline. As such, it is likely that the decline will be slower than 4.4 per cent, offset by growth in new segments of the sector.

Occupational employment outlook

Employment can also be viewed at an occupation level (occupations in employment statistics are defined by ANZSCO).[16] Viewing the printing and graphic arts sector as a set of related occupations serviced by the ICP Training Package is likely a more complete view of the printing and graphic arts sector. The Department of Education and Training has provided us with current and projected employment levels in five broad groups of occupations in which printing and graphic arts employment is contained within, as shown in Figure 6.

15 Queensland Government (2005) *Queensland Government Department of Public Works Phase 2 Report: Goprint*

16 Australian Bureau of Statistics (2006) *Australian and New Zealand Standard Classification of Occupations* Cat. No. 1220.0 (2006)

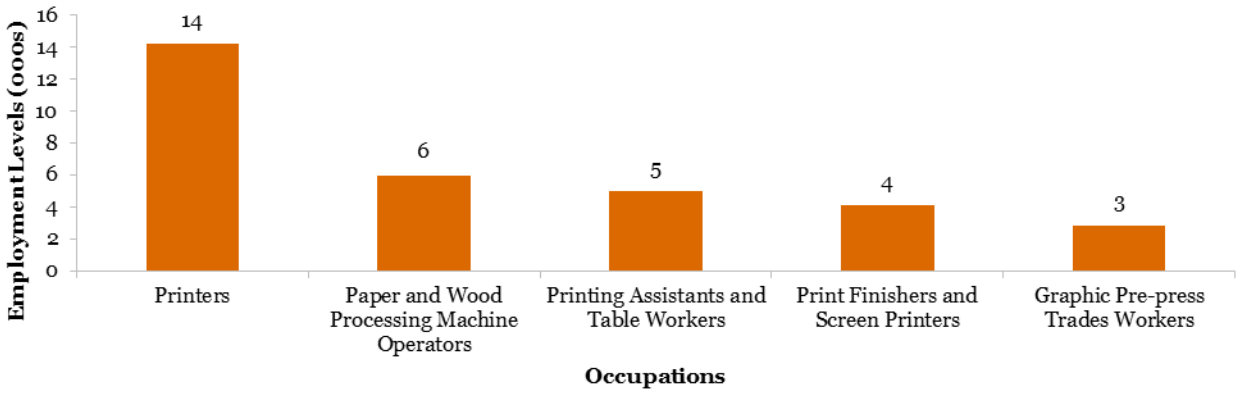
Before interpreting the provided employment levels of key occupations, it is important to understand some of the limitations in this approach, namely:

- Graphic artists or web-designers who work in the printing and graphic arts sector are excluded from the data in Figure 6.

- 'Paper and Wood Processing Machine Operators' is listed as a key occupation in the printing and graphic arts sector. While this occupational group does include operation of machinery used in production of printed paper packaging, it also includes those people involved in the manufacture of logs, plywood, solid laminates and similar timber products. As such, large proportion of employment in this occupational group is unrelated to the printing and graphic arts sector.

In spite of the limitations discussed above, Figure 6 shows some of the key occupations which make up a significant proportion of the printing and graphic arts sector.

Figure 6: Employment levels – key occupations (annual average 2010-15)



Source: Department of Education and Training provided graphics, based on data from the Australian Bureau of Statistics
Note: Occupations are at the four digit ANZSCO code (Minor Groups). Employment levels are the five year annual average to 2015. Figures include all employed in the occupation across the economy, not just the relevant industry.

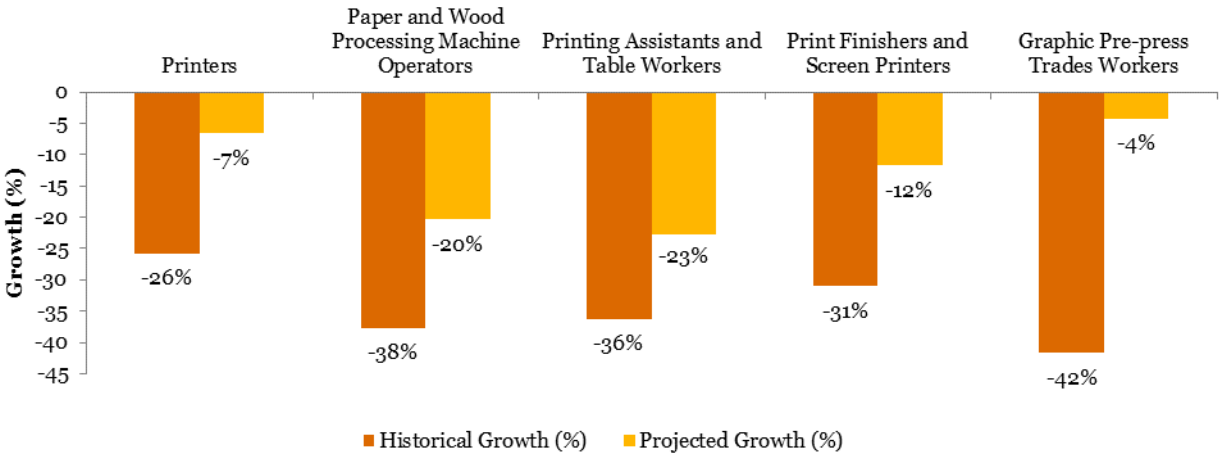
In order inform discussion of the future employment in the printing and graphic arts sector, current employment levels need to be read alongside projected employment growth. Figure 7 shows the historical and projected employment growth for the same five occupations in listed in Figure 6.

However before interpreting the provided employment growth and projections in Figure 7, it is important to understand some of the limitations namely:

- Occupation level employment is inherently difficult to project forward. Part of the difficulty in producing accurate projections is the changing job roles of those involved in the printing and graphic arts sector. Changing job roles may cause workers to shift out of listed key occupations. For example, a printer who moves towards more of a graphic arts role would not be captured within the Department of Education and Training provided key occupations.

- Employment is dependent on factors which are difficult to predict. Overall print volumes and hence employment is likely depended upon consumer preferences for printed mediums over digital mediums. Further, the number of workers directly involved in the printing process i.e. 'Printers', 'Printing Assistants and Table Workers' is likely to be heavily dependent upon technical advancements in print machinery and software as well as the uptake of this technology by the sector.

Figure 7: Historical (2010-15) and projected employment growth (2015-19) – key occupations



Source: Department of Education and Training provided graphics, historical employment growth data from the Australian Bureau of Statistics (ABS) and projected employment growth data from the Department of Employment.
Note: Occupations are at the four digit ANZSCO code. The historical employment is the five year growth rate to 2015 and the projected employment growth rate is the expected growth rate to 2019. Rates are based on figures that include all employed in the occupation across the economy, not just the relevant industry

Using the key occupations growth projections provided in Figure 8 (excluding 'Paper and Wood Processing Machine Operators') shows that the weighted average growth in the Department of Education and Training provided projections is -2.7 per cent per annum over a four year period.[17] As discussed above, this projected growth rate is not likely to be representative of the employment growth outlook for particular parts of the printing and graphic arts sector, such as workers involved in graphic arts, web-design and multi-channel marketing.

Supply side challenges and opportunities

An important consideration in determining the magnitude and growth of employment in the printing and graphic arts sector is the supply of graduates trained for work in the sector. Although employment is projected to fall (at least in some parts of the sector), a full understanding of the future industry direction should also consider how employment demand will be met. This requires an understanding of the factors which are likely to influence the decisions of learners to enrol in printing and graphic arts training and the supply of workers with training in the sector.

Table 4 lists some of the factors which may influence the decision of workers to undertake printing and graphic arts training and enter a role within the sector. This list includes influences that may not be applicable to every role in every organisation. It is acknowledged that not all occupation and education decisions are made on a rational basis and it can be inherently difficult for an individual to weigh up these long term factors. Emotion and perception are likely to play a large part in the career decisions of workers, rather than explicit analysis of the factors listed in Table 4.[18]

It should be noted that (as discussed elsewhere in this Work Plan) most of the factors in the below table represent challenges (rather than opportunities) to encouraging participation in the printing and graphic arts workforce. However, this does represent an opportunity to change some of these perceptions through training design, rather than succumbing to them as inevitable.

[17] Weighted average of projected growth rates based on current employment of key occupations excluding 'Paper and Wood Processing Machine Operators'.

[18] Jim Bright, Robert Pryor, Sharon Wilkenfeld, & Joanna Earl (2005) - *The Role of Social Context and Serendipitous Events in Career Decision Making*- International Journal for Educational and Vocational Guidance Vol 5 (1): 19-36

Table 4: Supply side influences

Supply side influence	Details
Reputation	As discussed in Section D, there is a public perception that the printing and graphic arts sector offers a poor employment outlook. Part of this reputational issue is a poor of awareness of what printers actually do and what broader service offerings the printing and graphic arts sector provides. Research and consultations with the IRC has revealed that the sector is often misunderstood by potential workers and career advisors. Potential learners are often discouraged from engaging in training, with careers advisors not recommending training in the printing and graphic arts sector as a pathway to employment.[19] While printing occupations tend not to be highly regarded by society, graphic arts occupations do tend to be highly regarded. On the Australian Socioeconomic Index, printing occupations have a weighted average score of 34 whereas graphic arts occupations have a weighted average score 67 (where the average occupation score is approximately 50 and scores range from a low status of 0 to a high status of 100).[20]
Wages	Data indicates that Printing and Graphic Arts VET graduates tend to receive relatively low starting wages with often limited opportunities wage growth. However this is not the case for all occupations in the sector, with graphic and web designers, and illustrators tending to earn higher wages. • In 2014-15, Printing and Graphic Arts VET graduates received an average annual salary of $50,400, six months after graduation, compared to an average of $57,100 for all VET graduates (average of graduates employed and not employed before training).[21] • Employee earnings for all occupations across the economy average $1,182 a week. In contrast, printing occupations, such as binders, finishers and screen printers ($776 per week), graphic pre-press trade workers ($1,004), printers ($1,111), and printing assistants and table workers ($846) tend to earn below average wages. On the design side, however, graphic and web designers, and illustrators earn an average of $1,278 per week. • Progression pathways are often limited due to the prevalence of small or family-owned businesses with little room to develop in to more senior roles or ability to invest in employee development.[22]
Working conditions	As relayed by the Printing & Graphic Arts IRC, working conditions in the printing and graphic arts sector vary by occupation. In some occupations such as graphic design, illustration or web-design working conditions are generally good, with little manual labour, stable employment and good employment opportunities with a variety of employers. Other sub-sectors such as news printing tend to have poorer working conditions. In some cases, news printing workers are required to work in nightshifts and non-standard workdays to meet production deadlines.
Lateral movement	The IRC has indicated that the older workforce, along with the prevalence of small businesses, can make it difficult for workers to progress upwards or across organisations and does not create space for new workers to enter (see Section D).

[19] Julie McMillan, Adrian Beavis, & Frank L. Jones, (2009) *The AUSEI06: A new socioeconomic index for Australia, Journal of Sociology.* Vol 45(2): 123-149.

[20] Julie McMillan, Adrian Beavis, & Frank L. Jones, (2009) *The AUSEI06: A new socioeconomic index for Australia, Journal of Sociology.* Vol 45(2): 123-149.

[21] National Centre for Vocational Education Research (2015) *Government-funded VET graduate outcomes, salaries and jobs*

[22] Canon (2009) *Digital Printing Directions*, available at <http://www.canon.fr/Images/Insight_Report-v1_0_tcm79-612893.pdf>

Supply side influence	Details
Funding	Funding of VET is a complex and dynamic area. Programs to assist learners undertake training exist at both a state and federal level. For example, the federally funded VET-FEE HELP program provides loans to pay tuition fees for VET. State and Territory governments also have various programs in place to assist learners undertake training which may vary by jurisdiction, qualification, provider and background of the learner undertaking training. Consultation with an IRC member has revealed that government funding for retraining can often be difficult to access. As a result of the same standardised industry or occupation definitions being applied to a number of qualifications within the Printing and Graphic Arts Training Package, qualifications may be seen as equal for the purposes of funding. This may mean for example an offset printer, with an existing printing qualification wishing to retrain in pre-press and front-end application design is unable to access government funding to do so.One part of the complex funding arrangements are to target specific qualifications as priority needs and single out these qualifications for subsidies in addition to other subsidies offered on a non-qualification specific basis (such as for particular cohorts of students). Each jurisdiction has a different list of identified priorities and ICP qualifications included are listed below (although this does not exclude subsidies being available under other programs): • **New South Wales** – No ICP qualifications are listed on the 'Jobs of tomorrow scholarships eligible qualifications list'. However, the 'NSW Skills List' lists contains all Certificate II and III qualifications in Printing and Graphic Arts, meaning these qualifications are may be eligible for subsidy, depending on the provider. • **Victoria** – All current ICP qualifications are listed on the 'Funded Course Report'. • **Queensland** – Currently, no ICP qualifications are listed on the 'Queensland Training Subsidies List'. • **Western Australia** – Currently, no ICP qualifications are listed under Future Skills WA 'Priority industry qualifications list'. • **South Australia** – The South Australian 'Subsidised Training List' currently lists available places in Certificate III in Printing, Certificate III in Print Manufacturing and Certificate III in Print Communications. Additionally places are available under the 'Jobs First' program in Certificate II in Printing and Graphic Arts (General). • **Tasmania** – Qualifications at a Certificate III or higher level can be identified by industry as 'entry-to-work' level for Tasmanian training entitlements, depending upon whether or not training delivered to apprentices or trainees.[23] Currently agreements with RTOs are in place to deliver subsidised training in Certificate IV in Printing and Graphic Arts and Certificate III in Print Communications as well as some superseded Printing and Graphic Arts qualifications. • **Northern Territory –** The 'Northern Territory Training Entitlement' currently does not list any ICP qualifications, however all ICP qualifications are supported through the general skills training program. • **Australian Capital Territory –** Currently, there are no ICP qualifications listed on the 'Skilled Capital Qualification List'. It is acknowledged that this area is complex and a brief summary cannot capture every detail of funding. Depending on a learner's circumstances there may be restrictions to the subsidies listed here and subsidies other than those listed here also be available.

[23] Kaye Bowman and Suzy McKenna - Jurisdictional approaches to students entitlements: commonalities and differences – NCVER research report <https://www.ncver.edu.au/__data/assets/file/0022/17149/jurisdictional-approaches-to-entitlements-2847.pdf> accessed 12/07/16

As shown in Table 4 above, the supply side influences are not generally positive in printing and graphic arts sector. However, occupational choice and education decisions tend not to be made on a rational basis which can make it difficult to determine the future supply of graduates trained for work in the sector, this does imply that fewer graduates are likely to available.[24] Having the right number of people entering the labour market for certain occupations is different to those people having the right, future fit, skills. The following section analyses the trends affecting these potential workers and how training can ensure the supply of workers is skilled correctly to meet future employment needs.

[24] Jim Bright, Robert Pryor, Sharon Wilkenfeld, & Joanna Earl (2005) - *The Role of Social Context and Serendipitous Events in Career Decision Making*- International Journal for Educational and Vocational Guidance Vol 5 (1): 19-36

D. Skills outlook

Understanding the global and domestic forces driving change in the Australian job market is crucial to workforce planning, and therefore a critical step in mapping the skills that should be prioritised in the printing and graphic arts sector.

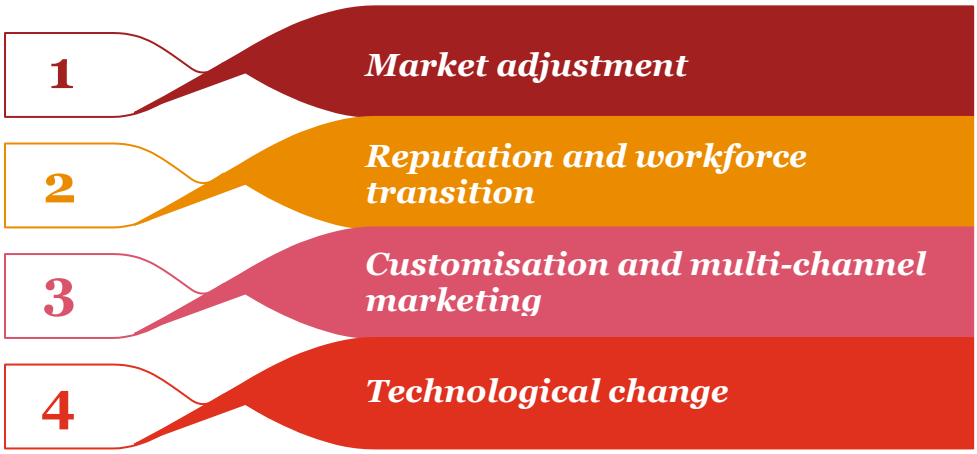
Global and domestic environment

The past two decades has seen the rise of Asian economies, such as China and India, and sluggish growth in developed countries as they struggle to recover from the aftermath of the global financial crisis. Australia has capitalised on emerging market growth to date, and has been largely sheltered from the decline in developed countries, with much of Australia's mining boom attributable to an increasingly urbanised China's demand for natural resources. As a result, Australia has enjoyed nearly 24 years of solid economic growth at an average annual growth rate of 3.3 per cent (far above the G7 average of 1.6 per cent over the same period).[25]

Australia now faces challenges in maintaining this level of growth. Our economy is in transition from a period of resource driven growth to services based growth. In 2015, real living standards actually declined and unless we have a flexible skilled labour force ready to adapt to changes in the labour market, the transition of the Australian economy will continue to drag on our standard of living.[26]

Trends shaping the sector

This section outlines **four key trends** shaping the printing and graphic arts workforce over the medium to long term.



1. Market adjustment

There is a perception that the printing and graphic arts sector is in decline, based on the performance of some products, particularly print media. However, the printing and graphic arts sector does not just generate information media, but produces a diverse range of products and services, including:

- the design and production of information media such as books, magazines, newspapers, financial and legal documents
- the strategy, design and production associated with promotional materials such as catalogues, direct mail, brochures and other collateral

[25] Australian Bureau of Statistics (2015) *National Accounts: National Income, Expenditure and Product, cat. No. 5206.0 September 2015*, OECD Economic Outlook: Statistics and Projections, *Real GDP forecast, Annual growth rate 1992-2015.*

[26] Australian Bureau of Statistics (2015) *National Accounts: National Income, Expenditure and Product, cat. No. 5206.0 September 2015,* GDP per capita (seasonally adjusted, chain volume measures) decreased by 0.2% in the June 2015 quarter

- the design and production of packaging products such as labels and printed folding, corrugated and flexible cartons
- consumer products such as plastic cards, stationery, signage and manufacturing components
- outdoor advertising products such as display banners
- omni-channel marketing and communications services, from inception to delivery. This includes development of the initial marketing strategy and design through to the delivery of messaging across multiple channels and platforms such as web, mobile and print.[27]

When examining market growth and potential of the sector, it is important to recognise the different factors that may influence demand for all these products.

Data indicates that consumer preference for printed physical media is slowing. Consumers are demanding more convenience and multiple channels for consuming media, driven by the digitisation of traditionally printed mediums such as magazines, newspapers and books.

- Consumer spending on print newspapers is projected to decrease by approximately half over the five years from 2014-2019 ($1,218 million to $612 million). Over that same period, spending on digital newspapers is expected to grow almost four-fold ($76 million to $372 million).[28]
- Similarly the mix of spend of advertising between print newspapers and digital newspapers is expected to change, from approximately 80 per cent of spending in print and 20 per cent in digital in 2014, to 57 per cent and 43 per cent respectively in 2019.[29]
- Similar trends of a reduction in print and strong growth in digital with print remaining dominant in total size is also predicted in consumer books and magazines.

However, there are trends outside of print media that influence demand in the printing and graphic arts sector.

- **Overall business activity**. Businesses require a range of printed products such as business cards, brochures, documents, report and signs. Therefore, an increase in the total number of businesses tends to positively affect demand for printing services. As the overall number of businesses in Australia is projected to increase, at least in the short term, this is expected to be a driver of demand in the sector.[30]
- **Food manufacturing**. Over the past five years, even as other printing services have slowed, demand for food products that require printed labelling and packaging has remained steady.[31] There are also areas for potential growth in the printing and graphic arts sector, including environmentally sustainable packaging and packaging that incorporates QR codes to track food products.

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27 Canon (2009) *Digital Printing Directions*, available at <http://www.canon.fr/Images/Insight_Report-v1_0_tcm79-612893.pdf>

28 PwC (2015) *Australian Entertainment and Media Outlook 2015-2019: Innovation in Australia: Having a go*

29 PwC (2015) *Australian Entertainment and Media Outlook 2015-2019: Innovation in Australia: Having a go*

30 IBISWorld (2015) *IBISWorld Industry Report C1611 Printing in Australia*

31 IBISWorld (2015) *IBISWorld Industry Report C1611 Printing in Australia*

There are areas for potential growth in the printing and graphic arts sector, including environmentally sustainable packaging and packaging that incorporates QR codes to track food products. There has been massive investment into the 'food packaging revolution'

Lorraine Cassin, AMWU Print

- **Retail trade**. Retail trade is a large user of print manufacturing, requiring product labels, packaging materials, point-of-sale promotions as well as catalogues and direct-mail advertising. Increased retail trade may drive an increase in demand for these print products.[32] Forecast employment for the retail industry is shown in Figure 8 and, as a labour intensive industry, employment is a reasonable proxy for overall industry activity. This shows the industry increasing over the medium term.

- **Direct mail**. In retail advertising, direct mail advertising in particular is seen as having high growth potential.[33] This comes after several years of unpopularity and decline, as new technologies are making the customisation of direct mail advertising more easily attainable.[34] Australian consumer research has shown that catalogues, flyers and personalised direct mail ranked above any digital advertising channel in effectiveness.[35] This effectiveness is likely to mean that these physical printed advertising channels are retained by retailers. This view of resurgence of direct mail has been confirmed by consultations with Printing & Graphic Arts IRC members.

- **Emerging product offerings**. Although in many cases, these products currently only make up a small part of the production in the sector, Printing & Graphic Arts IRC members have identified the following emerging product offerings (in addition to the key trends above): vinyl wrap printing, glass and metal printing, display boards and materials, radio frequency identification (RFID) embedded printed product, localised custom web printing.[36]

32 IBISWorld (2015) *IBISWorld Industry Report C1611 Printing in Australia*

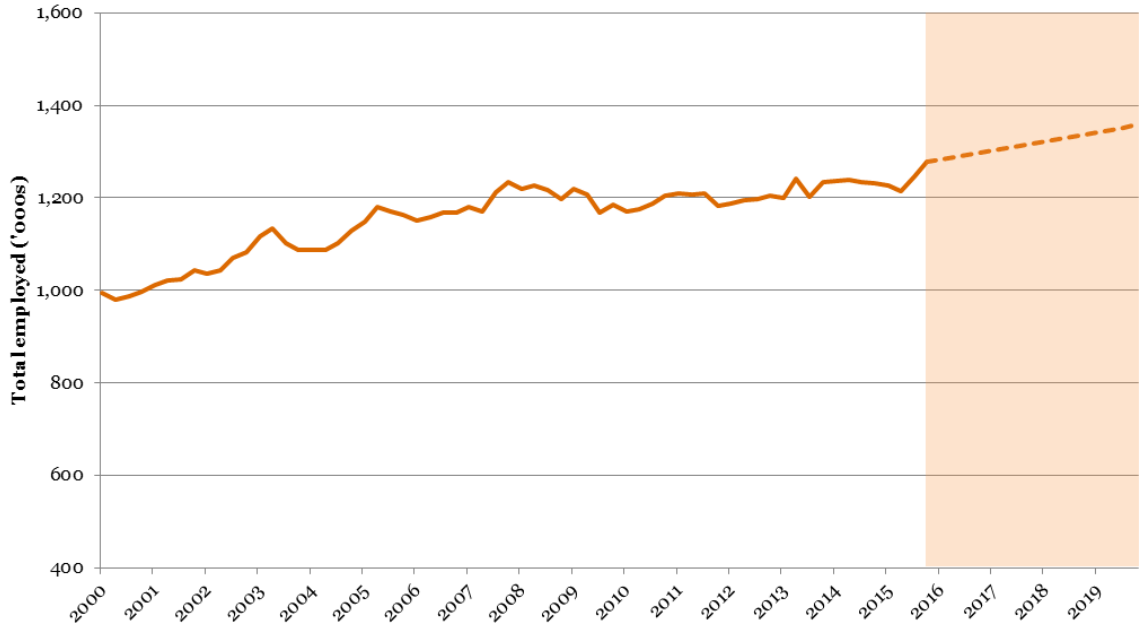
33 Canon (2009) *Digital Printing Directions*, available at <http://www.canon.fr/Images/Insight_Report-v1_0_tcm79-612893.pdf>

34 Marketing Mag (2014) *Direct mail: have we reached peak saturation or is it still a strong option for marketers?*, available at <https://www.marketingmag.com.au/news-c/direct-mail-have-we-reached-peak-saturation-or-is-it-still-a-strong-option-for-marketers/>

35 Australia Post (2013) *Creating connections that matter*

36 Discussed with IRC members at formal SSO and IRC meeting, August 2016.

Figure 8: Retail industry employment projections



Source: Australian Bureau of Statistics (2015) *Labour Force, Australia, cat. no. 6291.0.55.003*. Department of Employment (2015) *Employment Projections to November 2019*

Another trend that may continue is movement of printing and design services in-house, as opposed to contracting outside printing businesses. Lower costs and the improving quality of smaller machines have made small in-house print runs more economical, reducing demand for external printing services.[37] However, whilst this may appear as a decline in sector activity, it does not necessarily mean a decline in printing and graphic arts occupations. These workers may be brought in-house to non-printing businesses, but will still work in the sector and use the skills that could be contained in the ICP Training Package.

While overall sector activity is forecast to be weak, there are still areas of potential growth and promise. The overall outlook may be more a story of redistribution, between different sub-sectors of products and in the types of firms in the sector, rather than one of overall decline.

What does this mean for the printing and graphic arts sector workforce?

Job demand	• Potential redistribution between traditional print media to other printing services.
Skills needs	• As the kind of printing and graphic arts products and services demanded changes and redistributes, workers will need agility to move between different kinds of printing or technology and different organisations.

[37] IBISWorld (2015) *IBISWorld Industry Report C1611 Printing in Australia*

2. Reputation and workforce transition

A challenge for the printing and graphic arts sector is attracting talent and maintaining a motivated and capable workforce. This appears to be stemming from three core issues:

- **Perception and reputation of the sector**
- **Working conditions and prospects**
- **An ageing and static workforce**

Combined these issues mean that new talent and skills are not entering the industry at a rate that might otherwise be expected. It is therefore important that any new workers that are being trained will come with the critical and creative thinking skills that will help bring fresh perspectives to the sector.

Perception and reputation of the sector

As explored in the previous trend, some parts of the printing and graphic arts sector are in decline due to the popularity and prevalence of digital distribution channels. Whilst there are other sub-sectors with stronger prospects, it is those that are struggling that are publicly seen as core printing business and that receive the most public attention and coverage. This has led to a public perception of an industry that is struggling and caught in the past. Part of this reputational issue is a low amount of awareness of what printers actually do and what broader service offerings the printing and graphic arts sector provides.

The concern is that because of a misunderstanding of the sector, potential workers are discouraged from even engaging in training, with careers advisors not recommending the printing and graphic arts sector as a pathway and parents encouraging children to enter university rather than technical qualifications. This perception may need to be addressed before training content is designed, to reposition the public perception of the printing and graphic arts sector. This may include the need for better communications of pathways in the sector, which are built around entry level apprenticeships at a Certificate III level, with further learning often informal either on the job, through accredited vendor or short course training, or recognition of prior learning.

Working conditions and prospects

Whilst the perception of the printing and graphic arts sector is affecting its ability to attract talent, some of the realities of working in the sector are not assisting in portraying it as desirable.

- Some sub-sectors of printing (such as newsprinting), by their nature, are night or shift work and can be 365 days a year. These hours and style of work can negatively impact on employee lifestyle.
- Earning potential immediately after training is lower for a graduate from the ICP Training Package (an average salary of $50,500 being earned six months after training) than the average for all VET graduates ($56,900).[38]
- Employee earnings for all occupations across the economy is an average of $1,182 a week. In contrast, printing occupations earn less, such as binders, finishers and screen printers ($776 per week), graphic pre-press trades workers ($1,004), printers ($1,111), and printing assistants and table workers ($846). On the design side, however, graphic and web designers, and illustrators earn an average of $1,278 per week.[39]

[38] National Centre for Vocation Education Research (2015) *Government funded student outcomes survey, results by Training Package.* Note that these employment outcomes are only for graduate who have completed a qualification six months ago and therefore are not long term outcomes.

[39] Australian Bureau of Statistics (2014) *Employee Earnings and Hours, Australia, May 2014, cat. no. 6306.0.* Note that this data is for all employees, whether they have completed formal training or not, so may be reduced by lower skilled workers. The data is also constrained by ANZASCO occupation definitions and may not fully represent the printing and graphic arts sector.

- Progression pathways are often limited due to the prevalence of small or family-owned businesses with little room to develop in to more senior roles or ability to invest in employee development.[40] Printing and printing services had just over 6,000 businesses operating at June 2015. Of these, 42 per cent were non-employing and 53 per cent had only 1-19 employees.[41]

An ageing and static workforce

Anecdotal evidence from IRC members has indicated that the printing and graphic arts workforce is relevantly static, with low turnover. The average worker is older and in many cases has less desire to up-skill or progress, and would prefer to stay in a steady position. However, it is recognised that this is not the case for all subsectors within the printing and graphic arts sector.

The average age of workers is relatively old. The average age of binders, finishers and screen printers is 42; graphic pre-press trades workers is 38.9; printers is 43.4; printing assistants and table workers is 45.3; and graphic and web designers, and illustrators is 35.4.[42]

Although it is recognised that this is not the case in all subsectors and businesses in the printing and graphic arts industry, the older workforce, along with the prevalence of small businesses makes it difficult for workers to progress upwards or across organisations and does not create space for new workers to enter. This is creating skills gaps in the overall workforce such as:

- lack of adaptability or openness to new ideas as process is influenced by tradition
- less up to date knowledge as formal training was conducted longer ago
- lack of a cohort of emerging leaders to provide mentorship, which is of particular concern, as when the older cohort all approaches retirement together, there will be no one to guide replacement staff.

What does this mean for the printing and graphic arts sector workforce?

Job demand	• Low turnover and static workforce means that employer demand for workers is low. • Reputation and perception of poor employment prospects means that supply of potential employees is also low. • Potential emerging talent gap as current workforce nears retirement.
Skills needs	• Adaptability and creative thinking skills to combat a static and tradition driven workforce. • Leadership, teamwork and mentoring skills to develop new workers entering the sector.

[40] Canon (2009) *Digital Printing Directions*, available at <http://www.canon.fr/Images/Insight_Report-v1_0_tcm79-612893.pdf>

[41] Australian Bureau of Statistics (2014) *Employee Earnings and Hours, Australia, May 2014, cat. no. 6306.0*

[42] Australian Bureau of Statistics (2015) *Count of Australian Businesses, including Entries and Exits, Jun 2011 to Jun 2015, cat. no. 8165.0*

3. Customisation and multi-channel marketing

As described above, some sections of the printing and graphic arts sector are declining and organisations will need to respond to stay successful and responsive to market demands. Industry participants will need to think more creatively in seeking markets and pushing boundaries to enter non-traditional service offerings. Based on research and consultations with IRC members, two examples of the industry achieving this have been identified:

- **Data driven customisation**
- **Multi-channel marketing**

The overall focus of these new service offering developments is a shift toward a consumer focus. 'While digital convergence within the industry has led to a paradigm shift in recent years that has seen the industry move from traditional 'manufacturing' to one with a stronger focus on 'service', it nevertheless remains the third largest manufacturing industry in Australia'.[43]

The result of the shift in service offering is that organisations which traditionally sat in the printing and graphic arts sector are expanding and now employ a greater proportion of non-printing roles. However, they are likely to retain printing as a core service offering and will still employ workers in core printing and design occupations. These printing technician occupations will not be transformed in to data analysts or marketing specialists, however, to operate in these broader organisations, printing and graphic arts workers will need to understand the more diversified businesses in which they sit and their alignment to the organisation. Particularly as workers develop in to more senior roles, they will require skills in industry awareness, adaptability and collaboration.

Data driven customisation

Modern digital printing technologies allow for each individual copy made to have customised graphics and text. This has allowed for new services to be offered by the printing and graphic arts sector including:

- **Targeted promotional materials.** Businesses are able to send more targeted and customised marketing material to individual customers on the basis of demographics or observed preferences.
- **Trans-promotional messaging**. Businesses sending letters such as bills are able to include full colour customised targeted advertising messaging as a part of the document.

Variable data printing requires skills in managing the databases from which personalised data is stored, as well as using special purpose layout programs. Customisation will also need an increasing use of data for segmentation and predictive analytics. Whilst the technical analytics may fall outside the realm of job requirements of an ICP graduate, they will need an understanding of the consumer demand for customisation and how it impacts their business.

> *Personalisation of goods is possible with sophistication of data, giving the consumer an interesting and unique customer experience through print*
>
> *Kerim El Gabaili, One Point*

[43] Printing Industry Association of Australia (2015) *Submission to the Productivity Commission Inquiry – Workplace Relations Framework*, available at <http://www.pc.gov.au/__data/assets/pdf_file/0009/187956/sub0139-workplace-relations.pdf>

Multi-channel marketing

In response to demand for traditional print media declining, businesses are refocussing towards multi-channel marketing which includes traditional print as a part of a wider marketing business.

> *'Multi-Channel marketing simply refers to sending out a message utilising more than one communication channel. With so many touch-points available to marketers it is important that the strengths and weaknesses of each communication channel are understood'*[44]

Working in a multi-channel context will require workers with a broader skill set, incorporating digital graphic design components, marketing skills, and the traditional printing skills.

What does this mean for the printing and graphic arts sector workforce?

Job demand	• It is expected that new service offerings such as customisation and multi-channel marking will create new jobs, outside the traditional core printing and graphic arts occupations. However, a core set of printing occupations within these organisations will still remain.
Skills needs	• Traditional print and design workers need to be able to operate in a multi-channel environment, including awareness of industry trends and data availability, collaboration and creative and critical thinking.

4. Technological change

The printing and graphic arts sector is heavily reliant upon printing hardware and software, both of which are continuing to change.[45] Technological changes are continuing to alter the roles in which people work and the service offerings of the industry. Three major changes have been identified:

- **Shift in printing technology from offset to digital.** Increased uptake of digital printing is changing the skills required to operate equipment.
- **On demand printing.** Cost-effective technology enables the industry to offer new services to book publishers and individuals.
- **3D printing.** Presents a significant growth opportunity for the printing and graphic arts industry.

Shift in printing technology from offset to digital

The continued shift towards digital print technology is altering the types of print products produced by the Australian printing and graphic arts sector as well as the nature of employment within the industry. Historically, the sector has been mainly comprised of offset printing, producing large volume printed products at a low unit cost.[46] The industry is now shifting towards newer digital printing technologies such as commercial inkjet printing (see Figure 9). 'It is digital technologies that dominate in terms of growth'.[47]

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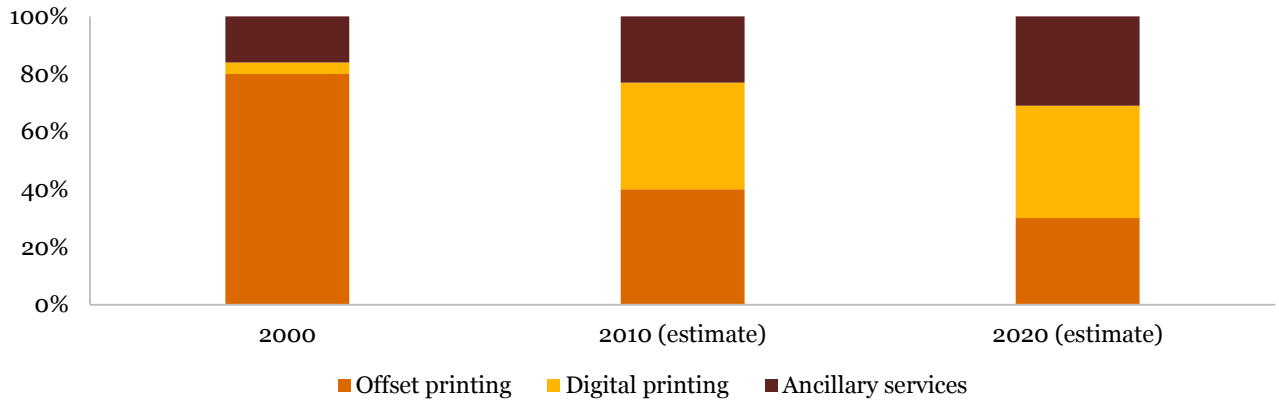
44 Bright Print Group (2015) *Multi-Channel Marketing*, available at <http://www.brightprintgroup.com.au/main/index.php/services/integrated-marketing>

45 Average annual capital expenditure by the Australian printing industry is $215 million (5 years to Dec 2015). Australian Bureau of Statistics (2016) *5625.0 Private New Capital Expenditure and Expected Expenditure, Australia*

46 Canon (2009) *Digital Printing Directions*, available at <http://www.canon.fr/Images/Insight_Report-v1_0_tcm79-612893.pdf>

47 Drupa (2016) *2nd Global trends report*, available at <http://www.drupa.com/cipp/md_drupa/custom/pub/content,oid,32300/lang,2/ticket,g_u_e_s_t/~/2nd_drupa_Global_Trends_report.html>

Figure 9: Commercial revenue streams 2000 to 2020



Source: Canon (2009) *Digital Printing Directions*

Shifting of technology towards digital printing technology has both reacted to and enabled reduced print run lengths. Figure 10 shows that shorter run jobs are have been making up a larger proportion of total print volumes in recent years, with estimates indicating this trend is likely to continue. As a result of the shift towards shorter print runs, the nature of employment within the sector is changing in a number of ways:

- **Fewer technical staff involved directly in printing**. Digital printing typically requires fewer staff than offset printing due to the higher number of processes involved in offset printing, such as plate preparation, printing, and the binding and finishing function.[48]

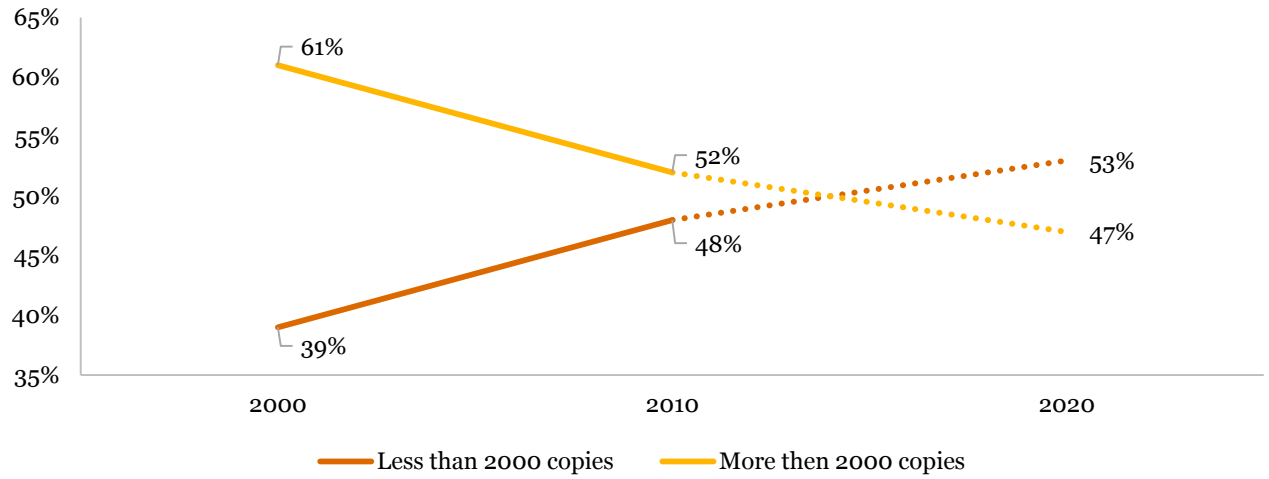
- **A shift towards customer facing roles.** Shorter digital print runs require the same amount of time to be spent working directly with customers to determine specifications, costing, billing etc. However, because fewer copies are produced, less time needs to be spent in the actual printing, binding and finishing of documents. This means that a greater proportion of workers time is likely to be devoted to customer facing functions.

- **Increased focus on quick turnaround.** Time frames are typically far shorter with digital printing compared to offset printing. This has led firms to offer rapid-turn around printing services, requiring workers to have precise time management and prioritisation skills.[49]

48 Queensland Government (2005) *Queensland Government Department of Public Works Phase 2 Report: Goprint*

49 Canon (2009) *Digital Printing Directions*, available at <http://www.canon.fr/Images/Insight_Report-v1_0_tcm79-612893.pdf>

Figure 10: Changes in print run length 2000 to 2020



Source: Canon (2009) *Digital Printing Directions*

On demand printing

Advancements in print technology are changing the structure of the book printing industry. Historically, books could only be produced cost-effectively if thousands of copies were produced. However, newer printing technology has made printing individual books more viable. This is giving rise to two new product categories:

- **Print on demand.** Book retailers and publishers are increasingly able to offer titles which are printed as customers order. Rather than holding a large inventory of titles which are infrequently purchased, retailers and publishers can hold digital copies of all titles and print books as orders are received. This enables retailers to both increase the size of their backlist as well as reduce costs of holding an inventory of titles which are infrequently purchased.[50]

- **Vanity publication.** Digital printing technology has also allowed the printing industry to offer low volume book publication services to individuals. Using digital print technology, it is possible to produce individual copies of books for customers such as hobbyists wishing to have their works published professionally.

These new service offerings are likely to require workers in the industry to deal increasingly with new types of customers. These may include small niche or technical publishers using print on demand services and individuals wishing to have their works published.

3D printing

3D printing (also referred to as additive manufacturing) is expected to become a key growth area within the economy, with the market for 3D printing equipment and services estimated to grow from US$2.5 billion in 2013 to US$16.2 billion in 2018.[51] One Australian technology specialist, Steve Sammartino, has predicted that 3D printing will have an even bigger impact on economies and society than the internet.[52]

The applications for 3D printing range across industries and traditional occupation roles. 3D printing draws on digital design, manufacturing, ICT and visual arts skills and has potential implications on all industries, from health to infrastructure to artistic expression. It is expected that applications will continue to be discovered as

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[50] The Conversation, Zoe Sadokierski (2014) *Shelf Promotion: how everyone can be a publisher with print-on-demand book,* available at < https://theconversation.com/shelf-promotion-how-everyone-can-be-a-publisher-with-print-on-demand-books-30923>

[51] PwC (2014) *The road ahead for 3-D printers,* available at <http://www.pwc.com/us/en/technology-forecast/2014/3d-printing/features/assets/pwc-3d-printing-full-series.pdf>

[52] Sarah Sedghi and Eleanor Hall (2015) *3D printing will have a bigger economic impact than the internet, technology specialist says, ABC News Online*

the technology becomes more widespread, but its potential can be seen in the uses already being explored. Examples include:

- **Changing the way that new products are developed**. For example, the use of 3D printing can reduce development time by up to 96 per cent and can produce products that are built in one part, reducing construction requirements and making complex components that cannot be made with conventional method.[53]

- **Exploration of medical implications**. Such as a 3D printed bioceramic implant to assist osteoarthritis sufferers,[54] or 3D printed heart models that can assist doctors in diagnosis and treatment planning,[55] and even the exploration of printing live cells.[56]

- **Expansion in to different printing mediums**. Including materials which can result in 4D printed objects, which are those that be respond to their environment, such as materials that respond to heat or moisture levels.[57]

Not all roles to do with 3D printing will be reskilling of the traditional printing and graphic arts sector, as the skills required are much more comprehensive. 'Actually translating your designs into physical objects takes more work and a broader skill set that requires a combination of maths, programming, art or design, materials science, and mechanical engineering'.[58]

However, the commercial printing industry is well positioned to capitalise on some parts of this growth by leveraging the same set of core competencies used in document printing. Many of the skills required to produce 3D printed objects are part of the key competencies held by workers in the commercial printing industry, namely:

- advising as to suitability of different production techniques, materials and substrates

- job costing

- preparation of digital files for printing (pre-print and pre-flighting)

- setup of complex machinery

- maintenance of machinery.

The commercial printing industry is also likely to have the scale needed to provide the significant capital outlay required to purchase higher quality, higher volume 3D printing equipment (with some higher quality 3D printing equipment ranging in price from $250,000 to $750,000).[59] This is likely to give the commercial printing industry both a cost and quality advantage over small scale desktop production, particularly in larger scale production runs of 3D printed objects.

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53 The Conversation (2013) *Can 3D printing rebuild manufacturing in Australia?*

54 3Ders (2016) *3D printed bioceramic implants for bone repair to enter market soon*, available at <http://www.3ders.org/articles/20160411-3d-printed-bioceramic-implants-for-bone-repair-to-enter-market-soon.html>

55 Bridget Butler Millsaps (2016) *Nothing short of amazing: The 3D printed heart library at jump trading center benefits everyone*, available at <https://3dprint.com/127777/3d-printed-heart-library/?>

56 Virginia Harrison (2015) *3-D printers could soon make human skin,* available at <http://money.cnn.com/2015/06/17/technology/3d-bioprinting-skin/>

57 Science Alert (2014) *4D printing create structures that self-assemble,* available at <http://www.sciencealert.com/watch-4d-printing-creates-structures-that-self-assemble>

58 The Conversation (2013) *Can 3D printing rebuild manufacturing in Australia?*

59 Australian Broadcasting Corporation (2014) *3D printing seen as manufacturing route for the future*, available at <http://www.abc.net.au/news/2014-10-13/3d-printing-seen-as-manufacturing-route-for-the-future/5807984>

In Australia, the concept of having dedicated 3D printing firms is not new with Australia's first dedicated 3D printing firm opened in Melbourne in 2014.[60] Konica Minolta Business Solutions Australia began offering both 3D printer sales and services in Australia in 2015.[61]

A lot is happening in the Print 3D space, biotechnology – we're now printing skin cells and bionic hands … it's an interesting, progressive and changing industry

Michelle Lees, Printing Industries Association of Australia

The Australian printing industry may look to capitalise upon the predicted growth in the 3D printing industry, however to do so, a skilled workforce with the necessary skills in 3D printing are likely to be required.

What does this mean for the printing and graphic arts sector workforce?

The continual and rapid evolution of printing processes and software means that workers in the industry are likely to need to adapt to ongoing technological change.

Job demand	• Workers will need to be able to shift jobs within the printing industry, as focus shifts towards digital printing and new printing market segments. • Increased jobs to support growing 3D printing industry.
Skills needs	• Up to date digital printing skills are a requirement for all graduates, as the industry moves towards a greater proportion of digital printing. • Workers in the printing industry need to be flexible and able to adapt to change and upskilling of current employees in new technologies may also be required. • Understanding of 3D printing technology and services.

60 Australian Broadcasting Corporation (2014) *3D printing seen as manufacturing route for the future*, available at <http://www.abc.net.au/news/2014-10-13/3d-printing-seen-as-manufacturing-route-for-the-future/5807984>

61 Konica Minolta (2015) *Konica Minolta enter 3D printing business by partnering with 3D Systems*, available at <https://www.konicaminolta.com.au/news/konica-minolta-enters-3d-printing-business-by-part>

Creating a future fit workforce

Using feedback from stakeholders and the data available, the IRC has identified five priority skills for the ICP Training Package (see Table 5). This list is an early assessment of the priority areas for development following an assessment of key trends and the state of the Training Package. It is recognised that these skills are cultivated to varying extents in the sector, but feedback suggests they are of ongoing critical importance.

Table 5: Priority skills in the printing and graphic arts sector

	Skill	Definition	Rationale
1	Industry knowledge	Understanding of the broad industry and trends, as well as the ability to research and absorb new information to keep up to date with industry trends.	• As highlighted in the trends analysis, different parts of the sector are contracting, growing or transforming in response to external factors. The future composition of the sector is expected to look different from the present composition. • As printing and graphic arts businesses refocus toward multi-channel marketing businesses, the occupation of a printing and graphic arts worker may be in a different looking organisation. Printers or graphic artists will not necessarily be expected to be data analysts or business managers, but an understanding of the broad sector and their place within that will be key to their success in this new environment. • This will include a general understanding of the growing use and importance of data in business decision making, recognising that there will be other more specialised occupation roles that will undertake this analysis. • Increased industry awareness of workers is likely to lead to adaptability and sustainability of the industry itself, allowing it to adapt to changes outlined in the trends shaping the sector.[62]
2	Career and development planning	Ability to plan one's own career (or own business) in a changing industry environment by self-assessing skills and planning development and progression.	• With the above knowledge of the industry, workers will also need the skills to self-assess and plan their own careers in this changing environment. • For lower skill level workers this is the ability to assess and find the best place for themselves in the market and at higher levels it is about creating that market for the service they can provide. • This will build upon industry knowledge and help identify the opportunities to diversify, as well as where there is a need for core printing services.

[62] Consultation with an IRC member

3	Creative, commercial and critical thinking	Ability to be creative and use problem solving skills in difficult situations.	• Although it may not be the case in all subsectors of the printing and graphic arts industry, IRC feedback suggests that many workers (including managers) in the sector do not have the skills to recognise problems, isolate the root-cause of that problem and then find and implement the solution. These core problem solving skills are important to any technician or manager working in the sector, however IRC feedback suggests that these skills are currently lacking in the Training Package. • With low turnover of staff and ideas, a skills gap is emerging in how the printing and graphic arts workforce can confidently pursue new options through testing and implementation. • These skills are not about the printing and graphic arts workforce taking on different roles but about being able to same roles better by bringing problem solving skills to technical expertise.
4	Collaboration and relationship building	Ability to build working relationships and collaborate within an organisation that may be broad ranging in its service offerings, but required different parts of the business to work together. This includes communication techniques for identifying and working with different personalities.	• These communication skills go hand in hand with industry knowledge and understanding to allow workers in the sector to operate to the best of their ability in changing environments. • As organisations in the sector begin to offer broader service offerings, workers will need to collaborate with the broader teams. • These skills are seen as particularly important to develop in the printing and graphic arts sector because of the static workforce and reputation of the industry. Ability to collaborate meaningfully feeds in to the values and culture of the sector. Strong interpersonal skills and ability to communicate the value of the sector will help to attract talent and change the standing of the sector.
5	Agility and flexibility	The ability to respond well to change and embrace new roles and technologies.	• Technology is changing the way that services are delivered. • Structural change in the sector means that ICP graduates will need adaptability and flexibility so that they can move seamlessly between sub-sectors or organisations that may not have their core business in the sector, but still require printing and graphic arts skills. • This agility will also include the ability to be autonomous and self-directing in a changing sector. • Changing technology and preferences is requiring workers in the printing and graphic arts sector to 'top-up' their skills to keep up to date with change. • Agility, together with problem solving skills, will make workers more open and able to understand new technologies, and their associated applications and benefits to their specific field. This will enable the sector to harness the possibilities of technological change.

In addition to skill priorities identified in this section, the IRC is required to rank a supplied list of 12 generic workforce skills (supplied by the Department) in order of importance to relevant employers. For the printing and graphic arts sector, these skills have been ranked below in Table 6.

All skills listed in Table 6 are important. Low ranking does not imply that the skill is not important, but rather lower ranking only indicates that these skills are not critical priorities for the printing and graphic arts sector. Further, Table 6 also only shows rankings of importance as an average across the whole sector, some skills may have higher or lower importance for particular organisations and particular sub-sectors. Note that these skills are read in line with definitions provided by the Department.

Table 6: Importance of generic workforce skills

Importance	Generic workforce skill
1	Learning agility / Information literacy / Intellectual autonomy and self-management
2	Customer service / Marketing
3	Design mindset / Thinking critically / System thinking / Solving problems
4	Technology
5	Entrepreneurial
6	Data analysis
7	Managerial / Leadership
8	Communication / Virtual collaboration / Social intelligence
9	Financial
10	Science, technology, engineering and maths (STEM)
11	Language, literacy and numeracy (LLN)
12	Environmental and sustainability

E. Other relevant skills-related insights for this sector

Not applicable, all skill needs and priority analysis is included above in Section D.

F. Training Product Review Plan

The Training Product Review Plan presents activities anticipated to be conducted through to June 2020. This section is structured into three parts:

- **Approach to scheduling the Training Product Review Plan**
- **Training Product Review Plan – 2016-17 to 2019-2020**
- **Rationale behind projects and scheduling in the Training Product Review Plan**

Approach to scheduling the Training Product Review Plan

Our mandate as an SSO to our IRCs, as set by the AISC, is to review all UoCs in the ICP Training Package within the four years from 2016-17 to 2019-20. UoCs are the basic building blocks of training in the VET system and are the basis of review funding. Therefore reviews will focus on UoC content, whilst also considering the packaging rules that make these UoCs in to qualifications and skill sets as relevant.

To schedule these reviews in a consistent way, principles were set for the two major decisions: **prioritisation** determines the review year and **project groupings** determines which UoCs will be reviewed together.

Prioritisation draws on content presented in previous sections of this Work Plan, such as trends shaping the sector and skills priorities, and are as follows:

- Training products issues identified by the IRC as needing immediate action are scheduled for review in the first year (2016-17).
- Training products issues identified by the IRC that were not raised as urgent are scheduled for review in the second year (2017-18).
- Training products that address emerging trends and growth needs are scheduled for review in the second and third years (2017-18 and 2018-19).
- Where a business case activity is scheduled, such as research and consultation to inform the review of certain training products, those training products are scheduled for review the year after the business case activity to ensure currency of the research.
- Training products not identified in the above scheduling principles are reviewed for currency in the final year (2019-20).
- How recently the training product was last reviewed is also taken into account.

Project grouping scheduling principles proposed are as follows:

- As much as practically possible, UoCs will be grouped so that they are reviewed only once in the four year period. However, there may be exceptions to this with a strong rationale for review in two projects.
- For simplicity and completeness, related Training Package content should be reviewed together. This could mean all the UoCs addressing the same subject matter or UoCs that are grouped to make a qualification. However, because different qualifications share UoCs, qualification based project grouping is likely to lead to duplication and so is not preferred without strong rationale.

The Training Product Review Plan will be revisited and reviewed in an ongoing manner, with a formal review and resubmission annually. This will allow the plan to respond to sector issues or emerging trends.

Training Product Review Plan – 2016-17 to 2019-20

Table 7 presents the Printing and Graphic Arts IRC Training Product Review Plan for 2016-17 to 2019-2020.

In a small Training Package, such as ICP, a significant proportion of UoCs are shared across several qualifications. Due to this, and because projects have been defined on a UoC basis, qualifications have not been included in the table below. However, as there are only eight qualifications in the Training Package, all four training product review projects are expected to involve all qualifications to some extent.

Table 7: Training Product Review Plan

Project code and name	Planned review start (year)	Training Package code	Training Package name	Qualification code	Qualification name	Unit of Competency code	Unit of Competency name
2a Establishing a competency framework by reviewing the structure of higher level qualifications	2016-17	ICP	Printing and Graphic Arts	N/A	N/A	N/A	N/A
2b Investigate the broader industry needs for 3D printing	2016-17	ICP	Printing and Graphic Arts	N/A	N/A	N/A	N/A
1a Review 3D printing units and skill set	2017-18	ICP	Printing and Graphic Arts	N/A	N/A	ICPPRN395	Set up and produce 3D print
						ICPPRP398	Set up and produce a 3D scan
						ICPPRP495	Manipulate 3D graphics files in preparation for 3D printing
						BSBDES303	Explore and apply the creative design process to 3D forms
						CUAANM302	Create 3D digital animations
						CUAANM303	Create 3D digital models
						CUAANM401	Create advanced 3D digital models
1b Review UoCs related to industry knowledge and priority employability skills	2017-18	ICP	Printing and Graphic Arts	N/A	N/A	ICPKNW322	Develop knowledge of the printing and graphic arts industry
						ICPSUP203	Prepare and maintain the work area
						ICPSUP216	Inspect quality against required standards
						ICPSUP260	Maintain a safe work environment
						ICPSUP261	Follow WHS practices and identify environmental hazards
						ICPSUP262	Communicate in the workplace
						ICPSUP263	Perform basic industry calculations
						ICPSUP271	Provide basic instruction for a task
						ICPSUP280	Enter data into electronic system
						ICPSUP281	Use computer systems
						ICPSUP345	Purchase materials and schedule deliveries
						ICPSUP351	Undertake basic production scheduling
						ICPSUP352	Plan operational processes
						ICPSUP357	Apply quick changeover procedures
						ICPSUP362	Communicate as part of a work team

Project code and name	Planned review start (year)	Training Package code	Training Package name	Qualification code	Qualification name	Unit of Competency code	Unit of Competency name
						ICPSUP381	Operate and maintain computer resources
						ICPSUP389	Undertake basic root cause analysis
						ICPSUP455	Supervise and schedule work of others
						ICPSUP456	Control production
						ICPSUP458	Monitor production workflow
						ICPSUP464	Provide customer service and education
						ICPSUP482	Troubleshoot and optimise materials and machinery
						ICPSUP485	Implement a Just-in-Time system
						ICPSUP486	Mistake proof a production process
						ICPSUP487	Analyse manual handling processes
						ICPSUP488	Ensure process improvements are sustained
						ICPSUP516	Set and apply quality standards
						ICPSUP553	Prepare production costing estimates
						ICPSUP554	Manage teams
						ICPSUP561	Implement and monitor WHS
						ICPSUP583	Troubleshoot and optimise the production process
						ICPSUP684	Determine and improve process capability
						AUMAQA001	Apply quality assurance techniques
						BSBCMM401	Make a presentation
						BSBCRT301	Develop and extend critical and creative thinking skills
						BSBCUS301	Deliver and monitor a service to customers
						BSBCUS401	Coordinate implementation of customer service strategies
						BSBCUS501	Manage quality customer service
						BSBFLM309	Support continuous improvement systems and processes
						BSBINN201	Contribute to workplace innovation
						BSBINN301	Promote innovation in a team environment
						BSBLDR403	Lead team effectiveness
						BSBMGT402	Implement operational plan
						BSBMGT403	Implement continuous improvement
						BSBMGT407	Apply digital solutions to work processes
						BSBMGT516	Facilitate continuous improvement
						BSBMGT517	Manage operational plan
						BSBMGT519	Incorporate digital solutions into plans and practices
						BSBMGT608	Manage innovation and continuous improvement
						BSBPMG409	Apply project scope management techniques
						BSBPRO401	Develop product knowledge
						BSBREL401	Establish networks
						BSBREL402	Build client relationships and business networks
						BSBSMB301	Investigate micro business opportunities
						BSBSMB402	Plan small business finances
						BSBSMB403	Market the small business
						BSBSMB404	Undertake small business planning
						BSBSMB412	Introduce cloud computing into business operations
						BSBSUS201	Participate in environmentally sustainable work practices
						BSBSUS401	Implement and monitor environmentally sustainable work practices
						BSBSUS501	Develop workplace policy and procedures for sustainability

Project code and name	Planned review start (year)	Training Package code	Training Package name	Qualification code	Qualification name	Unit of Competency code	Unit of Competency name
						BSBWOR301	Organise personal work priorities and development
						BSBWOR404	Develop work priorities
						BSBWOR501	Manage personal work priorities and professional development
						BSBWOR502	Lead and manage team effectiveness
						CUAPPR401	Realise a creative project
						MSACMT270A	Use sustainable energy practices
						MSACMT271A	Use sustainable environmental practices
						MSAENV272B	Participate in environmentally sustainable work practices
						MSAENV472B	Implement and monitor environmentally sustainable work practices
						MSAPMSUP390A	Use structured problem solving tools
						MSL933001A	Maintain the laboratory/field workplace fit for purpose
						MSL954001A	Obtain representative samples in accordance with sampling plan
						MSL973002A	Prepare working solutions
						MSL974001A	Prepare, standardise and use solutions
						MSS402001A	Apply competitive systems and practices
						MSS402002A	Sustain process improvements
						MSS402010A	Manage the impact of change on own work
						MSS402030A	Apply cost factors to work practices
						MSS402040A	Apply 5S procedures
						MSS402080A	Undertake root cause analysis
						MSS403010A	Facilitate change in an organisation implementing competitive systems and practices
						MSS403040A	Facilitate and improve implementation of 5S
						MSS405021A	Develop a Just in Time system
						SIRXCCS006A	Maintain business to business relationships
						SIRXCCS509	Manage business customers
						TAEASS402A	Assess competence
						TAEDEL402A	Plan, organise and facilitate learning in the workplace
1c Review design, marketing and other pre-press technical UoCs	2018-19	ICP	Printing and Graphic Arts	N/A	N/A	ICPDMT263	Access and use the internet
						ICPDMT296	Create and test an interactive CD-ROM/DVD
						ICPDMT321	Capture a digital image
						ICPDMT322	Edit a digital image
						ICPDMT344	Manipulate and incorporate audio into multimedia presentations
						ICPDMT346	Incorporate video into multimedia presentations
						ICPDMT491	Create an extensible document
						ICPDMT492	Create an extensible style sheet
						ICPDMT581	Manage multimedia production
						ICPDMT582	Manage multimedia projects
						ICPINK211	Select and prepare materials for production
						ICPINK221	Blend chemicals
						ICPINK251	Filter and pack product
						ICPINK331	Manufacture inks and coatings
						ICPINK335	Manufacture varnish and resin
						ICPPRP211	Develop a basic design concept
						ICPPRP221	Select and apply type
						ICPPRP223	Photograph a line image
						ICPPRP224	Produce pages using a page layout application

Project code and name	Planned review start (year)	Training Package code	Training Package name	Qualification code	Qualification name	Unit of Competency code	Unit of Competency name
						ICPPRP225	Produce graphics using a graphics application
						ICPPRP231	Manually combine spot colour and basic four-colour images
						ICPPRP232	Electronically combine and assemble data
						ICPPRP252	Output images
						ICPPRP260	Proof images
						ICPPRP266	Produce relief plates
						ICPPRP267	Produce offset lithographic plates
						ICPPRP268	Make photopolymer plates (flexographic)
						ICPPRP269	Produce photopolymer plates for pad printing
						ICPPRP272	Produce gravure cylinders manually
						ICPPRP281	Design basic carton
						ICPPRP283	Prepare artwork for screen printing
						ICPPRP284	Produce PDF files for online or screen display
						ICPPRP285	Scan a mono image
						ICPPRP286	Scan images for reproduction
						ICPPRP311	Develop a detailed design concept
						ICPPRP321	Produce a typographic image
						ICPPRP322	Digitise images for reproduction
						ICPPRP323	Photograph and produce halftone images
						ICPPRP324	Create pages using a page layout application
						ICPPRP325	Create graphics using a graphics application
						ICPPRP331	Manually combine complex four-colour images
						ICPPRP333	Electronically combine complex images
						ICPPRP334	Prepare an imposition format for printing processes
						ICPPRP352	Output complex images
						ICPPRP360	Undertake special colour proofing
						ICPPRP370	Produce multiple image plates
						ICPPRP372	Produce gravure cylinders electronically
						ICPPRP382	Produce computer image for screen printing
						ICPPRP385	Operate a database for digital printing
						ICPPRP386	Undertake digital proofing
						ICPPRP396	Generate high-end PDF files
						ICPPRP397	Transfer digital files
						ICPPRP411	Undertake a complex design brief
						ICPPRP421	Compose and evaluate typography
						ICPPRP422	Digitise complex images for reproduction
						ICPPRP423	Apply colour to design brief
						ICPPRP430	Manage colour
						ICPPRP435	Generate complex imposition
						ICPPRP452	Output complex images direct to plate or press
						ICPPRP481	Design complex carton
						ICPPRP484	Set up and operate automated workflow
						ICPPRP485	Develop a digital data template
						ICPPRP494	Develop document content and structure
						ICPSCP382	Produce computer image for screen printing
						ICPSUP211	Prepare ink and additives

Project code and name	Planned review start (year)	Training Package code	Training Package name	Qualification code	Qualification name	Unit of Competency code	Unit of Competency name
						ICPSUP212	Prepare coatings and adhesives
						ICPSUP311	Prepare ink and additives (advanced)
						BSBDES301	Explore the use of colour
						BSBDES302	Explore and apply the creative design process to 2D forms
						BSBDES305	Source and apply information on the history and theory of design
						BSBDES401	Generate design solutions
						BSBDES402	Interpret and respond to a design brief
						BSBDES403	Develop and extend design skills and practice
						BSBDES601	Manage design realisation
						BSBEBU501	Investigate and design e-business solutions
						BSBEBU502	Implement e-business solutions
						BSBIPR401	Use and respect copyright
						BSBIPR601	Develop and implement strategies for intellectual property management
						BSBITU306	Design and produce business documents
						BSBMKG401	Profile the market
						BSBMKG412	Conduct e-marketing communications
						BSBMKG413	Promote products and services
						BSBMKG501	Identify and evaluate marketing opportunities
						BSBSLS407	Identify and plan sales prospects
						BSBSLS408	Present, secure and support sales solutions
						BSBSLS501	Develop a sales plan
						CUAACD101	Use basic drawing techniques
						CUAACD201	Develop drawing skills to communicate ideas
						CUAACD401	Integrate colour theory and design processes
						CUAANM301	Create 2D digital animations
						CUAANM403	Create titles for screen productions
						CUAANM503	Design animation and digital visual effects
						CUACMP301	Implement copyright arrangements
						CUADIG201	Maintain interactive content
						CUADIG301	Prepare video assets
						CUADIG302	Author interactive sequences
						CUADIG304	Create visual design components
						CUADIG401	Author interactive media
						CUADIG402	Design user interfaces
						CUADIG403	Create user interfaces
						CUADIG404	Apply scripting language in authoring
						CUADIG405	Produce innovative digital images
						CUADIG501	Coordinate the testing of interactive media products
						CUADIG502	Design digital applications
						CUADIG503	Design e-learning resources
						CUADIG504	Design games
						CUADIG505	Design information architecture
						CUAGRD301	Prepare files for publication
						CUAGRD302	Use typography techniques
						CUAGRD401	Research and apply graphic design techniques
						CUAGRD504	Create and manipulate graphics

Project code and name	Planned review start (year)	Training Package code	Training Package name	Qualification code	Qualification name	Unit of Competency code	Unit of Competency name
						CUAGRD505	Design and manipulate complex layouts
						CUAPHI513	Employ colour management in a digital imaging workplace
						CUAPHI514	Prepare digital images for pre-press processing
						ICTDBS504	Integrate database with a website
						ICTNWK301	Provide network systems administration
						ICTNWK302	Determine and action network problems
						ICTNWK303	Configure and administer a network operating system
						ICTNWK304	Administer network peripherals
						ICTNWK305	Install and manage network protocols
						ICTNWK401	Install and manage a server
						ICTNWK402	Install and configure virtual machines for sustainable ICT
						ICTNWK403	Manage network and data integrity
						ICTNWK404	Install, operate and troubleshoot a small enterprise branch network
						ICTNWK405	Build a small wireless local area network
						ICTNWK406	Install, configure and test network security
						ICTNWK407	Install and configure client-server applications and services
						ICTNWK408	Configure a desktop environment
						ICTNWK409	Create scripts for networking
						ICTNWK410	Install hardware to a network
						ICTNWK411	Deploy software to networked computers
						ICTNWK412	Create network documentation
						ICTNWK414	Create a common gateway interface script
						ICTNWK416	Build security into virtual private networks
						ICTNWK417	Build an enterprise wireless network
						ICTNWK418	Implement backbone technologies in a local area network
						ICTWEB401	Design a website to meet technical requirements
						ICTWEB402	Confirm accessibility of websites for people with special needs
						ICTWEB403	Transfer content to a website using commercial packages
						ICTWEB404	Maintain website performance
						ICTWEB405	Monitor traffic and compile website traffic reports
						ICTWEB406	Create website testing procedures
						ICTWEB407	Conduct operational acceptance tests of websites
						ICTWEB408	Ensure basic website security
						ICTWEB409	Develop cascading style sheets
						ICTWEB410	Apply web authoring tool to convert client data for websites
						ICTWEB411	Produce basic client-side script for dynamic web pages
						ICTWEB412	Produce interactive web animation
						ICTWEB413	Optimise search engines
						ICTWEB414	Design simple web page layouts
						ICTWEB415	Produce server-side script for dynamic web pages
						ICTWEB416	Customise content management system
						ICTWEB417	Integrate social web technologies
						ICTWEB418	Use development software and ICT tools to build a basic website
						ICTWEB419	Develop guidelines for uploading information to a website
						ICTWEB420	Write content for web pages
						ICTWEB421	Ensure website content meets technical protocols and standards

Project code and name	Planned review start (year)	Training Package code	Training Package name	Qualification code	Qualification name	Unit of Competency code	Unit of Competency name
						ICTWEB422	Ensure website access and useability
						ICTWEB423	Ensure dynamic website security
						ICTWEB424	Evaluate and select a web hosting service
						ICTWEB425	Apply structured query language to extract and manipulate data
						ICTWEB429	Create a markup language document to specification
						ICTWEB502	Create dynamic web pages
						ICTWEB510	Analyse information and assign meta tags
						SIRXSLS002A	Advise on products and services
						SIRXSLS008A	Develop a sales strategy
						SIRXSLS201	Sell products and services
						SIRXSLS406	Manage sales and service delivery
1d Review print and post-press technical UoCs	2019-20	ICP	Printing and Graphic Arts	N/A	N/A	ICPCBF105	Operate in-line mail machine
						ICPCBF202	Handline mail
						ICPCBF203	Collate and insert mail manually
						ICPCBF204	Operate addressing machine
						ICPCBF208	Set up and operate a cheque mailer machine
						ICPCBF209	Set up and operate in-line mail machine
						ICPCBF211	Set up and run machine for sewing
						ICPCBF214	Set up single-faced web
						ICPCBF216	Set up double-faced web
						ICPCBF218	Produce basic folded and glued cartons
						ICPCBF220	Produce basic converted or finished product
						ICPCBF221	Set up and produce basic guillotined product
						ICPCBF222	Set up and operate in-line cutter
						ICPCBF223	Set up machine for cutting (trimming)
						ICPCBF224	Produce cut (trimmed) product
						ICPCBF225	Set up machine for basic flat-bed die cutting or embossing
						ICPCBF226	Produce basic flat-bed die cut or embossed product
						ICPCBF227	Set up machine for basic rotary die cutting or embossing
						ICPCBF228	Produce basic rotary die cut or embossed product
						ICPCBF231	Set up machine for basic flat-bed cutting
						ICPCBF232	Produce basic flat-bed cut product
						ICPCBF235	Set up machine for basic rotary cutting
						ICPCBF236	Produce basic rotary cut product
						ICPCBF241	Set up machine for basic single or continuous folding
						ICPCBF242	Produce basic single or continuous folded product
						ICPCBF243	Set up machine for basic collating or inserting (sheet/section)
						ICPCBF244	Produce basic collated or inserted (sheet/section) product
						ICPCBF245	Set up and produce hand-collated or inserted product
						ICPCBF261	Set up machine for basic adhesive, mechanical or thermal fastening
						ICPCBF262	Produce basic adhesive, mechanical or thermal fastened product
						ICPCBF263	Set up and produce hand-fastened product
						ICPCBF281	Set up machine for basic laminating
						ICPCBF282	Produce basic laminated product
						ICPCBF294	Set up profile cutting for envelope manufacture
						ICPCBF297	Clean sack and bag machines

Project code and name	Planned review start (year)	Training Package code	Training Package name	Qualification code	Qualification name	Unit of Competency code	Unit of Competency name
						ICPCBF298	Run and monitor sack and bag machines
						ICPCBF300	Run and monitor in-line tube making machine for sack or bag manufacture
						ICPCBF301	Run and monitor in-line bottom making machine for sack or bag manufacture
						ICPCBF302	Set up and monitor in-line scoring, folding and gluing machine for sack or bag manufacture
						ICPCBF303	Run and monitor envelope manufacturing machines
						ICPCBF305	Produce single-faced web
						ICPCBF306	Set up machine for basic carton folding and gluing
						ICPCBF307	Produce double-faced web
						ICPCBF309	Produce complex folded and glued cartons
						ICPCBF311	Prepare for cutting forme and stripper making
						ICPCBF312	Set cutting forme and strippers
						ICPCBF320	Produce complex converted or finished product
						ICPCBF321	Set up and produce complex guillotined product
						ICPCBF326	Undertake pre make-ready for die cutting
						ICPCBF327	Set up machine for complex rotary die cutting or embossing
						ICPCBF328	Produce complex rotary die cut or embossed product
						ICPCBF341	Set up machine for complex sequenced or multiple folding
						ICPCBF342	Produce complex sequenced or multiple folded product
						ICPCBF343	Set up machine for complex collating or inserting (sheet/section/reel)
						ICPCBF344	Produce complex collated or inserted product
						ICPCBF361	Set up machine for complex adhesive, mechanical or sewn fastening
						ICPCBF362	Produce complex adhesive, mechanical or sewn fastened product
						ICPCBF369	Set up and produce hand-made box
						ICPCBF371	Decorate paper
						ICPCBF381	Set up machine for complex laminating
						ICPCBF382	Produce complex laminated product
						ICPCBF391	Use electronic monitoring systems (converting and finishing)
						ICPCBF392	Produce product on window gluer
						ICPCBF393	Set up machine for envelope manufacture
						ICPCBF395	Set up and operate folder gluer machine
						ICPCBF396	Set up in-line scoring, folding and gluing machine for envelope manufacture
						ICPCBF398	Set up in-line bottom making machine for sack or bag manufacture
						ICPCBF399	Set up in-line tube making machine for sack or bag manufacture
						ICPCBF406	Set up and load in-line smart card machine
						ICPCBF407	Operate a smart card machine and pack product
						ICPCBF410	Set up machine for complex carton folding and gluing
						ICPCBF425	Set up machine for complex flat-bed die cutting or embossing
						ICPCBF426	Produce complex flat-bed die cut or embossed product
						ICPCBF465	Set up and produce hand-bound book
						ICPCBF467	Restore books
						ICPPRN211	Mount and proof flexographic plates for basic printing
						ICPPRN214	Produce basic flexographic printed product
						ICPPRN222	Produce basic gravure printed product
						ICPPRN232	Produce basic lithographic printed product
						ICPPRN242	Produce basic pad printed product

Project code and name	Planned review start (year)	Training Package code	Training Package name	Qualification code	Qualification name	Unit of Competency code	Unit of Competency name
						ICPPRN261	Set up for foil stamping
						ICPPRN262	Produce foil stamped product
						ICPPRN271	Set up for basic coating
						ICPPRN272	Produce basic coated product
						ICPPRN282	Produce and manage basic digital print
						ICPPRN283	Use digital media consumables
						ICPPRN284	Use colour management systems
						ICPPRN285	Use digital workflow
						ICPPRN286	Finish a digital product
						ICPPRN287	Use digital processes
						ICPPRN288	Produce basic relief printed product
						ICPPRN313	Set up for basic flexographic printing
						ICPPRN314	Produce complex flexographic printed product
						ICPPRN321	Set up for basic gravure printing
						ICPPRN322	Produce complex gravure printed product
						ICPPRN331	Set up for basic lithographic printing
						ICPPRN332	Produce complex lithographic printed product
						ICPPRN341	Set up for basic pad printing
						ICPPRN342	Produce complex pad printed product
						ICPPRN382	Produce and manage complex digital print
						ICPPRN383	Prepare for personalised digital printing
						ICPPRN384	Set up and produce basic digital print
						ICPPRN385	Apply software applications to digital production
						ICPPRN386	Troubleshoot digital media
						ICPPRN387	Use colour management for production
						ICPPRN388	Preflight and import complex images for digital devices
						ICPPRN389	Manage digital files
						ICPPRN390	Generate a proof for digital production
						ICPPRN392	Set up and produce specialised digital print
						ICPPRN393	Set up for basic relief printing
						ICPPRN394	Produce complex relief printed product
						ICPPRN411	Mount and demount flexographic plates for complex printing
						ICPPRN413	Set up for complex flexographic printing
						ICPPRN414	Produce specialised flexographic printed product
						ICPPRN421	Set up for complex gravure printing
						ICPPRN422	Produce specialised gravure printed product
						ICPPRN431	Set up for complex lithographic printing
						ICPPRN432	Produce specialised lithographic printed product
						ICPPRN441	Set up for complex pad printing
						ICPPRN442	Produce specialised pad printed product
						ICPPRN451	Set up for complex relief printing
						ICPPRN452	Produce specialised relief printed product
						ICPPRN471	Set up for complex coating
						ICPPRN472	Produce complex coated product
						ICPPRN484	Prepare for variable data printing
						ICPPRN491	Use on-press monitoring of print quality

Project code and name	Planned review start (year)	Training Package code	Training Package name	Qualification code	Qualification name	Unit of Competency code	Unit of Competency name
						ICPPRN492	Use on-press print control devices
						ICPPRN493	Set up and monitor in-line printing operations
						ICPPRN494	Apply advanced software applications to digital production
						ICPPRN495	Set up and use complex colour management for production
						ICPPRN496	Set up and produce complex digital print
						ICPPRN497	Work with digital information
						ICPPRN498	Adapt digital content for publication on different devices
						ICPPRN513	Set up for specialised flexographic printing
						ICPPRN521	Set up for specialised gravure printing
						ICPPRN531	Set up for specialised lithographic printing
						ICPPRN541	Set up for specialised pad printing
						ICPPRN551	Set up for specialised relief printing
						ICPPRN552	Manage digital workflow
						ICPSCP211	Reclaim screen automatically
						ICPSCP215	Prepare screen
						ICPSCP221	Prepare substrate
						ICPSCP222	Prepare and cut screen print substrate
						ICPSCP233	Manually prepare direct emulsion stencil
						ICPSCP235	Prepare stencil using photographic indirect method
						ICPSCP270	Manually prepare and produce screen prints
						ICPSCP271	Manually produce basic screen prints
						ICPSCP273	Semi-automatically produce basic screen prints
						ICPSCP275	Automatically produce basic screen prints
						ICPSCP281	Finish screen print products
						ICPSCP282	Prepare film for basic screen printing
						ICPSCP311	Reclaim screen manually
						ICPSCP333	Automatically prepare direct emulsion stencil
						ICPSCP337	Prepare stencil using photographic capillary method
						ICPSCP339	Prepare stencil using direct projection method
						ICPSCP341	Prepare stencil using direct electronic imaging method
						ICPSCP351	Prepare machine and drying/curing unit
						ICPSCP371	Manually produce complex screen prints
						ICPSCP373	Semi-automatically produce complex screen prints
						ICPSCP374	Operate a semi-automatic screen printing machine
						ICPSCP375	Automatically produce complex screen prints
						ICPSCP376	Operate an automatic screen printing machine
						ICPSCP383	Prepare film for complex screen printing
						ICPSUP120	Pack product
						ICPSUP201	Prepare, load and unload reels and cores on and off machine
						ICPSUP202	Prepare, load and unload product on and off machine
						ICPSUP207	Prepare machine for operation (basic)
						ICPSUP208	Operate and monitor machines (basic)
						ICPSUP221	Pack and dispatch product
						ICPSUP222	Pack and dispatch solid waste
						ICPSUP235	Lift loads mechanically
						ICPSUP236	Shift loads mechanically

Project code and name	Planned review start (year)	Training Package code	Training Package name	Qualification code	Qualification name	Unit of Competency code	Unit of Competency name
						ICPSUP241	Undertake warehouse or stores materials processing
						ICPSUP243	Reconcile process outputs
						ICPSUP282	Undertake basic machine maintenance
						ICPSUP321	Pack and dispatch (advanced)
						ICPSUP323	Dispose of waste
						ICPSUP342	Undertake inventory procedures
						ICPSUP417	Perform laboratory quality tests of materials and finished product
						MSL973001A	Perform basic tests
						TLIA2041A	Manually sort mail and parcels
						TLIA2043A	Consolidate mail
						TLIA2047A	Stream mail
						TLIW3006A	Operate computerised mail and parcels sorting equipment

Rationale behind projects and scheduling in the Training Product Review Plan

The Department has advised that the AISC will use the recommendations made by all IRCs, together with an analysis of the relevant Work Plans, to develop a national schedule of all UoCs across Training Packages. In developing this schedule, the AISC will consult the IRC Work Plan, taking account of: regulatory need, strategic industry and government priorities, economic impact, current levels of VET activity, risk, and available budget. To assist the AISC develop this schedule, rationales have been written to support the scope, content and timing of these projects, drawing on the above factors where relevant. Table 8 presents a summary of these rationales for each project.

Table 8: Rationales for projects

Item code	Year	Title	Rationale
2a	2016-17 (IRC to submit business case in Year 1)	Establishing a competency framework by reviewing the structure of the ICP training package and the uptake and application of the higher level qualifications	The printing and graphic arts sector is facing a fast approaching workforce challenge. This has been driven by a perception that the sector is in decline, based on the performance of some products, particularly print media as highlighted in section D. However, this perception stems from a misunderstanding of core printing services and products which include customised promotional and marketing materials, packaging products and consumer products. Printed products are demanded by other industries in the economy, particularly retail and food manufacturing. These industries require a variety of printing products and services as part of ongoing business, but also represent opportunities for growth such as unique labelling requirements for food exports. With many sectors of the economy relying on printing and graphic arts products and services, the emerging skills gap due to a static and ageing workforce are of particular concern (as discussed in section B). If the perception of the sector cannot be changed to induce more young learners in to training, when the current cohort retires, the resulting employment gap may means the sector is not able to deliver core services or have workers skilled to innovate and capitalise on growth opportunities. This emerging skill gap is of more concern when the current structure of the ICP Training Package is examined. Analysis of other training available for the workforce (see Appendix B) show that there are few available substitutes for VET in this sector (although vendor training retains an important for of upskilling on top of ICP qualifications). However, despite this importance, there are concerns that the current Training Package is not structured correctly to reflect pathways and encourage workers to enter the sector. Training and employment in the sector is currently built around entry level apprenticeships at a Certificate III level and there is not a culture of continuous training through formal mechanisms such as higher levels of vocational training. Therefore, there is some confusion as to what occupational outcomes the other levels of qualifications (particularly Certificate IV and Diploma) are targeting. This is clearly shown in only 3 per cent of 2014 enrolments being in Certificate IV or Diploma ICP qualifications.[63] This is a clear structural problem with the Training Package. The IRC believes that this Training Package structure issue has flowed from that training in the sector has no competency framework to build skill requirements on. This lack of established competency framework has led to issues in the structure, content, packaging and delivery in training, which is in turn exacerbated by the reputation of the sector to lead to a critical emerging skill gap. Without a thorough and considered establishment of such a framework, all future training product review will only be able to make marginal improvements and not address these underlying issues, to the detriment of the sector's future. Therefore, this project will work directly with employers, trainers and industry experts to establish this competency framework and allow future training product review to actually address these structural issues. Although this training product review plan presents four years of review, it is expected that this may be revised after the completion of this activity, as the outcome will drive all training review in the future.

[63] NCVER (2014) *Total VET Activity*

2b	2016-17 (IRC to submit business case in Year 1)	Investigate the broader industry needs for 3D printing	As outlined in section D of this report and in discussions with IRC members and a 3D printing industry group, 3D printing is a key emerging technology that has the capacity to impact many sectors across the economy, from printing and manufacturing to health and computing. Some UoCs were recently added to ICP after an initial 3D printing review, but it is recognised that training may be required much more broadly and this IRC cannot accurately address all those broad industry training needs. 3D printing is a key government priority because of its ability to impact all sectors. A recent PwC report found 3D printing to be one of the top eight technologies to have the most cross-industry worldwide impact in the near future.[64] Input is required from a much broader set of employers and industry participants to understand how their industry is using 3D printing and what their particular skill needs and training requirements are. There also needs to be investigation in to where this training best fits, particularly regarding manufacturing overlap with the Manufacturing and Engineering Training Package (MEM) and the Manufacturing Training Package (MSM) and design overlap with the Creative Arts and Culture Training Package (CUA). Accordingly, this project will be undertaken in close collaboration with other IRCs and SSOs so as to foster cross-sector use of 3D printing training products and cross-sector collaboration in their development. This project will investigate these issues and draw conclusions of appropriateness of training product review projects for the future and will be undertaken in collaboration with other IRCs and SSOs.
1a	2017-18 (not yet submitted)	Review 3D printing units and skill set	As discussed in section D of this report and in discussions with IRC members and a 3D printing industry group, 3D printing is a key emerging technology that has untapped potential in a variety of industries and therefore many VET Training Packages. This is why the business case activity *investigate the broader industry needs for 3D printing* has been scheduled for 2016-17. The cross sector impact that is the impetus for that project does raise questions of where training for these skills may best fit, which means that any review of the existing units should emphasise exportability and the needs of employers across all sectors. The business case activity will investigate the particular 3D printing skill needs and training requirements of a variety of industries, and draw conclusions of what future training product review will be appropriate. This review may include amendments to, or consolidation of, current UoCs, as well as the creation of new UoCs. The review will aim to ensure usability of the training content in other sectors, as well as ensure that the benefits of the training can easily be communicated to ensure appropriate import uptake in to other Training Packages.

64 PwC (2016) *Tech breakthroughs megatrend: how to prepare for its impact,* available at <https://www.pwc.com/gx/en/issues/technology/tech-breakthroughs-megatrend.pdf>

1b	2017-18 (not yet submitted)	Review UoCs related to industry knowledge and priority employability skills	As discussed in section B of this report, the printing and graphic arts sector is acknowledged to be an often challenging, and constantly changing, sector to work in. The working conditions can take its toll on workers, and the market adjustments and technological change can strongly impact organisations not able to adapt to them. Consequently, all the identified priority skills for a future fit workforce relate to workers being able to thrive in this challenging environment. As highlighted in Section D, changes needed to support the future workforce include increasing their industry knowledge and developing a professionalised skill set such as career and development planning, creative, commercial and critical thinking, collaboration and relationship building and agility and flexibility (including, at higher skills levels, the ability to manage and teach others these skills). A lack of these sort of skills have been raised by IRC members as a concern, reflected in some industry performance. Feedback from IRC members suggests that the current Training Package is not delivering these skills well as there are limited units available to address them and those that are available are predominantly imported UoCs that may not nuanced enough to the challenged of the printing and graphic arts sector. Particularly lacking is any training content that directly builds learners knowledge of the sector and the trends and economy forces affecting it, and how it is adapting. Given that this review addresses these priority areas and stakeholder concerns it is scheduled as a priority for 2017-18. The review will examine the appropriateness and adaptability of all native and imported UoCs currently addressing these skills, as well as where they sit in packaging rules in different qualifications. This review may include amendments to, or consolidation of, current UoCs and/or the creation of new UoCs that may be more specialised to this sector. As discussed above, this project is only preliminarily scheduled and the business case activity, *Establishing a competency framework by reviewing the structure of the ICP training package and the uptake and application of the higher level qualifications*, is expected to strongly influence the next three years of training product review, including the composition and focus of this review.
1c	2018-19 (not yet submitted)	Review design, marketing and other pre-press technical UoCs	Design and marketing skills, along with technical pre-press competencies, represent the technical skills required from a worker prior to actual printing. This Work Plan has highlighted in Section D that as the market adjusts, there may be an increased (and changing) emphasis on these skills, as printing organisations work to increase their offerings by including more design and marketing strategy prior to printing. Given that this review addresses this emerging trend it is scheduled as a priority for 2018-19. However, as discussed above, this project is only preliminarily scheduled and the business case activity, *Establishing a competency framework by reviewing the structure of the ICP training package and the uptake and application of the higher level qualifications*, is expected to strongly influence the next three years of training product review, including the composition and focus of this review. The review will examine the appropriateness and adaptability of all native and imported UoCs currently addressing these skills, as well as where they sit in packaging rules in different qualifications. It is likely that this review will have a refining and consolidation focus due to the large amount of UoCs currently available, although it may include amendments to, or consolidation of, current UoCs and/or the creation of new UoCs.

1d	2019-20 (not yet submitted)	Review print and post-press technical UoCs	Printing and post-press technical skills are clearly core to the printing and graphic arts sector and are essential to all workers (though available in many specialities). Through consultations with the IRC and analysis in this report, we have not identified a current strong impetus for review of the technical print and post-press UoCs in the first three years of Training Package Development. Strong rationales for review in the first three years include stakeholder concerns with current training or trends disrupting skills needs thus requiring a training update. Given the absence of stakeholder concerns or sector changes, the technical print and post-press UoCs will be reviewed in 2019-20. However, as discussed above, this project is only preliminarily scheduled and the business case activity, *Establishing a competency framework by reviewing the structure of the ICP training package and the uptake and application of the higher level qualifications*, is expected to strongly influence the next three years of training product review, including the composition and focus of this review. This review will examine all UoCs for currency including updating for technical or best practice advances where necessary. It is likely that this review will have a refining and consolidation focus due to the large amount of UoCs currently available, although it may include amendments to, or consolidation of, current UoCs and/or the creation of new UoCs.

G. IRC signoff

This Work Plan was agreed to by:

Bill Healey

Chair

Printing and Graphic Arts IRC

29/09/2016

Appendix A Occupation classifications

Defining and classifying occupations can be difficult in any sector. In the vocational education and training context, using classifications that are too general can lose the nuance of skill levels or technical details acquired in each qualification, however, using classifications that are too specific can make general trends identification or commentary impossible.

This Work Plan largely draws on terminology used in the Training Package, as published in Printing and Graphic Arts Training Package, version 2.0.Table 9 sets out the following classifications:

- Australia and New Zealand Standard Classification of Occupations (ANZSCO) developed by the ABS. These occupations have been mapped to qualifications by NCVER and are used for Department of Employment forecast projections. Therefore ABS and NCVER research data is consistent with ANZSCO definitions. The limitation of these definitions is that they are somewhat narrow and therefore may not be an accurate representation of all parties within the sector.
- Taxonomy developed by the former ISCs, mapped to qualifications in Training Packages to occupations. However, these occupations are not mapped to ABS or NCVER data collection, and therefore do not provide any quantitative information as to the size of the workforce.

Table 9: Different occupation classifications

Qualification	ANZSCO mapping	Taxonomy mapping
Certificate II in Printing and Graphic Arts (General)	Printer's Assistant	Assistant Machinist (Printing); Carton and Corrugating Machinist; Desktop Publishing Assistant; Print Finishing Operator; Pre-Press Worker; Carton and Corrugating Machine Operator; Mail House Operator; Printing Operator; Ink Mixer; Sack/Bag Maker; Screen Printing Assistant; Digital Print Operator; Print Offsider
Certificate III in Print Manufacturing	Not available	Carton and Corrugating Machine Operator; Sack/Bag Maker; Mail House Team Leader; Printing Operator; Mail House Operator; Print Finishing Operator; Ink Manufacturing Technician; Print Machinist; Mail House Production Supervisor; Ink Mixer; Sack/Bag Machinist; Press Operator
Certificate III in Print Communications	Not available	Digital Production Controller; Multimedia Designer; Pre-Press Worker; Graphic Designer; Multimedia Production Technician; Pre-Press Operator; Pre-Press Technician; Multimedia Content Author; Print Finishing Artist; Assistant Graphic Artist; Digital Media Designer; Multimedia Developer; Multimedia Graphic Designer
Certificate III in Printing	Not available	Screen Printer; Printing Operator; Print Machinist; Offset Printer; Printing Supervisor
Certificate IV in Printing and Graphic Arts (Mail House)	Print Finisher	Mail House Production Supervisor
Certificate IV in ePublishing	Graphic Pre-Press Trades Worker	Desktop Publisher; Desktop Publishing Assistant
Certificate IV in Printing and Graphic Arts	Print Finisher	Binder and Finisher; Pre-Press Technician; Production Controller (Printing Industry); Binding and Finishing Technician
Diploma of Printing and Graphic Arts	Printers*	Multimedia Designer; Production Supervisor (Printing Industry); Production Controller (Printing Industry); Specialist Print Technologist; Digital Production Controller; Multimedia Graphic Designer

Source: Australian Government (2016) *ICP Printing and Graphic Arts Training Package, Release 2.0*
* Note: Diploma of Printing and Graphic Arts is incorrectly mapped to a higher ANZSCO level (four digit level) "Printer" – includes two six digit level occupations – Printing Machinist and Small Offset Printer

Appendix B VET and other training in the sector

Australians wishing to acquire new skills in the business services sector can choose from many education and training options, varying from formal training to on the job learning. Factors driving the decision to enrol in VET, rather than take an alternative learning pathway, include funding availability, reputation and quality of the training, the learner's previous education and experience, and employer preferences.

Part of principled training product review is to understand how the ICP Training Package is used to skill learners, to excel in the printing and graphic arts sector, then design training accordingly. A thorough understanding of the training landscape helps us answer two questions important to Training Package design:

- Why are learners choosing to enrol in qualifications and courses in the ICP Training Package over other training, both now and into the future?
- Will changes to the ICP Training Package fill a training gap or provide better accessibility of training compared to other options?

Important dynamics to consider include the substitutability and competition (influenced by funding and availability) of the options, the relevance of the different forms of training to particular sub-sectors, and employer preferences. To answer these questions, the dynamics between Training Package enrolments and the following education and training options have been analysed:

- **higher education** (bachelor degree and above)
- **accredited VET** (non-training package accredited programs of study which lead to a nationally recognised vocational qualification or course)
- **non-nationally recognised training** (training which does not lead to a nationally recognised qualification)
- **schooling.**

Before beginning this analysis, it is important provide a brief overview of the training which the ICP Training Package offers, so as to give a baseline when making comparisons to other training options.

Printing and Graphic Arts Training Package

The Printing and Graphic Arts Training Package is the core of VET training in this sector. It comprises of:

- **8** qualifications
- **4** skill sets
- **281** native and **166** imported units of competency (UoCs).

UoCs are defined as either core or elective units, depending on the packaging rules of each qualification in which they are included. Learners can also complete 'skill sets', which are groups of units of competency that are designed to give the learner a particular skill.

Higher education

Higher education is not prevalent in the printing and graphic arts sector, with essentially all printing occupations being feed entirely through trade based apprenticeship qualifications. There are higher education

qualifications in graphic design (and other design or marketing occupations that may be involved in pre-press) but are mostly outside of having any real overlap with qualifications in the ICP Training Package.

Accredited VET

In addition to training package qualifications, RTOs may also deliver 'accredited courses', which are nationally recognised but do not exist directly within training packages (although accredited courses can be imported into training packages). Accredited courses can be developed by many parties, including RTOs and often complement training in training packages. However, courses can only be accredited if they:

- meet an industry, enterprise, educational, legislative or community need; and
- do not duplicate an existing training product under a training package.

Accredited courses exist for a variety of reasons, but owners of these courses must assert that there is an unfulfilled training need for these courses to be accredited. Typically these qualifications do not attract the same level of government support which VET attracts (such as VET FEE-HELP), although subsidised training may be available in some cases.

Although there are a large number of currently available accredited courses (1,353),[65] they make a relatively small part of the overall training landscape. As of 2014, accredited courses had approximately 441,000 enrolments out of 3.9 million total VET enrolments.[66] Compared to other sectors, printing and graphic arts has very few accredited courses in the same field. The closest are in visual communications, as shown in Table 10 (although this list is not necessarily exhaustive).

Table 10: Current accredited courses in printing and graphic arts fields

Course code	Course name
22285VIC	Certificate II in Signage and Graphics
10350NAT	Certificate III in Visual Communication (Design Communication / Photo Communication)
10351NAT	Certificate IV in Visual Communication (Design Communication / Photo Communication)
10352NAT	Diploma of Visual Communication (Design Communication / Photo Communication)
10353NAT	Advanced Diploma of Visual Communication (Design Communication / Photo Communication)

Given that accredited courses are designed to cover gaps in training packages or address training in new or emerging areas, it is useful to review current accredited courses to identify areas of training that should be included in the ICP Training Package. As mentioned, above government support such as VET FEE-HELP is generally not available for accredited courses, so including them in the ICP Training Package where necessary and relevant may increase the affordability of, and access to, particular training. However, a lack of accredited courses in the area show that there are unlikely to be gaps in training that need to be covered.

Non-nationally recognised training

Training pathways in the sector have been traditionally built around entry level apprenticeships at a Certificate III level with further learning done on the job or through non-nationally recognised training vendor or short course training. This non-nationally recognised training is important because that is where workers have the fastest exposure to the newest technologies, before they are adopted or understood by employers or RTOs. Due to the pace of the rate of change and high cost of some equipment, there may be no reasonable alternative to vendor training in some areas of the sector.

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65 Department of Industry (2014) *Review of training packages and accredited courses – discussion paper*

66 NCVER (2014) *Total VET Activity*

However, non-nationally recognised vendor training does have some limitations:

- Non-nationally recognised training is not quality assured by national training authorities. As such, these courses cannot be formally nationally recognised, can be not nationally portable, and are generally not supported by government funding. It also means that there are fewer checks on quality, and potential users of the training must be guided by reputation to understand the value of training.

- Additionally, vendor and non-nationally recognised training can be tailored to vendor needs and outcomes and therefore not necessarily broad enough to cover a complete industry skill. This means that it is not suited to developing a learner from a limited basis to be work ready, but rather is used to upskill in emerging areas or current skills gaps.

Schooling

Schooling typically precedes VET or higher education, providing students with the right skills to move to the next stage of their education or enter the workforce. However, high school students have the option of gaining skills relevant to the printing and graphic arts sector while in school. This can be achieved either through a formal VET in Schools program (VETiS) where they complete a lower level qualification (generally Certificate II) from the ICP Training Package or through taking non-vocational classes developed by the relevant state curriculum authority which relate to printing and graphic arts.

Non-vocational classes

Non-vocational courses related to printing and graphic arts are not particularly common as a part of state and territory school certificates, although some basic skills in design may be included in visual arts courses. Due to a lack of speciality and industry focus, these courses are unlikely to offer a substitute for lower level ICP Training Package qualifications.

VET in Schools

Vocational training in the ICP Training Package can be undertaken by school students as a part of their senior secondary school certificate. Within VETiS students can either undertake school-based apprenticeships and traineeship, or VET as a part of their school curriculum. As shown in Table 11 below, VETiS enrolments typically make up a small proportion of total enrolments, with VETiS enrolments concentrated in lower level qualifications.

Table 11: VETiS enrolments in Printing and Graphic Arts qualifications

Qualification	2014 VETiS enrolments	2014 total enrolments	VETiS % of enrolments
Certificate II in Printing and Graphic Arts (General)	127	446	28%
Certificate III in Print Communications	19	401	5%
Certificate III in Printing	2	1,129	0%

Source: NCVER VETiS Students 2006-2014 & 2014 Total VET Activity, included qualifications with VETiS enrolment
NB. Data only covers 2014 enrolments, older qualifications have been mapped to the applicable current ICP qualification for consistency, but may not have actually been enrolled under that code, and this should be used as indicative only.

For training product development, it is important to understand what qualifications are being delivered in schools and how that can be facilitated when appropriate or investigated further when it does not seem appropriate.

Implications for the Printing and Graphic Arts Training Package

The ICP Training Package plays an essential role in the training of workers in the sector, with few available substitutes. There are limited school, higher education or other accredited VET pathways that lead to the same outcomes.

However, the vendor training is likely to play an ongoing important role in supplementing that training and upskilling workers already in the sector and it is important that any review of the ICP Training Package keeps this in mind and works to best leverage the flexibility of non-nationally recognised training training.

Appendix C Review of the Training Package structure

The previous sections illustrated the need for a strong connection between Training Package content (qualifications, skill sets and UoCs) and the skills needed in industry. It also needs to be considered how qualifications, skill sets, and UoCs could be better constructed, ensuring better communication of skills attainment to industry and better skills outcomes for learners.

This initial review has raised a number of issues with how the Training Package is structured to meet both learner outcomes and employer expectations of training:

- **Recent changes to the Training Package**
- **Examination of pathways**
- **Recognition of prior learning**
- **Potential duplication of UoCs**
- **Limited use of skill sets**
- **Use of electives**
- **Relationships with other Training Packages**

This section will consider how the current Training Package is structured and how it is performing against these review areas and discuss possible changes to its structure. The practicalities and impacts of any potential change will also be considered.

Recent changes to the Training Package

The current version of the ICP Training Package was released on 15 January 2016. The changes in the previous major release are summarised below in Table 12. Feedback has indicated that these changes are not well known about or understood within the sector. Monitoring uptake and progress will be the first priority before conclusions can be drawn about this new structure.

Table 12: Recent changes to the ICP Training Package

	Added	Updated	Removed
Qualification	**Three qualifications were added** 1. Certificate III in Printing 2. Certificate III in Print Manufacturing 3. Certificate III in Print Communications	**Five qualifications were updated** 1. Certificate II in Printing and Graphic Arts (General) 2. Certificate IV in Printing Graphic Arts 3. Certificate IV in Printing and Graphic Arts (Mail House) 4. Certificate IV in ePublishing 5. Diploma of Printing and Graphic Arts	**Eleven qualifications were removed** These qualifications were all specialised versions of the Certificate III in Printing and Graphic Arts, in the following areas; Graphic Design Production; Graphic Prepress; Multimedia; Digital Printing; Printing; Screen Printing; Print Finishing; Sacks and Bags; Cartons and Corrugating; Mail House; and Ink Manufacture.
Skill sets	**Three skill sets were added** 1. 3D Print Fundamentals 2. Digital Colour 3. Advanced Digital Colour	**No skill sets were updated**	**No skill sets were removed**
Units of competency	**Four UoCs were added** 1. Develop knowledge of the printing and graphic arts industry 2. Set up and produce 3D print 3. Set up and produce 3D scan 4. Manipulate 3D graphics files in preparation for 3D printing	**Nine UoCs were updated** 1. Set up and produce hand-bound book 2. Create an extensible document 3. Create an extensible style sheet 4. Set up for basic flexographic printing 5. Use colour management for production 6. Produce PDF files for online or screen display 7. Develop a detailed design concept 8. Create pages using a page layout application 9. Prepare stencil using photographic capillary method	**Eleven UoCs were removed** These UoCs were all versions of 'apply knowledge and requirements' of each of the sub-sectors that had specialised qualifications that were removed (as above).

Source: Difference between Australian Government (2016) *ICP Printing and Graphic Arts Training Package, Release 2.0* and *Release 1.0* as displayed on <training.gov.au>

Examination of pathways

With recent changes in the ICP Training Package, more information is needed to fully comprehend how learners engage with the vocational education system and utilise pathways. The National Centre for Vocational Education and Research is building the unique student identifier database to access this information. In the interim, stakeholder feedback has raised the following issues in regards to pathways in this Training Package:

- **Certificate III is the industry standard.** Employers expect a Certificate III for new hires, but have limited use for other levels of qualification. The lower level Certificate IIs are only generally undertaken

as a school pathway in to employment in which most of the technical skills are learnt practically on the job (an apprenticeship model). There is limited use of pathways through higher level qualifications for upskilling.

- **The occupational outcomes of Certificate IVs and Diplomas are not well understood.** IRC feedback indicates that is not well known why a learner would undertake these higher level qualifications and the employment outcomes expected as the result of that training.

- **Full learning pathways rely on a mix of formal and informal training.** While entry into the industry is apprenticeship based, further learning relies on non-nationally recognised training or informal training in vendor or other short courses.

Further time for industry to learn about and adapt to these new qualifications is required.

Recognition of prior learning

It has been raised in IRC consultation that a large amount of current enrolments, up to 80 per cent, are the result of qualifications being earned in some substantial part through recognition of prior learning. This may be a way of retaining flexibility in learning and be a way to certify the mix of formal and informal training in the sector. However, it may also be undermining the traditional apprenticeship culture if the same qualification can be achieved without that on the job learning pathway.

It is recognised that recognised prior learning should be promoted and encouraged where appropriate. However, consideration needs to be given as to whether recognition of prior learning is achieving the outcomes that the sector requires from vocational training and how it fits in with identified learning pathways.

Potential duplication of UoCs

Where qualifications have similar required competencies and occupational outcomes, sharing of UoCs can avoid duplication. The sharing of UoCs across qualifications is strongly encouraged and further sharing was a recommendation of the COAG Skills and Workforce Development Sub Group *VET Products for the 21st Century* report in 2009.[67]

As many of the priority skill development needs in the printing and graphic arts sector are employability skills which are shared with other sectors, a way to avoid overlap may be to examine if other Training Packages are already teaching these skills and if any existing UoCs can be leveraged. However, this also needs to be balanced with the specific needs of the printing and graphic arts sector and whether the content of imported UoCs need to be nuanced to the requirements of printers or graphic artists.

Table 13 shows the where the ICP Training Package currently imports UoCs from. Further consultation with industry is required to better understand these needs before engaging in further analysis of relevance or use of these imported UoCs. This may also indicate where it may be possible to find other relevant UoCs that might be possible to import.

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67 COAG Skills and Workforce Development Sub Group (2009) *VET Products for the 21st Century*, available at <http://www.acal.edu.au/publications/documents/Foundation_Skills_in_VET_Products_for_the_21st_Century.pdf>

Table 13: Training Packages which Printing and Graphic Arts imports the most UoCs from

Training Package	Number of UoCs imported in to Printing and Graphic Arts
Business Services Training Package (BSB)	52
Information and Communications Technology (ICT)	50
Creative Arts and Culture Training Package (CUA)	32
Construction, Plumbing and Services Training Package (CPC08)	26
Sustainability Training Package (MSS11)	9
Retail Services Training Package (SIR07)	6
Manufacturing Training Package (MSA07)	5
Laboratory Operations Training Package (MSL09)	5
Transport and Logistics Training Package (TLI10)	4
Training and Education Training Package (TAE10)	2
Automotive Manufacturing Training Package (AUM)	1

Source: Australian Government (2016) *ICP Printing and Graphic Arts Training Package, Release 2.0*

Another place to check for duplication will be within the ICP Training Package, particularly between qualifications at similar levels (i.e. all Certificate III or Certificate IVs). There may be scope to consider rationalising the number of UoCs to avoid duplication of content. Although this will be done through consultation with employers and industry to better understand the currency and relevance of the UoCs, some initial examples of possible duplication include the following:

- There are two current native UoCs called 'Produce computer image for screen printing' (ICPPRP382 and ICPSCP382).
- There are two UoCs in the ICP Training Package (one native and one imported) that are aimed at a similar skill level with the content being 'just in time' systems (ICPSUP485 and MSS405021A).
- There are seven imported UoCs addressing environmentally sustainable work practices that appear to be duplicative content, just imported from two different Training Packages (BSBSUS201, BSBSUS401, BSBSUS501 and MSACMT270A, MSACMT271A, MSAENV272B, MSAENV472B).
- Native UoCs are contained across different subject areas lead to duplicate content. For example, competencies relating to preparing for coating products are contained in ink manufacture, printing and support subject areas ('ICPINK331 Manufacture inks and coatings', 'ICPPRN271 Set up for basic coating' and 'ICPSUP212 Prepare coatings and adhesives')

Reduction of duplication where appropriate will be considered in training product review.

Limited use of skill sets

Often learners will not need nor want to complete an entire qualification. Of those learners who discontinue study before completing a qualification, it is estimated that 23 per cent leave because they have acquired the skills they sought.[68] An alternative for these learners is to complete a skill set. Skill sets are sets of units of competency which learners can be given recognition for on their statement of attainment.[69]

[68] Productivity Commission (2012) *Research report: Impacts of COAG Reforms – Business Regulation and VET*

[69] Australian Skills Quality Authority (2015) *Fact Sheet: Sample AQF documentation*, accessed at <http://www.asqa.gov.au/news-and-publications/publications/fact-sheets/sample-aqf-documentation.html>

Skill sets are also available to learners who complete a full qualification, in recognition of the particular elective choices that were made. However, feedback from learners has indicated that most learners and employers were unaware that completing certain groups of units of competency could be formally recognised.[70]

Currently four skill sets available to learners in the ICP Training Package.

- Digital Fundamentals Skill Set
- Digital Colour Skill Set
- Advanced Digital Colour Skill Set
- 3D Print Fundamentals Skill Set.

Even within a Training Package with eight qualifications, this is a limited use of skill sets. However, the addition of these skill sets is new (as shown above in Table 12) and as such further time and review is required to understand how employers and learners currently use and view skill sets and how clearly they are communicating attainment of skills to industry. Of particular interest will be use of the 3D Print Fundamentals Skill Set.

However, even without giving time for industry to adjust to the use of skill sets, one conclusion can be drawn. Within current qualification packaging rules, it is not always possible for a learner to complete a skill set, even if they wanted to. This is because a learner may want to complete a particular skill set requiring four UoCs to be completed but if none of these UoCs are completed as core units and only three elective units can be completed in the qualification, then the learner cannot complete the skill set.

Initial testing on the skill sets was conducted to see in which qualifications it would be possible to achieve these skill sets within existing packaging rules (i.e. examining the UoCs in the skill set and seeing if they fit within core subjects, named electives or the rules for choosing electives outside those that are named within the qualification). This is shown below in Table 14 below, with red indicating it is not possible to achieve the skill set in that qualification and orange indicating it is only possible through careful elective choice. None of the skill sets are automatically achieved in any of the qualifications. Of particular interest is the skill set in Digital Colour. As there is an advanced version of this, the included UoCs in this basic skill set are of a low level (particularly 'ICPPRN285 Use digital workflow'). However, this means that they cannot be included in the packaging rules of the higher level qualifications, where unnamed electives usually need to be at the level of the qualification or higher. Therefore, it is not possible to complete the Digital Colour skill set in any of the Printing and Graphic Arts qualifications.

[70] Department of Industry (2014) *Review of Training Packages and Accredited Course – Discussion Paper*

Table 14: Compatibility of skill sets

Qualification	Skill set			
	Digital Fundamentals	Digital Colour	Advanced Digital Colour	3D Print Fundamentals
Certificate II in Printing and Graphic Arts (General)				
Certificate III in Print Manufacturing				
Certificate III in Print Communications				
Certificate III in Printing				
Certificate IV in Printing and Graphic Arts (Mail House)				
Certificate IV in ePublishing				
Certificate IV in Printing and Graphic Arts				
Diploma of Printing and Graphic Arts				

Source: Australian Government (2016) *ICP Printing and Graphic Arts Training Package, Release 2.0* and PwC SFA analysis
Note: Red means that the skill set is not able to be completed within the packaging rules of the qualification, orange means the skill set is able to be completed with strategic elective choice and green means the skill set will automatically be obtained within the core units of the qualification.

Use of electives

While it is recognised that many learners have restricted choices of electives which are offered through their RTO, a potential issue is the large variance in number of different UoCs which can be offered to learners in different qualifications. Whilst a greater number of elective UoC choices means that RTOs can offer tailored learning, it also means that graduates with the same qualification may have very different skills and have completed very different units. This creates a challenge in signalling actual skills attained to potential employers. Conversely, qualifications with less choice in possible electives allow less flexibility of learners and RTOs but give employers a greater chance to understand what training those graduates have actually completed.

Currently, elective UoCs in the ICP Training Package are grouped into broad fields allowing learners to specialise in a particular subsector, with learners often able to choose from a very large number of electives. However, if a learner does choose to specialise through their elective choice, this is no clear market signal to employers that they have done so and no clear guidance as to the core units in this specialisation. In to the future, skill sets may be able to be used to promote and guide specialisation, as they are able to be recorded on the formal statement of attainment and require learners to complete a set range of UoCs. By earning a skill set, learners may also be able to demonstrate to employers that they have the requisite knowledge and skills in that particular specialisation or subsector.

It is recognised that as a part of the previous consolidation of qualifications in the ICP Training Package, a deliberate choice to keep a large number of elective options was made, with the intention of doing a full review of qualifications at a later date. The training product review plan in section F sets out the schedule for the full review of these qualifications and UoCs, which may include a review of elective options and skillsets available.

Relationships with other Training Packages

There is potential overlap of the training delivered in the ICP Training Package with the training delivered in other Training Packages. In particular, similar occupations appear to be served by the Creative Arts and Culture Training Package (in terms of graphic design), as well as the Construction, Plumbing and Services Training Package (in signage).

Table 15: Potential areas of overlap with other Training Packages

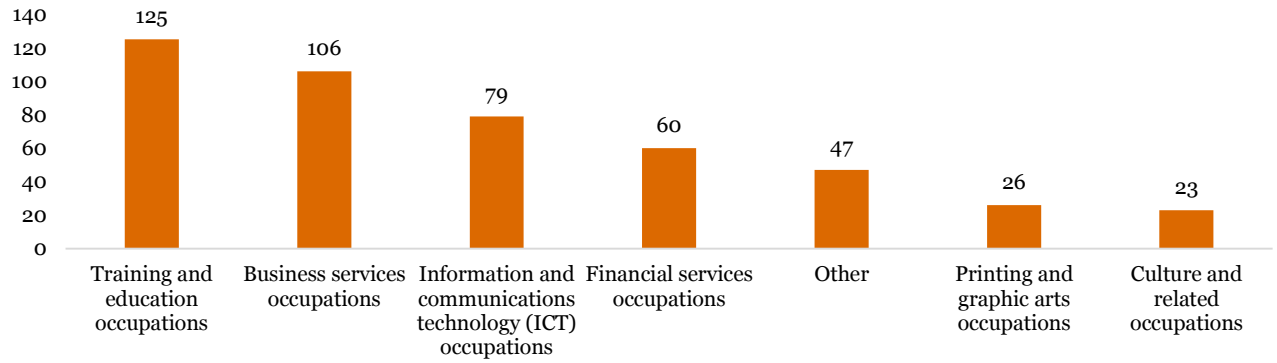
Area of overlap	Content of Printing and Graphic Arts Training Package	Content of other Training Package
Graphic Design	**Diploma of Printing and Graphic Arts** Competencies taught include: • Create 3D digital animations • Design animation and digital visual effects • Author interactive media • Manage multimedia production • Manage multimedia projects • Digitise images for reproduction • Operate a datable for digital printing • Implement copyright arrangements	**Diploma of Graphic Design (Creative Arts and Culture Training Package)** Competencies taught include: • Produce graphic designs for 2-D and 3-D applications • Create and manipulate graphics • Use and respect copyright • Optimise digital media impact • Write persuasive copy • Author interactive media • Design digital simulations • Digitise complex images for reproduction • Prepare digital images for pre-press processing
Signage	**Certificate III in Printing** Competencies taught include: • Develop a basic digital design concept • Manually produce complex screen prints • Produce and manage complex digital print • Apply software applications to digital production • Use colour management systems • Prepare artwork for screen printing • Produce computer image for screen printing	**Certificate III in Signage (Construction, Plumbing and Services Training Package)** Competencies taught include: • Use colour for signage • Lay out and design signage • Produce digital signage • Screen-print signage • Use engraving systems • Signwrite to decorative forms • Fabricate signage • Prepare surfaces for signage • Produce digital signage using advanced software applications

Sources: Australian Government (2016) *ICP Printing and Graphic Arts Training Package, Release 2.0;* Australian Government (2015) *Creative Arts and Culture Training Package, Release 2.0;* Australian Government (2015) *Construction, Plumbing and Services Training Package, Release 1.1*

Appendix D Industry Voice Survey

PwC's Skills for Australia Industry Voice Survey was created to facilitate consultation and engagement with employers in a variety of industries. There were 193 complete responses to the survey, which was open from the 19th of May to the 30th of June 2016. The composition of these responses is set out in Figure 11.

Figure 11: Organisations that hire for these occupations (multiple responses allowed)



Source: PwC's Skills for Australia *Industry Voice Survey 2016* – all respondents (n=193)

Figure 12 and Figure 13 illustrate the distribution of these respondent organisations by size and location. Note that all respondents identified having all or some influence over training in their organisation.

Figure 12: Size of respondent organisation

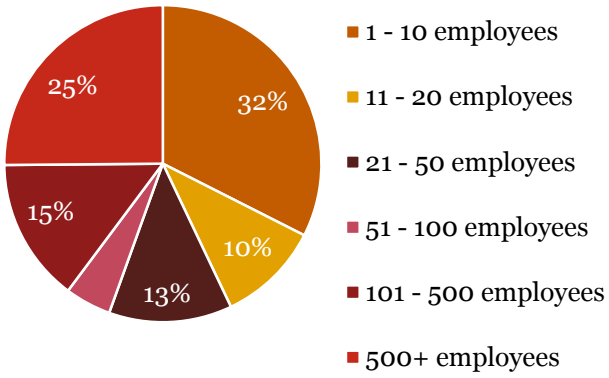
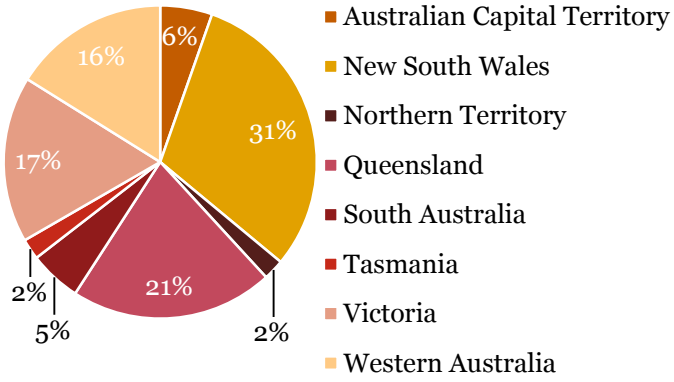


Figure 13: Primary state or territory



Source: PwC's Skills for Australia *Industry Voice Survey 2016* – all respondents (n=193)

There were 26 responses from employers in the printing and graphic arts sector. It is recognised that this sample is too small to assume that the views of these respondents are indicative of the views of the broader sector. Therefore this analysis of these responses has been omitted from this Work Plan. Despite this, the information still provides a valuable insight into the views of employers that are engaging with PwC's Skills for Australia, which will inform discussions with other printing and graphic arts employers and information gathering going forwards.

Industry Skills Forecast and Proposed Schedule of Work

Printing and Graphic Arts

Printing and Graphic Arts

April 2018

pwc

Private & Confidential

01/05/2018

Industry Skills Forecast and Proposed Schedule of Work

Across the vocational education and training (VET) sector there are over 4000 training providers educating approximately 4.2 million students, delivering 3.7 million program enrolments across 30.1 million subject enrolments. The responsibility to ensure students learn work ready skills that meet industry needs cannot be understated. This gives learners the chance to make an impact when they enter the workforce and upskill or reskill whilst throughout their working lives; the VET sector is key to ensuring Australia remains at the forefront of global competitiveness and supports continued economic prosperity.

The role of the Printing and Graphic Arts Industry Reference Committee (IRC), supported by PwC's Skills for Australia, is to put employers in this industry at the heart of Australia's qualifications and training system. The Printing and Graphic Arts IRC, governed by the Australian Industry and Skills Committee (AISC), sets the standard for recognised skills and seeks to realise the value of the national system.

The 2018 Industry Skills Forecast and Proposed Schedule of Work details the training product priorities for the IRC through to June 2022. These priorities are developed in response to the identified skills and knowledge needs in the workforce, which are translated into the learning requirements set out in training products. The insights and recommendations within this document are based on analysis of historical and the most current data made available, extensive industry consultation, input from IRC members, broader stakeholder engagement activities, and public feedback. Underpinning this approach is a focus on the future of skills needs in the context of Australia's economic and workforce trends, considering how disruptive forces are likely to change employers' needs and demands.

Accessing vocational education and training and increasing recognition of skills should be a process that is both simple and effective. The Printing and Graphic Arts IRC and PwC's Skills for Australia will continue to strive to enhance training packages to meet the needs of industry and better skill our workforce.

Yours sincerely,

Sara Caplan
CEO
PwC's Skills for Australia

Andrew Macaulay
Chair
Printing and Graphic Arts IRC

Executive summary

As one of the largest manufacturing sectors in Australia, the Printing and Graphic Arts industry is a significant contributor to many aspects of the Australian economy and workforce. The industry facilitates the effective communication of messages through a range of media platforms and assists creative industries to deliver their products. As different parts of the sector are contracting, growing or transforming in response to external forces, it is important that Vocational Education and Training (VET) reflects an understanding of this industry change and the necessary adaptability and sustainability of the industry itself. The Printing and Graphic Arts (ICP) Training Package is critical to this system, playing a central role in equipping learners with work ready skills that reflect the capabilities required by an evolving industry.

Key trends impacting the Printing industry and, subsequently, the industry's workforce, include:

- The potential growth of several areas, such as customised direct mail advertising, food labelling and packaging and other consumer goods.
- Challenges related to attracting new talent and retaining existing talent.
- The opportunity for industry participants to expand into non-traditional service offerings, such as data driven customisation and multi-channel marketing whilst retaining printing as a core service offering.
- Digital and technological changes which continue to influence the demand of roles in which people work and the service offerings of the industry.

Within this environment of change, current and future job roles within the industry will be impacted. For example, there will be an increased demand for employees in areas of growth, who will require a combination of broad industry awareness, problem solving skills and the agility and flexibility to embrace new roles. Therefore, it will be critical that ICP learners are trained with the appropriate skills and capabilities to meet the shift in needs of a broadening sector. In order for learners to be appropriately skilled to meet the changing demands within the industry, it is essential that the Printing and Graphic Arts Training Package is appropriately configured.

In response to these drivers for change, the Printing and Graphic Arts Industry Reference Committee (IRC) has proposed a review of the Printing and Graphic Arts Training Package. The parameters of the review will include an assessment of the structure and content of the ICP Training Package with a focus on the emergence of new skills required by learners as the market adjusts. This Industry Skills Forecast and Proposed Schedule of Work (ISFPSW) provides the basis for the review and the need for this to accurately reflect the current and future needs of the industry. This is delineated in the following segments:

1. **Sector Overview –** This section outlines the parameters of the Printing industry workforce, including where individuals in the sector are employed, the activities undertaken, and the challenges and opportunities faced by many learners and workers.

2. **Employment and Skills Outlook** – Current and future employment projections in the Printing industry and factors that many influence the supply of graduates to fill these positions are discussed to understand future supply and demand within the sector. The skills needs and job roles of these learners and workers are considered through a lens of the trends affecting the Printing industry as a whole. This assessment is central to informing an understanding of future job roles and necessary skills needs within the sector more broadly, as well as the specific elements that may need inclusion in the Training Package.

3. **Key Drivers for Change and Proposed Responses** - This section serves as the Case for Change for the ICP project 1C scheduled in 2018-19. It outlines the factors driving change in the Printing workforce, including the impact each change may have on skills needs, workers and learners in the sector and the ICP Training Package. These factors and impacting the current and future job roles in

the Printing industry and the ICP Training Package must be updated to reflect the skill and capability requirements of the job roles.

4. **Proposed Schedule of Work** – The implication of the trends and drivers affecting the Printing industry workforce is the modification of the ICP Training Package. Drawing on the above analysis of trends and skills needs in the industry, the Proposed Schedule of Work articulates the training product development priorities within the ICP Training Package. The purpose of the schedule is to ensure that learners are appropriately skilled to enter a sector affected by the above trends. A summary of all training product development projects in the Proposed Schedule of Work is shown in Table 1 below.

Table 1: Summary of Proposed Schedule of Work

Year	Project type	Project code	Project name	Number of Native UoCs
2018-19	TPD	1c	Design, marketing and other pre-press technical UoCs	66
Total UoCs in scope of review in year 2				**66**
2019-20	TPD	1d	Print and post-press technical UoCs	180
Total UoCs in scope of review in year 3				**180**
2020-21	TPD	1e	Review of UoCs updated in 2016-17 and 2017-18 for currency	Unknown
Total UoCs planned to be reviewed in all years				**246**

Contents

A. Sector overview

The sector at a glance

The printing and graphic arts sector includes workers in Australia with skills that help organisations to communicate messages effectively through a range of media channels, as well as supporting creative industries in the delivery of a broad range of their products. Technological disruption and global industry trends have created a rapidly changing environment that requires changes to the industry skills profile.

The Printing and Graphic Arts (ICP) Training Package has eight qualifications from Certificate II to Diploma, with a focus on the Certificate III level. More detail of the ICP Training Package, including an overview of enrolment levels, is included after the sub-sector descriptions and overview by location.

Sub-sectors

The ICP Training Package, unlike other Training Packages, serves a limited and relatively defined workforce (as opposed to having many sub-sectors). The ICP Training Package prepares learners to enter two general occupations: printer and pre-print graphic artist. Due to the generalist nature and limited number of qualifications in the Training Package, each qualification cannot be said to be leading to a single specific occupation, but rather all the qualifications can be used to prepare for either occupation (which may be at different levels of seniority or responsibility).

Sub-sectors are therefore not particularly relevant in printing and graphic arts. Occupations in the industry have traditionally had a variety of specialisation areas, which is at the individual level and these individuals may work together in the same organisation or separately, but still fall in the same sector of creating printed products for clients. Specialisation areas have historically included:

- cardboards, cartons and corrugations
- converting binding and finishing
- desktop publishing
- digital printing
- digital production
- graphic pre-press
- ink manufacture
- mail house
- multi-channel communications
- multimedia
- print finishing
- print production support
- printing
- process improvement
- sacks and bags
- screen printing.

Anecdotal evidence from IRC members and consultations continues to suggest that, increasingly, printing and graphic arts workers are working within multidisciplinary communications teams. In these teams, printing and graphic arts workers are doing a broad range of activities such as developing marketing strategies, designing marketing materials for print and online distribution as well as working closely with workers from other related fields such as information technology and advertising.

Overview by location

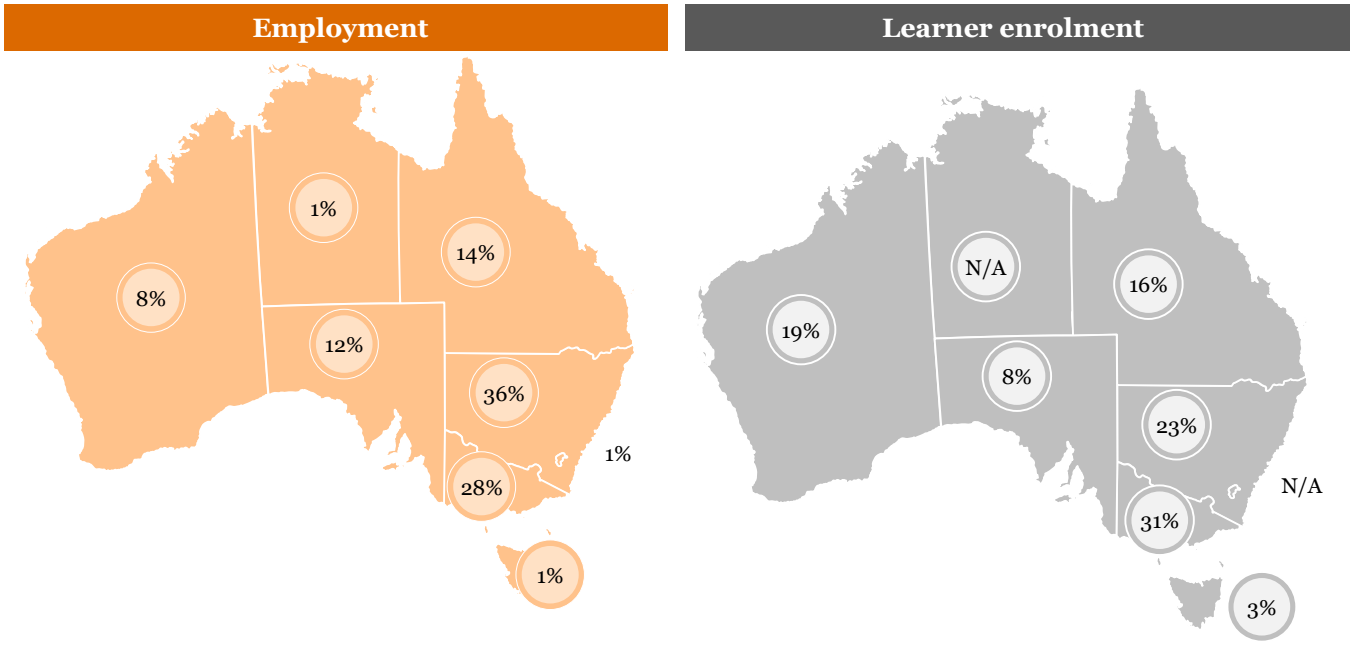
In developing printing and graphic arts training, ensuring direct linkage from a learner's training to their employment in the sector is important. One of the factors influencing the strength of these linkages is the geographical distribution of learners and their employers, with learners ideally located in the same region as their employers.

Key differentiating factors between the states and territories include:

- **Business clustering.** Similar businesses tend to co-locate in certain geographical areas or states. By co-locating, businesses may be able to improve their operating efficiency, leveraging existing networks, related businesses and interpersonal connections between workers.
- **Economic drivers.** The economic drivers within a state or territory shape the composition of sectors and employment. Given this influence, it is unsurprising that the number of workers and learners differ on a state and territory basis, and may have a higher/lower representation comparative to the population.
- **Lack of Registered Training Organisations (RTOs).** Currently the only option for students in the Northern Territory and the Australian Capital Territory is online education. This may be due to the high cost of running a Printing and Graphic Arts training program.

In addition to the above, geographic differences are driven by the ability of larger business and RTOs to attract trainees and fund training. Stakeholders have noted that these factors have been influencing low enrolments in New South Wales. PwC's Skills for Australia will work with industry and RTOs to understand the extent to which this is driving enrolments in other states and territories. Figure 1 below shows the current geographical distribution of domestic learners enrolled in printing and graphic arts training, alongside the distribution of employment in typical printing and graphic arts occupations.

Figure 1: Geographic spread of workers and learners



Source: Australian Bureau of Statistics (November 2017) *Labour Force, Australia – Detailed Quarterly*, cat. no. 6291.0.55.003, NCVER (2017) *Total VET Activity 2016*.

Note: Learner enrolment data includes enrolments in (7) qualifications in 2016 only, excluding all enrolments in Certificate II, as that qualification is primarily used as VET in Schools training and is not seen as directly leading to occupational outcomes. The printing and graphic arts sector has been defined by 6 unit level (4 digit) ANZSCO occupations. This definition has been based upon ANZSCO qualification classifications, taxonomy mapping and occupational outcomes of ICP qualifications. N.B Employment in the printing and graphic arts sector cannot be directly defined by the ANZSCO classification of qualifications these are at the 6 digit ANZSCO level but state-by-state employment data is only available at 4 digit level. Note 2: Learner enrolment data presented based on learner location – students who were located in other Australian territories or dependencies, overseas or not know were not included in the percentage calculations.

Note 3 – the 2017 Industry Skills Forecast based learner enrolment on delivery location as opposed to learner location therefore care should be taken when comparing these statistics.

Given that a large proportion of the printing and graphic arts sector heavily utilises an apprentice based training model, it is likely to be more difficult for learners to move between states (as a new employer supporting the apprentice would need to be found and enrolment in training transferred to a new provider). As such, problems in the geographical mismatch of employers and learners may persist and cause issues in the sector as workers are unlikely to be highly mobile. However, it is recognised that there are a small number of learners enrolled in ICP training and learner enrolment data as presented in Table 2 below, may vary from year to year.

Training Package profile

There are eight qualifications in the ICP Training Package as detailed in Table 2. Of the 4.2 million vocational education and training learners enrolled in 2016, just 1,966 were enrolled in the Printing and Graphic Arts Training Package,[1] down 23 per cent from 2015.

Table 2: Qualification scope and program enrolments

Qualifications	RTOs with scope (Jan 2018)	UoCs (native and imported)	Program Enrolments (2016)
Certificate II in Printing and Graphic Arts (General)	21	148	295
Certificate III in Print Manufacturing	8	129	485
Certificate III in Print Communications	17	86	396
Certificate III in Printing	10	165	717
Certificate IV in Printing and Graphic Arts (Mail House)	1	45	N/A
Certificate IV in ePublishing	0	91	N/A
Certificate IV in Printing and Graphic Arts	8	132	51
Diploma of Printing and Graphic Arts	8	110	22

Source: NCVER (2017) *Total VET Activity 2016*; Training.gov.au (2018) *RTO Scope Search Reports*

Note 1: enrolments are taken from 2016 data before Training Package consolidation and therefore numbers reflect all enrolments including those in superseded qualifications.

Businesses and stakeholders in the sector

The views of businesses, learners and other key stakeholders in the printing and graphic arts sector are critical to understanding the skills needs in the workforce. Our approach to the training product review is centred on this feedback and their views of the challenges and opportunities in their sector and organisations.

The Printing and Graphic Arts sector relies on a broad range of businesses from micro-businesses through to large organisations with varying scopes of work undertaken. These businesses may operate on a local, state, national and even global level particularly in book, magazine and periodical printing[2]. Key stakeholders in the sector and locations are listed in Table 3 below. Consultations are ongoing and may include those not explicitly captured in this list.

[1] National Centre for Vocational Education Research (2017) *Students and courses 2016*

[2] IBISWorld Industry Report C1611 (2018) *Printing in Australia* <http://clients1.ibisworld.com.au/reports/au/industry/default.aspx?entid=166> accessed 06/04/18

Table 3: Stakeholders in the printing and graphic arts sector

Stakeholder groups	Key stakeholders	Location
Training Product Development	• Australian Industry and Skills Committee (AISC) • Printing and Graphic Arts Industry Reference Committee • Other Industry Reference Committees (IRCs)	National
Government	• Australian Skills Quality Authority (ASQA) • Federal, State and Territory Departments • National Centre for Vocational Education Research (NCVER) • Victorian Registration and Qualifications Authority (VRQA) • Training and Accreditation Council (TAC)	National, State, Regional, Local
Employee representatives	• Australian Manufacturing Workers Union (AMWU) Print • Career advisors • Other unions	National, State, Regional
Employer representatives	• Australian Chamber of Commerce and Industry (ACCI) • Australian Graphic Design Association (AGDA) • Australian Industry Group (AIG) • Australian Sign and Graphics Association • Business Council of Australia (BCA) • Design Institute of Australia (DIA) • Printing Industries Association of Australia (PIAA) • Visual Connections • Other industry groups	National, State, Regional
Registered training organisations (RTOs)	• Private and community RTOs • Secondary schools (not all provide training) • Technical and Further Education institutions (TAFEs) • Universities (not all provide training) • Teacher and trainer networks	National, State, Regional, Local
Workers	• Graphic artists • Printers • Associated workers	Global, National, State, Regional, Local
Learners	• Domestic learners • International learners	Global, National, State, Regional, Local

Challenges and opportunities

There are a number of opportunities and challenges for the printing and graphic arts industry as a result of changes impacting the sector on both a national and international scale. In addition, there is a need to ensure there is collaboration on training package development across industry sectors, particularly in areas where there is crossover for example with manufacturing, to ensure usability of the training content in other sectors, where relevant.

The views on the challenges and opportunities faced by employers and learners have been drawn from research, surveys and interviews by the SSO and IRC and can be seen in more detail below.

Employer challenges and opportunities

Drawing on initial consultations with employers in the industry, two key messages have been identified:

- **Employers need support to invest in staff training and development**
- **Printing is continuing to evolve as an industry**

Employers need support to invest in staff training and development

As relayed by several Printing and Graphic Arts IRC Members, many employers in the printing and graphic arts sector have struggled to realise profitable growth over the past decade, largely due to the transition from traditional information sharing mediums to digital media content. This has inhibited employer ability to invest in the recruitment and professional development of staff. Employers and other stakeholders emphasised the importance of staff development to give workers the right mix of new and traditional skills and to provide adequate training in basic leadership and related skills. In interviews, stakeholders noted:

> *Training is following the funding, so we are producing graphic designers who can design for web and mobile, but they can't design for printing machines*
>
> *Michelle Lees, HP PPS Australia Pty Ltd*

- *Employers do not have the tools to support an apprentice* – Michelle Lees, HP PPS Australia Pty Ltd
- *RTOs do not have the resources to invest in understanding emerging printing technologies and establishing new courses given low enrolments* – Lorraine Cassin, AMWU Print Division

Printing is continuing to involve as an industry

Despite declining demand for traditional print media, employers noted several potential growth areas within printing, particularly in the customisable goods and 3D printing space. A common theme in consultations with our IRC, employers and professional institutions in the industry was the use of emerging print technologies to customise the user experience or market to users, such as on demand printing of customised goods as part of a multimedia marketing campaign. VET can play an important role in facilitating training as technological changes, ensuring employers have workers with appropriate skills, both technical and 'soft' to capitalise on technological change. In consultations, employers noted:

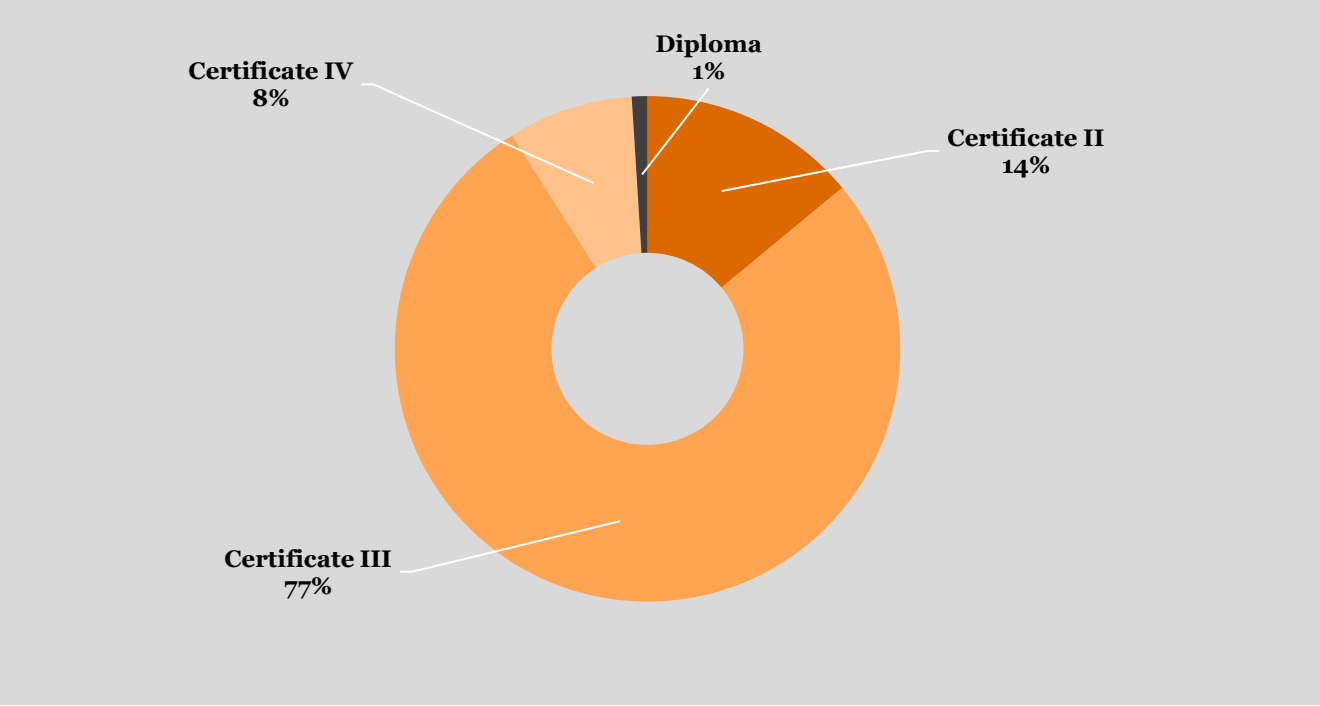
- *Less siloing of technical skills will result in a multifaceted worker, able to shift and change through different roles* – Julie Hobbs, FutureNow Creative and Leisure Industries Training Council and Design Institute of Australia

Learner challenges and opportunities

To give learners the best possible opportunity to get fulfilling jobs, and to help our country to succeed, it is first useful to understand a basic profile of learners and graduates in the ICP Training Package, and the challenges and opportunities they face. A typical learner in the ICP Training Package is:

- Above school age. In 2016, the majority of learners in the ICP Training Package (70 per cent) were over 20 years of age.[3]
- More likely to be enrolled in lower level qualifications. In the Training Package as a whole, 91 per cent of learners are enrolled in Certificate II and III qualifications (Figure 2), 10 per cent higher than 2015.[4] This is reflective of both the structure of the ICP Training Package, where learners are faced with the challenge of limited options, with only one Diploma on offer and nothing higher, as well as the choices made by learners.

Figure 2: ICP Training Package enrolments, by level of qualifications



Source: National Centre for Vocational Education Research (2017) *Total VET Activity 2016*, program enrolments

Note 1: enrolments are for 2016, previous to the Training Package restructure, therefore exact qualifications may no longer be representative

Drawing from the National Centre of Vocational Education and Research 2017 VET Graduate Outcomes data, the options and opportunities available to typical learners on completion of printing and graphic arts training are explored below.

- More likely to be employed than an average VET learner. 86 per cent of ICP graduates are employed six months after training, down from 91 per cent in 2016 and above the 78 per cent average across the VET sector.[5]
- Working in manufacturing. Approximately 63 per cent of graduates were employed in the manufacturing industry, a significant decrease from 76 per cent in 2016.
- Most likely to be employed in technical and trade roles. Of those graduates employed after training, 57 per cent were classified as technicians and trades workers.
- Earnings for an average graduate are comparable with VET graduates across the sector. ICP graduates earned $54,800 on average in 2017, compared to $55,000 across the VET sector.[6] This is a significant

[3] National Centre for Vocational Education Research (2017) *Students and courses 2016*

[4] National Centre for Vocational Education Research (2017) *Students and courses 2017*

[5] National Centre for Vocational Education Research (2017) *Total VET activity survey 2016*

decrease from an average of $62,300 in 2016, however it is above the 2015 average of $50,500, noting that the 2015 data excluded non-government funded graduates. The volatility of these results could be due to the low enrolment numbers in this training package.

- However, they are less likely to go on to further training. Only 27 per cent of ICP graduates go on to further training. This is low when compared to the 2017 average for graduates across all VET of 30 per cent.[7]

Employment prospects are above average

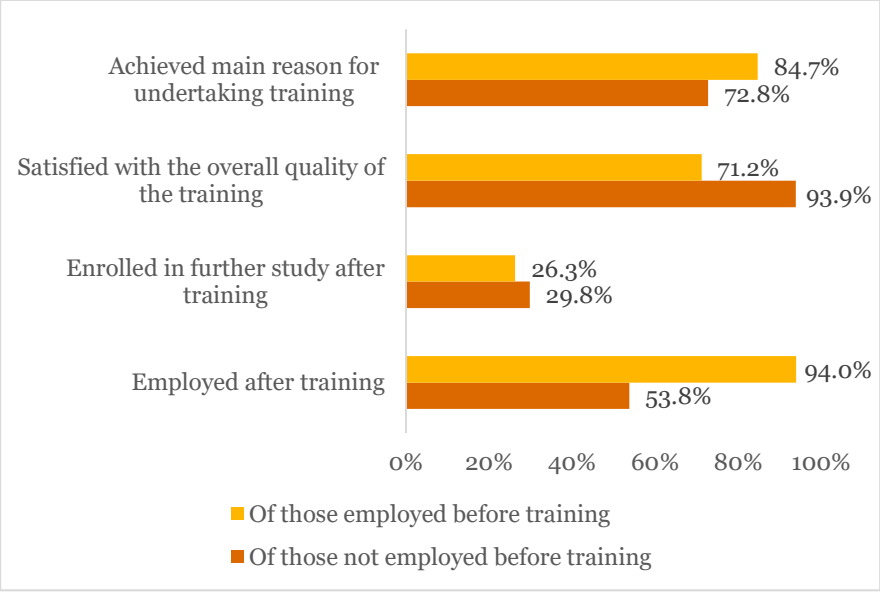
ICP graduates have better employment outcomes than the national average, with 86 per cent of graduates employed within six months, down from 91 per cent in 2016, and significantly higher than the total VET sector (78 per cent).[8] Of those employed, 77 per cent of graduates find their training relevant to their current occupation, with 56 per cent in the same occupation as their training course.[9]

Earnings are in line with the average

ICP graduates earned an average of $54,800 per annum (of those employed full-time after training), down from $62,300 in 2016 and in line with the $55,000 across the VET sector in 2017.[10] There is no clear explanation as to why average salaries have decreased so markedly, however the low number of graduates in the ICP Training Package may be causing volatility in the statistics year on year.

Figure 3 demonstrates that graduates of ICP training are largely satisfied with the quality of training received although it highlights the low number of graduates that enrol in further study after training.

Figure 3: ICP graduate satisfaction with training



6 National Centre for Vocational Education Research (2017) *Total VET activity survey 2016*

7 National Centre for Vocational Education Research (2017) *Total VET activity survey 2016*

8 National Centre of Vocational Education and Research (2017) *VET graduate outcomes*

9 National Centre of Vocational Education and Research (2017) *VET graduate outcomes*

10 National Centre for Vocational Education Research (2017) *Total VET activity*

Opportunities for collaboration on training development across industry sectors

Training Packages are not always developed in a way that recognises the importance of skills in multiple sectors and which can be used to their full potential in various industry contexts. The AISC has identified several cross sector skill areas where opportunities exist to create flexible and transferable package components that will benefit industry, learners and the broader VET sector.

PwC's Skills for Australia has been commissioned to develop training package components that address skill needs across industries in four cross sector skill areas: Cyber Security, Big Data, Teamwork and Communication, and Inclusion of People with Disability in VET. The expected outcomes of these cross sector projects include:

- Significant reduction in the level of duplication across the national training system
- Better support for individuals to move between related occupations
- Improved flexibility and efficiency in Australia's VET system.

Table 4 below identifies opportunities for linkages between existing cross sector project work and the ICP Training Package.

Table 4: Training development opportunities across industry sectors

Cross sector project	Project scope	Link to ICP Training Package
Automation	Identify related skill and knowledge needs in automated processes and the use of robotics, drones and remote operations systems shared by multiple industry sectors.	This project may affect current ICP UoCs related to workflow automation.
Big Data	Identify related skill and knowledge needs in data management, data analytics and data driven decision-making that apply across multiple industries.	This project may affect current ICP UoCs related to data-driven customisation.
Cyber Security	Identify related skill and knowledge needs in information security, data protection and privacy shared by multiple industry sectors.	Currently no identified overlap, however any unit created as part of the project will be considered for importation into the ICP Training Package where relevant and required by the industry.
Consumer Engagement through Online and Social Media	Identify related skill and knowledge needs in cultural awareness, customer service, marketing, communication and social media skills shared by multiple industry sectors.	Potential overlap identified specifically related to the shift toward a greater customer focus within the printing industry and the impact of digital on marketing and advertising which is impacting on the skills needs of individuals. Where appropriate, the leveraging of appropriate units for importation into ICP Training Package will be considered.
Digital Skills	Identify related skill and knowledge needs in digital literacy, 3D printing/additive manufacturing and coding skills that apply across multiple industries.	This project could affect a number of ICP UoCs, particularly those relating to digital printing; 3D printing; online newspapers; digital advertising; multi-channel marketing.

Cross sector project	Project scope	Link to ICP Training Package
Environmental Sustainability	Identify related skill and knowledge needs in environmentally friendly products, manufacturing and waste processes, and sustainable energy production that apply across multiple industries.	This project may affect current ICP UoCs related to disposal of waste and environmental hazards.
Inclusion of People with Disability in VET	Develop training package components that can be used by multiple industries to build the capability of VET educators and employers to foster greater inclusion of people with disability in vocational education and training, employment, and customer service contexts.	This project will consider the implications for the development of both printed and online materials in the ICP Training Package, including compliance with guidelines around accessibility such as web accessibility and screen readers, particularly for visually impaired students. This is essential to ensure that the print/graphic content being developed is accessible to people with disability.
Supply Chain	Identify related skill and knowledge needs in traditional supply chain management practices as enabling services for the economy that apply across multiple industry sectors.	This project may affect current ICP UoCs related to digital information and inventory management.
Teamwork and Communication	Develop common teamwork and communication units that address common skill and knowledge needs and can be contextualised across multiple industries.	This project may affect current ICP UoCs related to communication which is an increasingly essential skill for workers. The ability to collaborate and work as part of a team is required within organisations in order to understand the more diversified business in which they sit. The importation of appropriate units into ICP will be considered.

Industry consultation has identified a number of potential cross sector skill and capability areas, relevant for future workers in the printing and graphic arts sector and also more broadly applicable across multiple industry sectors. These present opportunities for future collaboration on training package development, improved flexibility, and enhancing occupational mobility for learners. Although not an exhaustive list of potential cross sector skill and capability areas, these include:

- **Adaptability and flexibility skills.** Given the ongoing evolution in printing and graphic arts, workers in the sector will need to remain open and receptive to new printing technologies and non-traditional product and service offerings. As well, the increasing demand for a multifaceted worker, who is able to shift and change through different roles in the printing and graphic arts sector, suggests a need for adaptability and flexibility skills. These skills also have broader applicability to other industry sectors, including: information and communications technology (given the accelerating pace of technological change in the sector); tourism and hospitality (e.g., to flexibly respond to different customer needs); health and nursing (e.g., to adapt and react to changes in patient needs).

- **Entrepreneurial skills[11].** The rapid advancements in digital and 3D print technologies, together with the rise of user experience customisation, suggest a need for entrepreneurial skills, particularly in creativity, innovation and marketing. Such skills also have broader applicability to other industry sectors, including: culture and related industries (e.g., where workers need to promote their professional brand and build a portfolio of work); construction (e.g., a business mindset to ensure a pipeline of new projects for business viability); retail (e.g., to support product evolution and business).
- **Resilience skills.** The time pressured, creative nature of work in the printing and graphic arts sector places demands on workers to be able to continuously innovate in time sensitive environments. As well as needing entrepreneurial skills, this suggests workers in the sector will increasingly need skills in resilience. Resilience skills also have broader applicability to other industry sectors, including: agriculture and farming (e.g., where farmers need to cope with the seasonality pressures on their crops); community services (e.g., where workers need to bounce back from emotionally challenging situations and outcomes); emergency services (e.g., where first responders continually face threats to personal safety); business services (e.g., where workforce managers need to bounce back from stressful management challenges).
- **Professional and ethical practice skills.** Workers in the printing and graphic arts sector may have, at any one time, multiple clients or be working on sensitive information before it reaches public domain. This suggests a need for skills in professional and ethical practice, and complying with legislative and regulatory requirements. Professional and ethical practice skills also have broader applicability to other industry sectors, including: financial services (e.g., to follow professional and ethical guidelines in the delivery of financial services and products); child care and support (e.g., to comply with legal responsibilities regarding working with children and following proper escalation procedures); food and beverage (e.g., to adhere to food safety standards and uphold company values and principles).

[11] Entrepreneurial skills used in this context refer to the commercial skills and mindset, the ability to take any idea and turn that concept into reality, bring it to market, and make it a viable product or service.

B. Employment and Skills Outlook

The purpose of this section is to provide a broad overview of the magnitude and growth of employment in the printing and graphic arts sector, and to discuss the factors which are likely to influence the supply of printing and graphic arts graduates to fill positions in the sector. It provides context for a more targeted analysis of the specific trends influencing the printing and graphic arts sector, which flow through to skills priorities and training needs.

In order to help understand the scale and growth of employment in the printing and graphic arts sector, historical and projected employment data from the Australian Bureau of Statistics has been analysed. Please also note that as with any empirical analysis of employment, there are limitations in the representativeness of employment data. As such, the limitations of any data are presented in addition to this analysis.

Industry employment outlook

Employment projections at an industry level are confined to specific occupational definitions used for statistical classification (as defined by ANZSCO).[12] The following occupations have been identified as being most indicative of the printing and graphic arts sector:

- Printers
- Paper and wood processing machine operators
- Print finishers and screen printers
- Printing assistants and table workers
- Graphic pre-press trades workers

Table 5 below shows both current and projected employment data for the above printing occupations at a 4 digit level ANZSCO occupation level. However before interpreting this data, it is important to recognise its limitations, namely:

- The scope of the above occupations may exclude some workers in the broader printing and graphic arts industry, or include some workers outside of the printing and graphic arts industry. As an example, not all media printing is included in the above occupations. The above occupations only include entities involved in printing of media such as newspapers or magazines without publication.[13] Employment in other integrated entities which both publish and print media such as newspapers or magazines is excluded.
- Paper and Wood Processing Machine Operators' is listed as a key occupation in the printing and graphic arts sector. While this occupational group does include operation of machinery used in production of printed paper packaging, it also includes those people involved in the manufacture of logs, plywood, solid laminates and similar timber products. As such, large proportion of employment in this occupational group is unrelated to the printing and graphic arts sector.
- Customisation of some printed products are not captured in the identified printing occupations. For example, employment in the production of self-published books or custom greeting cards are captured in the 'Book Publishing' and 'Other Publishing' industries respectively.

[12] Australian Bureau of Statistics (2006) *Australian and New Zealand Standard Industrial Classification Cat. No. 1292.0*

[13] Australian Bureau of Statistics (2006) *Australian and New Zealand Standard Industrial Classification Cat. No. 1292.0*

- Only employment which directly relates to the printing of documents and images is included in the above occupations. Furthermore, upstream services which printing and graphic arts workers may be involved in are not likely to be captured. Services which relate to print but are not directly part of the printing process – such as e-publishing, developing marketing strategies, graphic design or advice on how to effectively run a print advertising campaign – are typically not included in the identified printing occupations.
- Occupation level employment is inherently difficult to forecast. Part of the difficulty in producing accurate projections is the changing job roles of those involved in the printing and graphic arts sector. Changing job roles may cause workers to shift out of listed key occupations. For example, a printer who moves towards more of a sales or marketing role would not be captured within the key occupations.
- Employment is dependent on factors which are difficult to predict. Overall print volumes and hence employment is likely dependent upon consumer preferences for printed mediums over digital mediums. Further, the number of workers directly involved in the printing process i.e. 'Printers', 'Printing Assistants and Table Workers' is likely to be heavily dependent upon technical advancements in print machinery and software as well as the uptake of this technology by the sector.

Table 5: Projected employment levels for printing and graphic arts occupations

Occupation	Employment level May 2017 ('000)	Projected employment level May 2022 ('000)	Projected employment growth – five years to May 2022 (%)
Printers	12.6	10.5	-16.7
Paper and Wood Processing Machine Operators	6.3	6.3	nil
Print Finishers and Screen Printers	4.9	4.6	-6
Printing Assistants and Table Workers	3.8	3.8	nil
Graphic pre-press trade workers	2.4	2.3	-6

Source: Department of Jobs and Small Business (2017). *2017 Occupational Projections – five years to May 2022*

Note 1: the occupations displayed in the above table are identified as the most relevant occupations to the printing and graphic arts sector, and do not represent all occupations in the sector

The factors contributing to this decline in employment outlook are as follows:

- Ongoing technological improvements such as automation in print technology. As print technology improves, it is likely that fewer workers will be required to produce the same quantity of output.
- Changes in the print technology mix. As the printing industry continues to shift away from offset printing towards digital print technologies, fewer workers directly involved in printing will be required. Digital printing typically requires fewer staff than offset printing due to the higher number of processes involved in offset printing, such as plate preparation, printing, and binding/finishing function.[14]
- The shift towards non-traditional service offerings and new product segments. The printing and graphic arts sector is continuing to experience rapid change, shifting towards services and products not traditionally offered by the 'Printing and Printing Support Services' industry. As this shift continues, it is likely that fewer employees will be captured in the statistical definition of the 'Printing and Printing Support Services'. This shift and its impact will be explored further during industry consultation.

[14] IBIS World (2018), *IBISWorld Industry Report C1611 Printing in Australia*

Supply side challenges and opportunities

An important consideration in determining the magnitude and growth of employment in the printing and graphic arts sector is the supply of graduates trained for work in the sector. Overall, employment is projected to grow moderately across occupations, with a decline for print finishers and screen printers. A full understanding of the future industry direction should also consider how employment demand will be met. This requires an understanding of the factors which are likely to influence the decisions of learners to enrol in printing and graphic arts training and the supply of workers with training in the sector.

Table 6 lists some of the factors which may influence the decision of workers to undertake printing and graphic arts training and enter a role within the sector. It should be noted that, as discussed elsewhere in this Industry Skills Forecast and Proposed Schedule of Work, most of the factors in the below table represent challenges (rather than opportunities) to encouraging participation in the printing and graphic arts workforce. However, this does represent an opportunity to change some of these perceptions through training design, rather than succumbing to them as inevitable.

Table 6: Supply side influences

Supply side influence	Details
Reputation	• There is a public perception that the printing and graphic arts sector offers a poor employment outlook. Part of this reputational issue is poor awareness of what printers actually do and what broader service offerings the printing and graphic arts sector provides. • Research and consultation with the Printing and Graphic Arts IRC has revealed that the sector is often misunderstood by potential workers and career advisors. Furthermore, potential learners are often discouraged from engaging in training, with careers advisors not recommending training in the printing and graphic arts sector as a pathway to employment.[15] • While printing occupations tend not to be highly regarded by society, graphic arts occupations do tend to be highly regarded. On the Australian Socioeconomic Index, printing occupations have a weighted average score of 34 whereas graphic arts occupations have a weighted average score 67 (where the average occupation score is approximately 50 and scores range from a low status of 0 to a high status of 100).[16]
Wages	• Data indicates that Printing and Graphic Arts VET graduates tend to receive wages in line with the average when compared to other VET graduates in their first six months of employment, however, have limited opportunity for wage growth. • In 2017, full-time employed Printing and Graphic Arts VET graduates received an average annual salary of $54,800, compared to an average of $55,000 for all VET graduates.[17] • Progression pathways are often limited due to the prevalence of small or family-owned businesses with little room to develop into more senior roles or ability to invest in employee development.[18]

[15] Julie McMillan, Adrian Beavis, & Frank L. Jones, (2009) *The AUSEI06: A new socioeconomic index for Australia, Journal of Sociology*. Vol 45(2): 123-149.

[16] Julie McMillan, Adrian Beavis, & Frank L. Jones, (2009) *The AUSEI06: A new socioeconomic index for Australia, Journal of Sociology*. Vol 45(2): 123-149.

[17] National Centre for Vocational Education Research (2017) *Total VET activity survey*

[18] Canon (2009) *Digital Printing Directions*, available at <http://www.canon.fr/Images/Insight_Report-v1_0_tcm79-612893.pdf>

Supply side influence	Details
Working conditions	• As relayed by the Printing and Graphic Arts IRC, working conditions in the printing and graphic arts sector vary by occupation. In some occupations such as graphic design, illustration or web-design working conditions are generally good, with little manual labour, stable employment and good employment opportunities with a variety of employers. Some sub-sectors of printing (such as news printing), by their nature, are night or shift work and can be 365 days a year to meet production deadlines. These hours and style of work can negatively impact on employee lifestyle.
Lateral movement	• The IRC has indicated that the older workforce, along with the prevalence of small businesses, can make it difficult for workers to progress upwards or across organisations and does not create space for new workers to enter.
Funding	Funding of VET is a complex and dynamic area. Programs to assist learners undertake training exist at both a state and federal level. For example, the federally funded VET Student Loans program, which replaced the VET-FEE HELP program provides loans to pay tuition fees for VET, applicable to Diploma and Advanced Diploma courses. State and Territory governments also have various programs in place to assist learners undertake training which may vary by jurisdiction, qualification, provider and background of the learner undertaking training. Consultation with IRC members has revealed that government funding for retraining can often be difficult to access. As a result of the same standardised industry or occupation definitions being applied to a number of qualifications within the Printing and Graphic Arts Training Package, qualifications may be seen as equal for the purposes of funding. This may mean for example an offset printer, with an existing printing qualification wishing to retrain in pre-press and front-end application design is unable to access government funding to do so. One part of the complex funding arrangements are to target specific qualifications as priority needs and single out these qualifications for subsidies in addition to other subsidies offered on a non-qualification specific basis (such as for particular cohorts of learners). Each jurisdiction has a different list of identified priorities and ICP qualifications included are listed below (although this does not exclude subsidies being available under other programs): • **New South Wales** – No ICP qualifications are listed on the 'Jobs of tomorrow scholarships eligible qualifications list'. However, the 'NSW Skills List' lists contains all Certificate II and III qualifications in Printing and Graphic Arts, meaning these qualifications are may be eligible for subsidy, depending on the provider. • **Victoria** – All current ICP qualifications are listed on the 'Funded Course Report'. • **Queensland** – Currently, one ICP qualification is listed on the 'Queensland Training Subsidies List'; Certificate II in Printing and Graphic Arts (General). • **Western Australia** – Currently, no ICP qualifications are listed under Future Skills WA 'Priority industry qualifications list'. • **South Australia** – The South Australian 'Subsidised Training List' currently lists available places in Certificate II in Printing and Graphic Arts (General), Certificate III in Printing and Graphic Arts (Print Finishing), Certificate III in Printing, Certificate III in Print Manufacturing and the Certificate III in Print Communications. • **Tasmania** – Currently, a significant number of Printing and Graphic Arts qualifications are listed in the Skills Tasmania 'User Choice – Tasmanian Apprenticeships and Traineeships Listing' • **Northern Territory** – The 'Northern Territory Training Entitlement' currently does not list any ICP qualifications. • **Australian Capital Territory** – Currently, there are no ICP qualifications listed on the 'Skilled Capital Qualification List'. It is acknowledged that this area is complex and a brief summary cannot capture every detail of funding. Depending on a learner's circumstances there may be restrictions to the

Supply side influence	Details
	subsidies listed here and subsidies other than those listed here also be available.

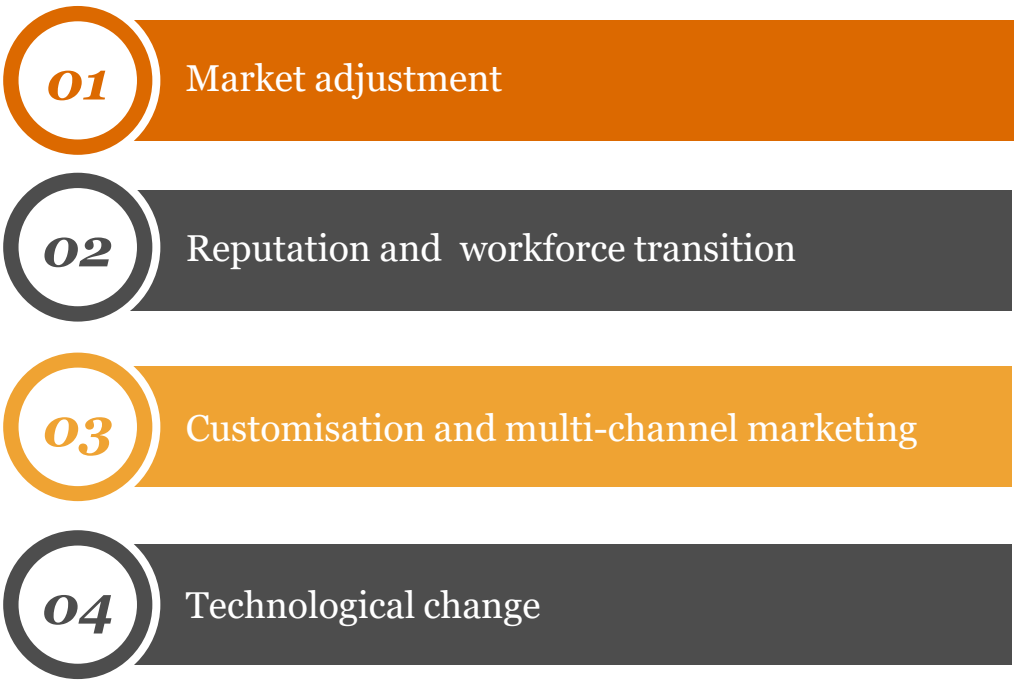
As shown in Table 6 above, the supply side influences are not generally positive in the printing and graphic arts sector. With ongoing advancements in technology and the broadening in end to end service offerings, employees will increasingly require employees that can work across a range of equipment and technologies. Having the right number of people entering the labour market for certain occupations is different to those people having the right future fit skills. This presents an opportunity to attract learners into training that will meet the skills needs of the sector.

The Printing and Graphic Arts Industry Reference Committee have expressed concerns regarding the quality and consistency of the delivery of the ICP Training Package. These concerns are based on a number of factors including, but not limited to; the reputation of VET in the sector, consistency and access to quality teachers and trainers employed by RTOs and how the funding model supports flexibility in response to industry needs, particularly regarding the funding of Skill Sets by State and Territory governments. IRC members have suggested that these factors may contributing to low enrolment numbers in the training package, impacting on graduate employability, and contributing to a decline in interest from industry in taking on apprentices and recent VET graduates. While the ICP Training Package will continually be updated to reflect the needs of the industry, is it believed that progress in terms of industry confidence and enrolment numbers may not be made, or optimised, until these other issues have been addressed.

The following section analyses the trends affecting these potential workers, and how training can ensure the supply of workers is skilled correctly to meet future employment needs.

Key trends shaping the sector

This section outlines **four key trends** shaping the printing and graphic arts workforce over the medium to long term.



1. Market adjustment

The printing and graphic arts sector continues to experience rapid change, largely driven by emerging print technology and the ongoing trend of people increasingly consuming print media through digital platforms rather than physical print.[19] Although some of the sub-classifications within the industry have declined in terms of revenue and employment, this perception is based on a high level view of the industry and does not take into account growth as businesses move into other areas. Many companies are innovating the way they operate and are moving into areas such as communications logistics, multi-channel marketing, advertising, digital design and 3D printing.[20]

The printing and graphic arts sector does not just generate information media, but produces a diverse range of products and services, including:

- The design and production of information media such as books, magazines, newspapers, financial and legal documents
- The strategy, design and production associated with promotional materials such as catalogues, direct mail, brochures and other collateral
- The design and production of packaging products such as labels and printed folding, corrugated and flexible cartons
- Consumer products such as plastic cards, stationery, signage and manufacturing components
- Outdoor advertising products such as display banners
- Omni-channel marketing and communications services, from inception to delivery. This includes developing more accurate and personalised touch points for customers across print, mobile, social and online platforms.[21]

When examining market growth and potential of the sector, it is important to recognise the different factors that may influence demand for all these products.

Data indicates that consumer preference for printed physical media is slowing. Consumers are demanding more convenience and multiple channels for consuming media, driven by the digitisation of traditionally printed mediums such as magazines, newspapers and books.

- Consumer spending on print newspapers is projected to decrease at an annual rate of approximately 6 per cent over the five years from 2017-2021 ($1034 million to $763 million). Over that same period, spending on digital newspapers is expected to grow approximately 21 percent ($248 million to $634 million).[22]
- Similarly the mix of spend advertising between print newspapers and digital newspapers is expected to change, from approximately 79 percent spending in print and 21 per cent in digital in 2016, to 58 per cent and 42 per cent, respectively in 2021.[23]
- Similar trends of a reduction in print and strong growth in digital with print remaining dominant in total size is also predicted in consumer books and magazines.

However, there are trends outside of print media that influence demand in the printing and graphic arts sector.

- **Overall business activity.** Businesses require a range of printed products such as business cards, brochures, documents, report and signs. Therefore, an increase in the total number of businesses tends to

[19] IBIS World (2018), *IBISWorld Industry Report C1611 Printing in Australia*

[20] Print 21 (2017), *Innovation key to survival,* available at <http://print21.com.au/innovation-key-to-survival-piaa-survey/127295>

[21] Canon (2016) The Role of Print in Omni- Channel Marketing, available at <http://pps.csa.canon.com/sites/default/files/papers/CSA-newsletter-cp-10-2016-pros.pdf>

[22] PwC (2016) *Australian Entertainment and Media Outlook 2017-2021: Newspapers*

[23] PwC (2016) *Australian Entertainment and Media Outlook 2017-2021: Newspapers*

positively affect demand for printing services. As the overall number of businesses in Australia is projected to increase, at least in the short term, this is expected to be a driver of demand in the sector.[24]

- **Food manufacturing.** Over the past five years, even as other printing services have slowed, demand for food products that require printed labelling and packaging has grown as a proportion of revenue.[25] There are also areas for potential growth in the printing and graphic arts sector, including environmentally sustainable packaging and packaging that incorporates QR codes to track food products. Anecdotal evidence from IRC members indicates the growth of employment in the food packaging sector.[26]

> *There are areas for potential growth in the printing and graphic arts sector, including environmentally sustainable packaging and packaging that incorporates QR codes to track food products. There has been massive investment into the 'food packaging revolution'*
>
> *Lorraine Cassin, AMWU Print Division*

- **Retail trade.** Retail trade is a large user of print manufacturing, requiring product labels, packaging materials, point-of-sale promotions as well as catalogues and direct-mail advertising. Increased retail trade may drive an increase in demand for these print products.[27]
- **Direct mail.** In retail advertising, direct mail advertising in particular is seen as having high growth potential.[28] This comes after several years of unpopularity and decline, as new technologies are making the customisation of direct mail advertising more easily attainable.[29] Australian consumer research has shown that catalogues, flyers and personalised direct mail ranked above any digital advertising channel in effectiveness.[30] This effectiveness is likely to mean that these physical printed advertising channels are retained by retailers. This view of resurgence of direct mail has been confirmed by consultations with Printing and Graphic Arts IRC members.
- **Emerging product offerings.** Although in many cases, these products currently only make up a small part of the production in the sector, Printing and Graphic Arts IRC members have identified the following emerging product offerings (in addition to the key trends above): vinyl wrap printing, glass and metal printing, display boards and materials, radio frequency identification (RFID) embedded printed product, localised custom web printing.[31]

Another trend that may continue is movement of printing and design services in-house, as opposed to contracting outside printing businesses. Lower costs and the improving quality of smaller machines have made small in-house print runs more economical, reducing demand for external printing services.[32] However, whilst this may appear as a decline in sector activity, it does not necessarily mean a decline in printing and graphic arts occupations. These workers may be brought in-house to non-printing businesses, but will still work in the sector and use the skills that could be contained in the ICP Training Package.

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[24] IBISWorld (2018) *IBISWorld Industry Report C1611 Printing in Australia*

[25] IBISWorld (2018) *IBISWorld Industry Report C1611 Printing in Australia*

[26] Discussed with IRC members at formal SSO and IRC meeting, June 2017

[27] IBISWorld (2018) *IBISWorld Industry Report C1611 Printing in Australia*

[28] Canon (2009) *Digital Printing Directions*, available at <http://www.canon.fr/Images/Insight_Report-v1_0_tcm79-612893.pdf>

[29] Marketing Mag (2014) *Direct mail: have we reached peak saturation or is it still a strong option for marketers*?, available at <https://www.marketingmag.com.au/news-c/direct-mail-have-we-reached-peak-saturation-or-is-it-still-a-strong-option-for-marketers/>

[30] Australia Post (2013) *Creating connections that matter*

[31] Discussed with IRC members at formal SSO and IRC meeting, August 2016.

[32] IBISWorld (2018) *IBISWorld Industry Report C1611 Printing in Australia*

What does this mean for the printing and graphic arts sector workforce?

Job demand	• Potential redistribution from traditional print media to other printing services.
Skills needs	• As the kind of printing and graphic arts products and services demanded changes and redistributes, workers will need agility to move between different kinds of printing or technology and different organisations. For example employees will need to be multi-skilled across a range of equipment and emerging technologies in addition to having knowledge of both traditional print and digital print as it becomes more likely that they will need to work across a range of these areas within the business.

2. Reputation and workforce transition

The ongoing challenge for the printing and graphic arts sector is attracting talent and maintaining a motivated and capable workforce. This appears to be stemming from two core issues as identified below. Combined these issues mean that new talent and skills are not entering the industry at a rate that might otherwise be expected. It is therefore important that any new workers that are being trained will come with the critical and creative thinking skills that will help bring fresh perspectives to the sector.

Perception and reputation of the sector

There are some parts of the printing and graphic arts sector that are in decline due to the popularity and prevalence of digital distribution channels. Whilst there are other sub-sectors with stronger prospects, it is those that are struggling that are publicly seen as core printing business and that receive the most public attention and coverage. This has led to a public perception of an industry that is struggling and caught in the past. Part of this reputational issue is a low amount of awareness of what printers actually do and what broader service offerings the printing and graphic arts sector provides.

Businesses in the printing and graphic arts sector are increasingly innovating and diversifying their product offerings. Greater public awareness of these new innovations is required to promote the positive visibility of the sector and understanding that print will remain an important communication channel in the digital economy, particularly for advertising, education and entertainment.[33]

The concern is that because of a misunderstanding of the sector, potential workers are discouraged from even engaging in training, with careers advisors not recommending the printing and graphic arts sector as a pathway and parents encouraging children to enter university rather than technical qualifications. This perception may need to be addressed before training content is designed, to reposition the public perception of the printing and graphic arts sector. There is a clear need for better communication of pathways in the sector, which are built around entry level apprenticeships at a Certificate III level, with further learning often informal either on the job, through accredited vendor or short course training, or recognition of prior learning.

An ageing and static workforce

Anecdotal evidence from IRC members has indicated that the printing and graphic arts workforce is relatively static, with low turnover. The average worker is older than average and in many cases has less desire to up-skill or progress, and would prefer to stay in a steady position. However, it is recognised that this is not the case for all sub-sectors within the printing and graphic arts sector.

The average age of binders, finishers and screen printers is 44; graphic pre-press trades workers is 45; printers is 44; printing assistants and table workers is 45; and graphic and web designers, and illustrators is 37.[34] This compares to an average age of 39.4 years across all occupations in 2016.[35]

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[33] Future Now (2017), *Industry Workforce Priorities – Industry: Printing*

[34] Australian Bureau of Statistics (2016) *Employee Earnings and Hours, Australia, May 2016, cat. no. 6306.0*, latest update as of 25/02/2018

[35] Australian Bureau of Statistics (2016) *Employee Earnings and Hours, Australia, May 2016, cat. no. 6306.0*, latest update as of 25/02/2018

Although it is recognised that this is not the case in all sub-sectors and businesses in the printing and graphic arts industry, the older workforce, along with the prevalence of small businesses makes it difficult for workers to progress upwards or across organisations and does not create space for new workers to enter. This is creating skills gaps in the overall workforce such as:

- lack of adaptability or openness to new ideas as process is influenced by tradition
- less up to date knowledge as formal training was conducted longer ago
- lack of a cohort of emerging leaders to provide mentorship, which is of particular concern, as when the older cohort all approaches retirement together, there will be no one to guide replacement staff.

With advancements in technology, a decline in traditional processes and the broadening of business offerings, many employers are requiring employees that can be multi-skilled across a range of equipment and emerging technologies. There is a strong need to diversify the current workforce and attract younger people into training and employment in what is an exciting industry.[36]

What does this mean for the printing and graphic arts sector workforce?

Job demand	• Low turnover and static workforce means that employer demand for workers is low. • Reputation and perception of poor employment prospects means that supply of potential employees is also low. • Potential emerging talent gap as current workforce nears retirement.
Skills needs	• Adaptability and creative thinking skills to combat a static and tradition driven workforce. • Leadership, teamwork and mentoring skills to develop new workers entering the sector.

3. Customisation and multi-channel marketing

As some traditional areas of the printing and graphic arts sector decline, organisations will need to respond to stay successful and responsive to market demands. Industry participants will need to think more creatively in seeking markets and pushing boundaries to enter non-traditional service offerings. Based on research and consultations with IRC members, two examples of the industry achieving this have been identified:

- Data driven customisation; and
- Multi-channel marketing.

The major influencer of these new service offerings are consumer demands. As a result, organisations which traditionally sat in the printing and graphic arts sector are expanding and now employ a greater proportion of non-printing roles. However, they are likely to retain printing as a service offering and will still employ workers in core printing and design occupations. It is not anticipated that individuals in these core job roles will be required to become data analysts or marking specialists, however they will need to understand the more diversified businesses in which they sit and their alignment to their organisations. Particularly as workers develop into more senior roles, they will require strong industry awareness, adaptability and collaborative skills.

Data driven customisation

Modern digital printing technologies allow for each individual copy made to have customised graphics and text. This has allowed for new services to be offered by the printing and graphic arts sector including:

- **Targeted promotional materials.** Businesses are able to send more targeted and customised marketing material to individual customers on the basis of demographics or observed preferences.

[36] Future Now (2017), *Industry Workforce Priorities Industry: Printing*, available at <http://www.futurenow.org.au/uploads/2/3/0/4/23042550/futurenow_printing_-_industry_snapshot_may_2017.pdf>

- **Trans-promotional messaging.** Businesses sending letters such as bills are able to include full colour customised targeted advertising messaging as a part of the document.

Variable data printing requires skills in managing the databases from which personalised data is stored, as well as using special purpose layout programs. Customisation will also need an increasing use of data for segmentation and predictive analytics. Whilst the technical analytics may fall outside the realm of job requirements of an ICP graduate, they will need an understanding of the consumer demand for customisation and how it impacts their business.

Personalisation of goods is possible with sophistication of data, giving the consumer an interesting and unique customer experience through print

Kerim El Gabaili, One Point

Multi-channel marketing

In response to demand for traditional print media declining, businesses are refocusing towards multi-channel marketing which includes traditional print as a part of a wider marketing business.

'Multi-channel marketing simply refers to sending out a message utilising more than one communication channel. With so many touch-points available to marketers it is important that the strengths and weaknesses of each communication channel are understood'[37]

Working in a multi-channel context will require workers with broader capabilities incorporating digital graphic design components, marketing skills, and the traditional printing skills.

What does this mean for the printing and graphic arts sector workforce?

Job demand	• It is expected that new service offerings such as customisation and multi-channel marking will create new jobs outside the traditional core printing and graphic arts occupations. However, a core set of printing occupations within these organisations will still remain.
Skills needs	• Traditional print and design workers need to be able to operate in a multi-channel environment, including awareness of industry trends and data availability, collaboration and creative and critical thinking.

4. Technological change

The printing and graphic arts sector is heavily reliant upon printing hardware and software, both of which are continuing to change.[38] Technological changes are continuing to alter the roles in which people work and the service offerings of the industry. Such technological change is further stimulated by Australia's relatively high labour costs, which drive automation trends such as in manufacturing print lines. Three major changes have been identified:

- **Shift in printing technology from offset to digital.** Increased uptake of digital printing is changing the skills required to operate equipment.
- **On demand printing.** Cost-effective technology enables the industry to offer new services to book publishers and individuals.

[37] Bright Print Group (2015) *Multi-Channel Marketing*, available at <http://www.brightprintgroup.com.au/main/index.php/services/integrated-marketing>

[38] Average annual capital expenditure by the Australian printing industry is $215 million (5 years to Dec 2015). Australian Bureau of Statistics (2016) *5625.0 Private New Capital Expenditure and Expected Expenditure, Australia*

- **3D printing.** Presents a significant growth opportunity for the printing and graphic arts industry.

Shift in printing technology from offset to digital

The continued shift towards digital print technology is altering the types of print products produced by the Australian printing and graphic arts sector as well as the nature of employment within the industry.

Historically, the sector has been mainly comprised of offset printing, producing large volume printed products at a low unit cost.[39] The industry is now shifting towards newer digital printing technologies such as commercial inkjet printing. This is also reflected in student enrolments, with a decrease in enrolments in traditional offset units of competency.[40]

Digital technologies continue to be the dominant source of growth in the printing industry.[41] Developments in inkjet methods will see the fastest growth in digital processes across 2017-2022 in the global printing industry, leaving the previously dominant offset lithographic declining in value. In 2017, digital printing accounted for 2.9 per cent of global print market volume and is expected to accelerate to 3.9 per cent by 2022, whereas in the same time period, offset lithographic is expected to decline from 48.1 per cent to 39.5 per cent.[42]

Shifting towards digital printing technology has enabled reduced print run lengths. Figure 4 shows that shorter run jobs are making up a larger proportion of total print volumes in recent years, with estimates indicating this trend is likely to continue. As a result of the shift towards shorter print runs, the nature of employment within the sector is changing in a number of ways:

- **Fewer technical staff involved directly in printing.** Digital printing typically requires fewer staff than offset printing due to the higher number of processes involved in offset printing, such as plate preparation, printing, and the binding and finishing function.[43]
- **A shift towards customer facing roles.** Shorter digital print runs require the same amount of time to be spent working directly with customers to determine specifications, costing, billing, etc. However, because fewer copies are produced, less time needs to be spent on the actual printing, binding and finishing of documents, although it is likely that higher level skills will be required for workflow management, with enhanced skills required at the front-end. This means that a greater proportion of workers' time is likely to be devoted to customer facing functions.
- **Increased focus on quick turnaround.** Time frames are typically far shorter with digital printing compared to offset printing. This has led firms to offer rapid-turnaround printing services, requiring workers to have precise time management and prioritisation skills.[44]

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39 Canon (2009) *Digital Printing Directions*, available at <http://www.canon.fr/Images/Insight_Report-v1_0_tcm79-612893.pdf>

40 National Centre for Vocational Education Research (2017), *Total Student Enrolments*

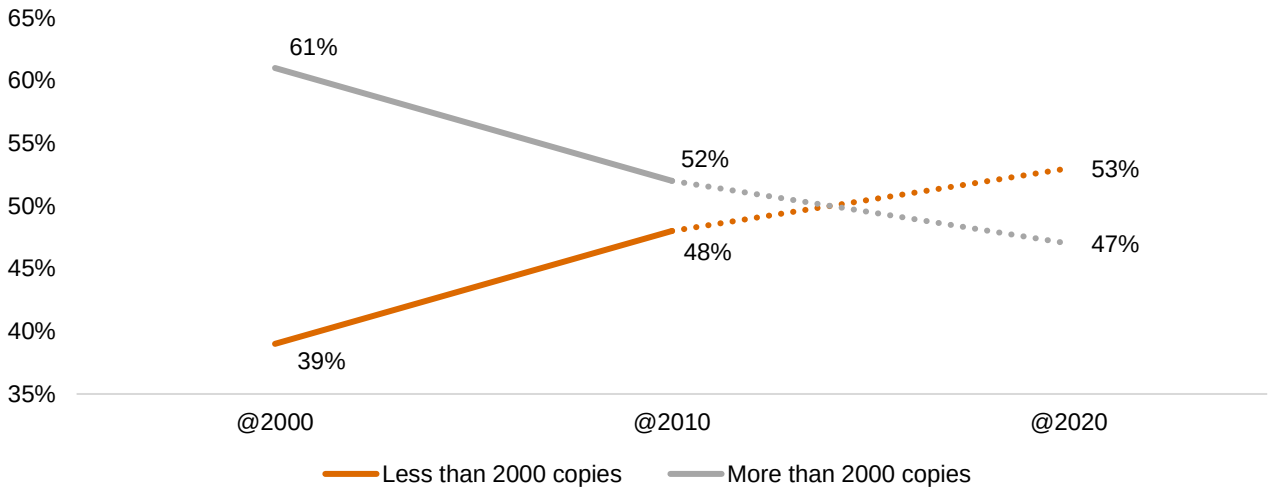
41 Drupa (2016) *2nd Global trends report*, available at <http://www.drupa.com/cipp/md_drupa/custom/pub/content,oid,32300/lang,2/ticket,g_u_e_s_t/~/2nd_drupa_Global_Trends_report.html>

42 Smithers (2017), *Packaging is the growth engine for global print,* available at <https://www.smitherspira.com/resources/2017/september/digital-vs-offset-printing>

43 Queensland Government (2005) *Queensland Government Department of Public Works Phase 2 Report: Goprint*

44 Canon (2009) *Digital Printing Directions*, available at <http://www.canon.fr/Images/Insight_Report-v1_0_tcm79-612893.pdf>

Figure 4: Changes in print run length 2000 to 2020



Source: Canon (2009) *Digital Printing Directions*

On demand printing

Advancements in print technology are changing the structure of the book printing industry. Historically, books could only be produced cost-effectively if thousands of copies were produced. However, newer printing technology has made printing individual books more viable. This is giving rise to two new product categories:

- **Print on demand.** Book retailers and publishers are increasingly able to offer titles which are printed as customers order. Rather than holding a large inventory of titles which are infrequently purchased, retailers and publishers can hold digital copies of all titles and print books as orders are received. This enables retailers to both increase the size of their back list as well as reduce costs of holding an inventory of titles which are infrequently purchased.[45]
- **Vanity publication.** Digital printing technology has also allowed the printing industry to offer low volume book publication services to individuals. Using digital print technology, it is possible to produce individual copies of books for customers such as hobbyists wishing to have their works published professionally.

These new service offerings are likely to require workers in the industry to deal increasingly with new types of customers. These may include small niche or technical publishers using print on demand services and individuals wishing to have their works published.

3D printing

3D printing (also referred to as additive manufacturing) is expected to become a key growth area within the global economy, with the market for 3D printing equipment and services estimated to grow from US$2.5 billion in 2013 to US$16.2 billion in 2018.[46] One Australian technology specialist, Steve Sammartino, has predicted that 3D printing will have an even bigger impact on economies and society than the internet.[47] Recent developments in the sector include innovations in renewable energy, with the University of Newcastle's 3D printing water-based solar paint to improve solar panel technology,[48] and in medical devices, with 30 per cent

[45] The Conversation, Zoe Sadokierski (2014) *Shelf Promotion: how everyone can be a publisher with print-on-demand book,* available at < https://theconversation.com/shelf-promotion-how-everyone-can-be-a-publisher-with-print-on-demand-books-30923>

[46] PwC (2014) *The road ahead for 3-D printers,* available at <http://www.pwc.com/us/en/technology-forecast/2014/3d-printing/features/assets/pwc-3d-printing-full-series.pdf>

[47] Sarah Sedghi and Eleanor Hall (2015) *3D printing will have a bigger economic impact than the internet, technology specialist says, ABC News Online*

[48] The University of Newcastle (2016) Newcastle University's Solar Panel Painting

of internal medical implants and devices to be 3D printed by 2020.[49] Furthermore, there have been innovations in aerospace manufacturing with Monash University producing the world's first 3D printed jet engine in just four months.[50] These skills opportunities are currently being explored through the 3D printing Case for Endorsement.

The applications for 3D printing range across industries and traditional occupation roles. 3D printing draws on digital design, manufacturing, ICT and visual arts skills and has potential implications on all industries, from health to infrastructure to artistic expression. It is expected that applications will continue to be discovered as the technology becomes more widespread, but its potential can be seen in the uses already being explored. Examples include:

- **Changing the way that new products are developed**. For example, the use of 3D printing can reduce development time by up to 96 per cent and can produce products that are built in one part, reducing construction requirements and making complex components that cannot be made with conventional method.[51]
- **Reducing manufacturing costs.** For example, the use of 3D printing in manufacturing can reduce costs by up to 40 per cent by removing expensive and complex components of conventional manufacturing and allowing the customisation of goods based on customer demand.[52]
- **Exploration of medical implications**. For example, a 3D printed bio-ceramic implant to assist osteoarthritis sufferers,[53] or 3D printed heart models that can assist doctors in diagnosis and treatment planning,[54] and even the exploration of printing live cells.[55] In addition, the development of 3D printed dentures and temporary crowns, and even "bio printing," where 3D implants function as normal anatomical structures until native cells are repaired and replace the implant automatically so no artificial implant remains – reducing both the cost and pain of traditional surgeries for patients. [56]
- **Expansion into different printing mediums**. Including materials which can result in 4D printed objects, which are those that be respond to their environment, such as materials that respond to heat or moisture levels.[57]

Not all roles to do with 3D printing will be reskilling of the existing printing and graphic arts workforce. The skills required are comprehensive, creating opportunity for individuals from varied backgrounds. 'Actually translating your designs into physical objects takes more work and a broader skill set that requires a combination of maths, programming, art or design, materials science, and mechanical engineering'.[58]

However, the commercial printing industry is well positioned to capitalise on some parts of this growth. Many of the skills required to produce 3D printed objects are part of the key competencies held by workers in the commercial printing industry, namely:

- Advising as to suitability of different production techniques, materials and substrates
- Job costing

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[49] 3D Printer and 3D Printing News (2017) *Gartner: 3D printing to accelerate in manufacturing industries in 2017*

[50] Monash University (2017), *Monash University Jumps into Space Age with 3D printed rocket machine*, <available at <https://www.monash.edu/news/articles/monash-university-jumps-into-space-age-with-3d-printed-rocket-engine2>

[51] The Conversation (2013) *Can 3D printing rebuild manufacturing in Australia?*

[52] Pacific Consulting Group (2017), *What does 3D printing mean for Australian business?, available at* <http://www.pacificconsultinggroup.com.au/pcg-insights/case-studies/what-does-3d-printing-mean-for-australian-business/>

[53] 3Ders (2016) *3D printed bioceramic implants for bone repair to enter market soon*, available at <http://www.3ders.org/articles/20160411-3d-printed-bioceramic-implants-for-bone-repair-to-enter-market-soon.html>

[54] Bridget Butler Millsaps (2016) *Nothing short of amazing: The 3D printed heart library at jump trading center benefits everyone*, available at <https://3dprint.com/127777/3d-printed-heart-library/?>

[55] Virginia Harrison (2015) 3-D *printers could soon make human skin*, available at <http://money.cnn.com/2015/06/17/technology/3d-bioprinting-skin/>

[56] Australian Government Department of Health (2017), *Proposed Regulatory Changes Related to Personalised and 3D printed Medical Devices*

[57] Science Alert (2014) *4D printing create structures that self-assemble*, available at <http://www.sciencealert.com/watch-4d-printing-creates-structures-that-self-assemble>

[58] The Conversation (2013) *Can 3D printing rebuild manufacturing in Australia?*

- Preparation of digital files for printing (pre-print and pre-flighting)
- Setup of complex machinery
- Maintenance of machinery.

The commercial printing industry is also likely to have the scale needed to provide the significant capital outlay required to purchase higher quality, higher volume 3D printing equipment (with some higher quality 3D printing equipment ranging in price from $250,000 to $750,000).[59] This is likely to give the commercial printing industry both a cost and quality advantage over small scale desktop production, particularly in larger scale production runs of 3D printed objects.

A lot is happening in the Print 3D space, biotechnology – we're now printing skin cells and bionic hands … it's an interesting, progressive and changing industry

Michelle Lees, HP PPS Australia Pty Ltd

The Australian printing industry may look to capitalise upon the predicted growth in the 3D printing industry, however to do so, a skilled workforce with the necessary skills in 3D printing will be critical.

The developments in 3D printing also raise concerns with an increasing demand for ethical printing required, with current Intellectual Property rights insufficient in encapsulating 3D printing copyright and trademark laws.[60] Through 3D printing, extensive personal manufacturing of copyrighted objects without authorisation can occur with computer-aided design (CAD) files readily available on the Internet.[61] Furthermore, due to the decentralised production process of 3D printing, issues arise in regards to who holds the design right and patent protection – with some individuals creating the blueprint and others digitally modelling it. These ethical issues also emerge in 3D bio printing, where the use of viable living cells to print human organs is sparking intellectual property concerns as well as issues regarding safety and accessibility to middle-class economies. A robust portfolio of intellectual property rights will thus need to be established to allow the sector to be protected and grow in the long term.

[59] Australian Broadcasting Corporation (2014) *3D printing seen as manufacturing route for the future*, available at <http://www.abc.net.au/news/2014-10-13/3d-printing-seen-as-manufacturing-route-for-the-future/5807984>

[60] World Intellectual Property Organisation (2017), 3D Printing and IP Law, available at < http://www.wipo.int/wipo_magazine/en/2017/01/article_0006.html>

[61] Intellectual Property Watch (2017), Inside views: to print or not to print – Innovations and IP issues in 3D printing, available at < https://www.ip-watch.org/2017/07/19/print-not-print-innovation-ip-issues-3d-printing>

What does this mean for the printing and graphic arts sector workforce?

The continual and rapid evolution of printing processes and software means that workers in the industry are likely to need to adapt to ongoing technological change.

Job demand	• Workers will need to be able to shift jobs within the printing industry, as focus shifts towards digital printing and new printing market segments.
Skills needs	• Up to date digital printing skills (rather than traditional offset printing skills) are essential as the industry moves towards a greater proportion of digital printing. • Workers in the printing industry need to be flexible and able to adapt to change and upskilling of current employees in new technologies may also be required. • Understanding of 3D printing technology and services.

Creating a future fit workforce

Using feedback from stakeholders and the data available, five priority skills have been identified for the ICP Training Package (Table 7). This list is an assessment of the priority areas for development following an assessment of key trends and the state of the Training Package. It is recognised that these skills are cultivated to varying extents in the sector, but feedback suggests they are of ongoing critical importance.

It is important to note that, due to the pace of change in technology and consumer preferences, required technical skills in the sector are changing. PwC's Skills for Australia and the IRC intend to continue to consult with industry to understand what these new and emerging technical skills are, with a particular focus on the delineation of skills in screen printing compared to wide format, and the variety of skills required for 'hard output', 'processing' and other variations of 3D printing.

Table 7: Priority skills in the printing and graphic arts sector

	Skill	Definition	Rationale
1	Industry knowledge	Understanding of the broad industry and trends, as well as the ability to research and absorb new information to keep up to date with industry trends.	• As highlighted in the trends analysis, different parts of the sector are contracting, growing or transforming in response to external factors. This will include a general understanding of the growing use and importance of data in business decision making, recognising that there will be other more specialised occupation roles that will undertake this analysis. • Increased industry awareness of workers is likely to lead to adaptability and sustainability of the industry itself, allowing it to adapt to changes outlined in the trends shaping the sector.[62]
2	Career and development planning	Ability to plan one's own career (or own business) in a changing industry environment by self-assessing skills and planning development and progression.	• With the above knowledge of the industry, workers will also need the skills to self-assess and plan their own careers in this changing environment. • This will build upon industry knowledge and help identify the opportunities to diversify, as well as where there is a need for core printing services.
3	Creative, commercial and critical thinking	Ability to be creative and use problem solving skills in difficult	• Although it may not be the case in all sub-sectors of the printing and graphic arts industry, IRC feedback suggests that many workers (including managers) in the sector do not have the skills to recognise problems, isolate the root-cause of that

[62] Consultation with IRC members

	Skill	Definition	Rationale
		situations.	problem and then find and implement the solution. These core problem solving skills are important to any technician or manager working in the sector, however IRC feedback suggests that these skills are currently lacking in the Training Package. However, it is also recognised that this may not be the case for all sub-sectors within the printing and graphic arts industry. • These skills are not about the printing and graphic arts workforce taking on different roles but about being able to undertake the same roles by bringing problem solving skills alongside technical expertise.
4	Collaboration and relationship building	Ability to build working relationships and collaborate within an organisation that may be broad ranging in its service offerings, but required different parts of the business to work together. This includes communication techniques for identifying and working with different personalities.	• These communication skills go hand in hand with industry knowledge and understanding to allow workers in the sector to operate to the best of their ability in changing environments. • As organisations in the sector begin to offer broader service offerings, workers will need to collaborate with the broader teams. • These skills are seen as particularly important to develop in the printing and graphic arts sector because of the static workforce and reputation of the industry. Ability to collaborate meaningfully feeds in to the values and culture of the sector. Strong interpersonal skills and ability to communicate the value of the sector will help to attract talent and change the standing of the sector.
5	Agility and flexibility	The ability to respond well to change and embrace new roles and technologies.	• Changing technology and preferences is requiring workers in the printing and graphic arts sector to 'top-up' their skills to keep up to date with change. • ICP graduates will need adaptability and flexibility so that they can move seamlessly between sub-sectors or organisations that may not have their core business in the sector, but still require printing and graphic arts skills. • This agility will also include the ability to be autonomous and self-directing in a changing sector. • Agility, together with problem solving skills, will make workers more open and able to understand new technologies, and their associated applications and benefits to their specific field. This will enable the sector to harness the possibilities of technological change.

In addition to skill priorities identified in this section, the IRC is required to rank a supplied list of 12 generic workforce skills (supplied by the Department) in order of importance to relevant employers. For the printing and graphic arts sector, these skills have been ranked below in Table 8.

All skills listed in Table 8 are important. Low ranking does not imply that the skill is not important, but rather lower ranking only indicates that these skills are not critical priorities for the printing and graphic arts sector. Further, Table 8 also only shows rankings of importance as an average across the whole sector, some skills may have higher or lower importance for particular organisations and particular sub-sectors. Note that these skills are read in line with definitions provided by the Department.

Table 8: Ranking of key generic workforce skills

Importance	Generic workforce skill
1	Learning agility/Information literacy/Intellectual autonomy and self-management
2	Customer service/Marketing
3	Technology use and application
4	Environmental and sustainability
5	Language, literacy and numeracy (LLN)
6	Communication/Collaboration including virtual collaboration/Social intelligence
7	Design mindset/Thinking critically/System thinking/Solving problems
8	Data analysis
9	Managerial/Leadership
10	Financial
11	Science, technology, engineering and maths (STEM)
12	Entrepreneurial

Please note that the Printing and Graphic Arts Industry Reference Committee feel that ranking these generic workforce skills undermines the purpose of the Industry Skills Forecast. The Industry Reference Committee believe that the skills listed are all crucial for individuals who are employed in the printing and graphic arts sector and that therefore they are all critical priorities. In addition, the ranking of the skills as an "average across the subsectors" is difficult due to the diversity of job roles in the industry. The Industry Reference Committee conclude that the ranking exercise does a disservice to the importance of these skills, whilst acknowledging that the exercise is a requirement of the Industry Skills Forecast and Proposed Schedule of Work.

C. Key Drivers for Change and Proposed Responses

Design, marketing and other pre-press technical UoCs

Section C and D effectively serve as the case for change for this project; 1c design, marketing and other pre-press technical UoCs project, scheduled in 2018-2019:

• Section C outlines the key drivers for change and how they will be reflected in 2018-19 training product development work.
• Section D outlines the status of 2016-17 projects and the proposed schedule of work through to 2019-20. It also contains the 2018-19 project details including rationales behind projects, Ministers' priorities addressed, consultation plans and the scope of the projects.

The Printing and Graphic Arts IRC has prioritised Design, Marketing and other Pre-press Units of Competency as a key area for review in 2018-19, given that the review will address a key emerging trend related to market adjustment.

Four key drivers for change have been identified below in addition to an outline of proposed training product responses and the impact on stakeholders informed through consultations with industry. We have gathered multiple perspectives from industry stakeholders on the proposed training package responses which are not expected to have a major impact on any particular stakeholder group(s), given their limited scope. It is important to note that the Printing and Graphic Arts Training Package underwent a significant restructure relatively recently, so excessive change is not recommended.

The following drivers are impacting on the industry's ability to react and adapt to change in addition to shifting the skills needs required by the industry.

Table 9: Design, marketing and pre-press Key Drivers for Change

	Key driver for change
1	**Organisations are placing a greater emphasis on marketing and sales and data driven customisation.** Employees will now commonly require both core printing and non-traditional knowledge and skills to deliver on new service offerings. In order for businesses to remain adaptable and flexible to changing roles, an increased customer focus and the ability to customise services is necessary in addition to an understanding of how this refocus will impact on the overall business.[63] The Training Package needs to anticipate and cater for this shift by ensuring that the traditional manufacturing focus is combined with a focus on service. Marketing and sales skills are also becoming increasingly pertinent to printing and graphic arts businesses in addition to the move to customisation as the market continues to shift toward providing an end-to-end service for customers. Industry stakeholders have emphasised that the pace of change is unlikely to slow, thus adaptability and flexibility are critical skills for learners and workers moving into new or changed roles.

Proposed Responses

The following is proposed in response to the above key industry driver for change:

[63] IBIS World Industry Report C1612 (2017) *Printing Support Services in Australia.* Hayley Munro-Smith.

Table 10: Proposed responses

Proposed Responses
1 **Update existing UoCs related to sales and marketing** in light of industry needs with close consideration of existing units from other Training Packages which could potentially be imported into the current package **and/or the development of a new skill set** focused on capability uplift in sales and marketing. It is anticipated that imported Units will be relied on to address the needs of the Printing industry in this regard.
2 **Develop one skill set in graphic design with a print production focus**. It is anticipated that this will allow individuals to move from design fields into the printing and graphic design field which will allow for the upskilling of individuals. This skill set will comprise of both native and imported Units of Competency to ensure they are consistent with the blend of skills required by employers.

Implication of proposed response for stakeholders

Table 11 provides a description of all expected impacts relative to stakeholders, given the proposed responses.

Table 11: Implication of proposed response for stakeholders

Stakeholder	Impact
Industry/employers	Potential employees have current and relevant skills, less 'on-the-job' training required, improved options for upskilling and reskilling that can be accessed by employees, and easier recognition of qualifications and the accompanying skills that can be expected
Employees	Improved employability and job readiness, less 'on-the-job' training required, improved options for upskilling and greater recognition of qualification and skill level
Learners	Pathways to transition between sub-sectors, increased breadth of knowledge, increased currency and relevance of skills
RTOs	Increased opportunity to offer relevant, industry supported training
Other IRCs/Training Packages	Impacts are not expected to be significant.

Implication of proposed response for occupations in the industry

It is anticipated that the proposed changes will impact on those in:

- Design related fields
- Graphic design
- Generalist and niche printing businesses
- Organisations with in-house printing capabilities

Risk of not proceeding with proposed response

The base case (the 'do nothing') option must be considered as an alternative to the proposed changes in order to enable effective comparison between the two scenarios. This option negates the need for investment in training products, however does not address the current state issues identified. The likely impacts of this option are outlined below:

Likely impact (s) if not addressed
• **Ongoing confusion and uncertainty** about the specific value of ICP qualifications due to generalist nature and lack of structure

Likely impact (s) if not addressed
• **Learners being trained in obsolete technologies**, undermining training value as well as employment outcomes and ability to contribute to the workforce • **Current skills gap** in understanding design for different types of printers will not be addressed, leaving some graphic designers not fully equipped to adapt to different technologies and channels • **Missed opportunity to improve competitiveness** of printing businesses by equipping new and upskilling workers in the importance of sales and marketing skills in training • **Missed opportunity to streamline and modernise** the ICP Training Package by removing Units that are no longer required by industry, many of which are barely used.

Table 12: Key Drivers for Change

Key driver for change
1 **A reduction in offset printing technology and the shift to digital printing is changing skills needs in the industry.** Technological changes such as the uptake of digital printing technology and the shift away from offset printing are resulting in an increasing shift towards digital printing due to advantages including: • lower cost for small print runs • faster production times[64] • less staff hours required per print run This shift in technology means that some skills currently embedded within the Training Package are becoming obsolete or no longer requiring formal training. Additionally, there are non-traditional areas of growth within the printing industry which are not well captured by current data due to their recent emergence. The traditional scope of the printing industry data does not reflect areas of growth such as food labelling, 3D printing, on demand printing, environmentally sustainable packaging, vinyl wrap/metal/glass printing, and RFID embedded printing which are growing in demand and relevance.

Proposed Responses

The following is proposed in response to the above key industry driver for change:

Table 13: Proposed responses

Proposed Responses
1 **Update or delete existing UoCs** that have been identified by industry as being out of date, not fit for implementation, duplicative, or no longer required**.** For example those related to offset printing skills and technology where they are no longer current or required. 2 **Develop new UoC** to address identified skills gap in advanced use of graphic application skills and knowledge.

Table 14: Implication of proposed response for stakeholders

Stakeholder	Impact
Industry/employers	Potential employees have current and relevant skills, less 'on-the-job' training required, improved options for upskilling and reskilling that can be accessed by

[64] Canon (2009) *Digital Printing Directions*, available at <http://www.canon.fr/Images/Insight_Report-v1_0_tcm79-612893.pdf>

Stakeholder	Impact
	employees, and easier recognition of qualifications and the accompanying skills that can be expected
Employees	Improved employability and job readiness, less 'on-the-job' training required, improved options for upskilling and greater recognition of qualification and skill level
Learners	Pathways to transition between sub-sectors, increased breadth of knowledge, increased currency and relevance of skills
RTOs	Increased opportunity to offer relevant, industry supported training
Other IRCs/Training Packages	Impacts are not expected to be significant. The cross sector impacts of any unit deletion will be closely considered (for example ICPDMT296 Create and test an interactive CD-ROM/DVD has been identified for potential deletion, a unit currently used within Culture and Related Industries qualifications).

Implication of proposed responses for occupations in the industry

It is anticipated that the proposed changes will impact on those in:

- Design related fields
- Graphic design
- Generalist and niche printing businesses
- Organisations with in-house printing capabilities

Risk of not proceeding with proposed responses

The base case (the 'do nothing') option must be considered as an alternative to the proposed changes in order to enable effective comparison between the two scenarios. This option negates the need for investment in training products, however does not address the current state issues identified. The likely impacts of this option are outlined below:

Likely impact (s) if not addressed
• **Ongoing confusion and uncertainty** about the specific value of ICP qualifications due to generalist nature and lack of structure • **Learners being trained in obsolete technologies**, undermining training value as well as employment outcomes and ability to contribute to the workforce • **Current skills gap** in understanding design for different types of printers will not be addressed, leaving some graphic designers not fully equipped to adapt to different technologies and channels • **Missed opportunity to improve competitiveness** of printing businesses by equipping new and upskilling workers in the importance of sales and marketing skills in training • **Missed opportunity to streamline and modernise** the ICP Training Package by removing Units that are no longer required by industry, many of which are barely used.

Table 15: Key Drivers for Change

	Key driver for change
1	**Low uptake of enrolments and RTO availability.** There is a common misconception that with the decline of traditional offset printing comes the decline of the printing industry. In fact there are emerging new roles and opportunities that are leading to a transition of the industry and not a decline. At a time when

Key driver for change
the industry is undergoing radical changes, attracting young innovative talent is vital to the growth of the industry. The key inhibitors of enrolments and training availability include: • limited earning trajectories for ICP graduates[65] • limited opportunities for progression[66] • poorly perceived work-life balance for some sub-sectors (e.g. news printing) In light of these key issues, it is important that the training package offers contemporary training products that highlights the potential for innovation, and opportunity to partake in high growth new technological fields (e.g. 3D printing).

Proposed Responses

The following is proposed in response to the above key industry driver for change:

Table 16: Proposed responses

Proposed Responses
1 **Updating packaging rules of one qualification:** Certificate III in Print Communication as per industry feedback, with a focus on industry relevance and realistic delivery. 2 **Update or delete existing UoCs** that are out of date, not fit for implementation or where nil- very low enrolment numbers indicate possible obsolescence. 3 This will also **consider the UoCs proposed for inclusion in the skill sets**, and consideration of marketing and sales related UoCs in light of the industry needs in this area.

Table 17: Implication of proposed responses for stakeholders

Stakeholder	Impact
Industry/employers	Potential employees have current and relevant skills, less 'on-the-job' training required, improved options for upskilling and reskilling that can be accessed by employees, and easier recognition of qualifications and the accompanying skills that can be expected
Employees	Improved employability and job readiness, less 'on-the-job' training required, improved options for upskilling and greater recognition of qualification and skill level
Learners	Pathways to transition between sub-sectors, increased breadth of knowledge, increased currency and relevance of skills
RTOs	Increased opportunity to offer relevant, industry supported training
Other IRCs/Training Packages	Impacts are not expected to be significant. The cross sector impacts of any unit deletion will be closely considered (for example ICPDMT296 Create and test an interactive CD-ROM/DVD has been identified for potential deletion, a unit currently used within Culture and Related Industries qualifications).

Implication of proposed responses for occupations in the industry

It is anticipated that the proposed changes will impact on those in:

[65] National Centre for Vocational Education Research (2017) *VET student outcomes survey*

[66] Canon (2009) Digital Printing Directions, available at <http://www.canon.fr/Images/Insight_Report-v1_0_tcm79-612893.pdf>

- Design related fields
- Graphic design
- Generalist and niche printing businesses
- Organisations with in-house printing capabilities

Risk of not proceeding with proposed responses

The base case (the 'do nothing') option must be considered as an alternative to the proposed changes in order to enable effective comparison between the two scenarios. This option negates the need for investment in training products, however does not address the current state issues identified. The likely impacts of this option are outlined below:

Likely impact (s) if not addressed
• **Ongoing confusion and uncertainty** about the specific value of ICP qualifications due to generalist nature and lack of structure • **Learners being trained in obsolete technologies**, undermining training value as well as employment outcomes and ability to contribute to the workforce • **Current skills gap** in understanding design for different types of printers will not be addressed, leaving some graphic designers not fully equipped to adapt to different technologies and channels • **Missed opportunity to improve competitiveness** of printing businesses by equipping new and upskilling workers in the importance of sales and marketing skills in training • **Missed opportunity to streamline and modernise** the ICP Training Package by removing Units that are no longer required by industry, many of which are barely used.

Table 18: Key Drivers for Change

Key driver for change
1 **Printing organisations are specialising in niche markets in order to stand out.** The printing and graphic arts sector is rapidly evolving and organisations within the sector are required to be innovative in their service delivery in order to stay competitive[67]. As technology progresses, the printing equipment and software is becoming more cost-effective, accessible, and user-friendly; inclining businesses to turn to in-house printing rather than outsourcing the work to industry firms[68]. This development has enhanced repercussions for smaller firms, as smaller printing jobs are the most likely to be transferred to in-house. The industry is highly fragmented with 94.8% of firms hiring less than 20 employees[69]. In response to the market conditions, printing firms are finding that they need to differentiate themselves by either specialising in a niche area or delving into non-traditional printing services to provide a comprehensive end-to-end experience for customers. Examples of areas that printing organisations are specialising in include: • Design and production of a specific media (e.g. books, magazine, newspapers, financial papers, legal documents or photo books) • Design and production of specific packaging products (e.g. labels, corrugated cartons or flexible cartons) • Design and production of marketing products (e.g. signage, vinyl wrap for vehicles and display banners) Each of these areas of print requires a technical skill set and as such it is important that training is allowing learners to gain and communicate their skills in their area of employment or prospective employment.

[67] Print 21 (2017), Innovation key to survival, available at <http://print21.com.au/innovation-key-to-survival-piaa-survey/127295>

[68] IBIS world (2018) *IBISWorld Industry Report C1611 Printing in Australia*

[69] IBIS world (2018) *IBISWorld Industry Report C1611 Printing in Australia*

Multiple Training Package restructures in the past decade have reduced the number of qualifications offered from over 40 to just eight qualifications[70]. As a result qualifications tend to be generalist, without specification of niche or technical skills. For example:

Table 19: Qualification mapping

New qualification (ICP)	Previous qualifications (ICP10)
Certificate III in Printing	• Certificate III in Printing and Graphic Arts (Screen Printing) • Certificate III in Printing and Graphic Arts (Digital Printing) • Certificate III in Printing and Graphic Arts (Printing)

While a streamlined Training Package is essential, there is currently limited opportunity for learners to indicate their specialist skills easily to prospective employers. This is leading to industry confusion as to what outcomes individuals are achieving as part of the general qualifications.

Proposed Responses

The following is proposed in response to the above key industry driver for change:

Table 20: Proposed responses

Proposed Responses
1 **Develop five skill sets** to enable reskilling, upskilling and specialisation focused on flexographic printing, lithographic printing, wide format digital print, sheet-fed digital print and ePublishing. These skill sets will provide clear options for reskilling, upskilling, and specialisation within the industry and will be comprised of both native and imported Units of Competency to ensure they are consistent with the blend of skills required by employers.
2 **Import existing UoCs related to marketing and sales** from other training packages, where appropriate.
3 **Update existing UoCs** where necessary to ensure their currency and the removal of units which are no longer required by industry or that have been identified by industry as being out of date, not fit for implementation, duplicative, or no longer required will be undertaken. These updates will also consider the Units proposed for inclusion in the skill sets, and consideration of marketing and sales related Units in light of the industry needs in this area.

Table 21: Implication of proposed responses for stakeholders

Stakeholder	Impact
Industry/employers	Potential employees have current and relevant skills, less 'on-the-job' training required, improved options for upskilling and reskilling that can be accessed by employees, and easier recognition of qualifications and the accompanying skills that can be expected
Employees	Improved employability and job readiness, less 'on-the-job' training required, improved options for upskilling and greater recognition of qualification and skill level
Learners	Pathways to transition between sub-sectors, increased breadth of knowledge, increased currency and relevance of skills
RTOs	Increased opportunity to offer relevant, industry supported training
Other	Impacts are not expected to be significant. There is potential that the unit proposed

[70] Training.gov.au (accessed February 2018) ICP05, ICP10 and ICP Training Package Details

Stakeholder	Impact
IRCs/Training Packages	for creation may be relevant to some learners enrolled in other training packages with elements of design, and this will be considered throughout the development process. The cross sector impacts of any unit deletion will be closely considered (for example ICPDMT296 Create and test an interactive CD-ROM/DVD has been identified for potential deletion, a unit currently used within Culture and Related Industries qualifications).

Implication of proposed responses for occupations in the industry

It is anticipated that the proposed changes will impact on those in:

- Design related fields
- Graphic design
- Generalist and niche printing businesses
- Organisations with in-house printing capabilities

Risk of not proceeding with proposed responses

The base case (the 'do nothing') option must be considered as an alternative to the proposed changes in order to enable effective comparison between the two scenarios. This option negates the need for investment in training products, however does not address the current state issues identified. The likely impacts of this option are outlined below:

Likely impact (s) if not addressed
• **Ongoing confusion and uncertainty** about the specific value of ICP qualifications due to generalist nature and lack of structure • **Learners being trained in obsolete technologies**, undermining training value as well as employment outcomes and ability to contribute to the workforce • **Current skills gap** in understanding design for different types of printers will not be addressed, leaving some graphic designers not fully equipped to adapt to different technologies and channels • **Missed opportunity to improve competitiveness** of printing businesses by equipping new and upskilling workers in the importance of sales and marketing skills in training • **Missed opportunity to streamline and modernise** the ICP Training Package by removing Units that are no longer required by industry, many of which are barely used.

Sensitivities raised in consultation

A number of sensitivities were raised during consultations which will be important to consider throughout the review of the ICP training package, including:

Table 22: Sensitivities raised in consultation

Sensitivity	Likely impact(s)
Stakeholder fatigue associated with review	• Stakeholders expressed over-consultation can be a potential concern across sub-sectors. Saturation of consultation across the ICP sector has the potential to affect the number and variety of stakeholders willing to contribute to projects and training product development. PwC's Skills for Australia intends to take measures to ensure consultation with industry does not result in stakeholder fatigue, including maintaining a confidential up to date stakeholder register.
Complexity of relationships of	• Managing stakeholder engagement, contrasting and dissenting views as well as balancing industry and training organisation consultation was raised as a

Sensitivity	Likely impact(s)
stakeholders	potential sensitivity. PwC's Skills for Australia will work to ensure all relevant stakeholders are consulted with and given opportunities to contribute via appropriate channels in the training product consultation process.
Removal of units or qualifications	• Certain stakeholders expressed views and discussion around the impact of changes to removed or amended units of competency and qualifications. PwC's Skills for Australia intends to ensure consultation with industry is broad to enable a wide range of views to be taken into account and a consensus reached during training product development phase.

PwC's Skills for Australia will ensure future consultations address these sensitivities to reach a consensus around the most appropriate response and subsequent training product development

D. Proposed Schedule of Work

Section D and E effectively serve as the cases for change for projects scheduled in 2018-2019. Section 4 outlines:
• The status of 2016-17 projects and the proposed schedule of work through to 2019-20.
• The 2018-19 project details including rationales behind projects, Ministers' priorities addressed, consultation plans and the scope of the projects.

The Proposed Schedule of Work presents activities anticipated to be conducted through to June 2022. This section is structured into three parts:

- **Status update for Year One (2016-17) and Year Two (2017-18) projects**
- **2018-19 Project Details**
- **Proposed Schedule of Work – 2017-18 to 2021-22**

Status for Year One (2016-17) and Year Two (2017-18) projects

The Printing and Graphic Arts IRC scheduled various projects for years one and two, as shown in Table 23 below.

Table 23: Status of 2016-17 and 2017-18 projects

Year	Project type	Project code	Project name	Status
2016-17	Case for change activity	2a	Establishing a competency framework for the industry to inform future reviews of the Training Package.	Completed.
2016-17	Case for change activity	2b	Investigate the broader industry needs for 3D printing. **This project includes the scope of Project 1a listed below.*	Case for Endorsement being drafted.
2017-18	Training product development	1a	3D printing units and skill set.	See 2b above.
2017-18	Training product development	1b	Industry knowledge and employability skills project.	Draft Case for Change pending IRC approval.

2018-19 Project Details in the Proposed Schedule of Work

Table 24: Link 2018-19 Project to workforce and training demand

Project	Occupation/skills impacted	Evidence of future workforce demand	Evidence of VET training demand	Project outcomes
See sections for more information:	Section C – *Implications of proposed response*	Section B - *Industry Employment Outlook*	Section C –*Key Drivers for change*	Section C –*Key Drivers for change*
Project 1c: Design, marketing and other pre-press technical UoCs	Anticipated to impact **6 occupations**. These include: • Printer's Assistant • Graphic Pre-Press Trades Worker • Print Finisher • Printing Machinist • Printer • Graphic and Web Designers and Illustrators	**Strong occupational growth** is expected for graphic and web designers, and illustrators with over **30,000 job openings** expected over the next 5 years[71]. While growth is stable or declining for other printing job roles there is still expected to be around **5,000 job openings** for these roles over the next 5 years[72].	Demand to **update units of competency** to reflect **advancements in processes and technology** that have occurred in the past 5 years. Current **gap in formal training** - employers and industry report "on the job" training is often required to upskill workers with qualification structures not currently addressing industry requirements.	Learners will have the opportunity to undertake units of competency that enable them to **work with current and emerging technology** in the printing industry. **Clearer communication of skills** to industry, with skills sets being created to allow for individuals to have a record of their specialisation.

Description

Design and marketing skills, along with technical pre-press competencies, represent the technical skills required from a worker prior to actual printing. This Industry Skills Forecast and Proposed Schedule of Work has highlighted in Section C that as the market adjusts, there is increased (and changing) emphasis on these skills, as printing organisations work to increase their offerings by including more design and marketing strategy prior to printing.

Rationale

Please see Section C Key Drivers for change and Proposed Responses – Design, marketing and pre-press on page 32 of this document.

[71] Joboutlook.gov.au (accessed August 2018) Graphic Web Designers, and Illustrators

[72] Joboutlook.gov.au (accessed August 2018) Graphic Pre-Press Trades Workers; Joboutlook.gov.au (accessed August 2018) Printing Assistants and Table Workers; Joboutlook.gov.au (accessed August 2018) Graphic Pre-Press Trades Workers

Minister's Priorities

Table 25: Minister's Priorities

Reform	Evidence of reform being addressed
Removing obsolete and superfluous qualifications from the training system	30 UoCs have been identified as possibly being outdated due to no enrolments in the past three years. They will be closely considered and may ultimately be removed from the Training Package.
Making more information available about industry's expectations of training delivery	Extensive industry consultation will be undertaken. A specific focus on ensuring that training is realistic and useful for learners and employers, as well as deliverable by RTOs will be maintained throughout the project particularly given the low availability and uptake of training currently.
Ensuring the training system better supports individuals to move easily from one related occupation to another	With the industry expectations being focused on breadth of skills and business focusing on expanded service offerings, the changes proposed capitalise on the links between graphic design, printing, and sales and marketing.
Improving the efficiency of the training system by creating units that can be owned and used by multiple industry sectors	While multiple new UoCs have not been proposed, the single new UoC is anticipated to hold relevance for learners enrolled in Culture and Related Industries and Business Services Training Packages.
Fostering greater recognition of skill sets	New skill sets will support recognition by employers of the specific skills of prospective employees. Just as importantly, the specialised skill sets provide a clear option for existing workers wishing to upskill or reskill.

Scope of project

PwC's Skills for Australia anticipates that if this Case for Change is approved, a Case for Endorsement will be submitted to the AISC in June 2019.

Training Package to be developed/revised:

ICP – Printing and Graphic Arts Training Package (Release 2.0).

Revise one qualification:

- ICP31415 Certificate III in Print Communications

Create seven skill sets:

- Marketing and Sales for Print
- Graphic Design for Print
- ePublishing
- Lithographic
- Flexographic
- Wide format digital print
- Sheet fed digital print

Revise twenty four units of competency:

- ICPPRP232 Electronically combine and assemble data
- ICPDMT296 Create and test an interactive CD-ROM/DVD
- ICPDMT293 Access and use the internet
- ICPPRP267 Produce offset lithographic plates
- ICPPRP268 Make photopolymer plates (flexographic)
- ICPPRP494 Develop document content and structure
- ICPPRP252 Output images
- ICPPRP396 Generate high-end PDF files
- ICPDMT321 Capture a digital image
- ICPDMT322 Edit a digital image
- ICPPRP211 Develop a basic design concept
- ICPPRP221 Select and apply type
- ICPPRP224 Produce pages using a page layout application
- ICPPRP225 Produce graphics using a graphics application
- ICPPRP260 Proof images
- ICPPRP311 Develop a detailed design concept
- ICPPRP321 Produce a typographic image
- ICPPRP322 Digitise images for reproduction
- ICPPRP324 Create pages using a page layout application
- ICPPRP325 Create graphics using a graphics application
- ICPPRP334 Prepare an imposition format for printing processes
- ICPPRP435 Generate complex imposition
- ICPSUP211 Prepare ink and additives
- ICPSUP311 Prepare ink and additives (advanced)

Revise thirty units of competency for potential rationalisation:

- ICPDMT491 Create an extensible document
- ICPDMT492 Create an extensible style sheet
- ICPINK211 Select and prepare materials for production
- ICPINK221 Blend chemicals
- ICPINK251 Filter and pack product
- ICPINK331 Manufacture inks and coatings
- ICPINK335 Manufacture varnish and resin
- ICPPRP223 Photograph a line image
- ICPPRP231 Manually combine spot colour and basic four-colour images
- ICPPRP266 Produce relief plates

- ICPPRP269 Produce photopolymer plates for pad printing
- ICPPRP272 Produce gravure cylinders manually
- ICPPRP281 Design basic carton
- ICPPRP283 Prepare artwork for screen printing
- ICPPRP284 Produce PDF files for online or screen display
- ICPPRP285 Scan a mono image
- ICPPRP286 Scan images for reproduction
- ICPPRP323 Photograph and produce halftone images
- ICPPRP331 Manually combine complex four-colour images
- ICPPRP352 Output complex images
- ICPPRP360 Undertake special colour proofing
- ICPPRP370 Produce multiple image plates
- ICPPRP372 Produce gravure cylinders electronically
- ICPPRP423 Apply colour to design brief
- ICPPRP452 Output complex images direct to plate or press
- ICPPRP481 Design complex carton
- ICPPRP484 Set up and operate automated workflow
- ICPPRP485 Develop a digital data template
- ICPSCP382 Produce computer image for screen printing
- ICPSUP212 Prepare coatings and adhesives

One Unit of Competency to be developed:

- Produce graphics using a graphics application (advanced) *("New")*

Consultation Plan

To ensure training product development is a reflection of broad industry-driven demand, PwC's Skills for Australia intends to seek industry input and guidance for this project via the following methods:

- Industry Project Working Groups (PWGs)
- Open forums (in person workshops) across a variety of locations
- Focus groups (in person and/or via teleconference)
- Targeted one-on-one consultations (in person and/or via teleconference)
- Online nationwide survey
- Desktop research

PwC's Skills for Australia intends to engage a wide range of stakeholders relevant to design, marketing and pre-press. Types of stakeholders to be consulted with include:

- Employers, essential to the VET sector given the role that they play in demanding the skills that lead to vocational outcomes.
- Industry associations/Peak bodies, who act on behalf of the printing and graphic arts industry to represent their needs and promote the interests of their member organisations.

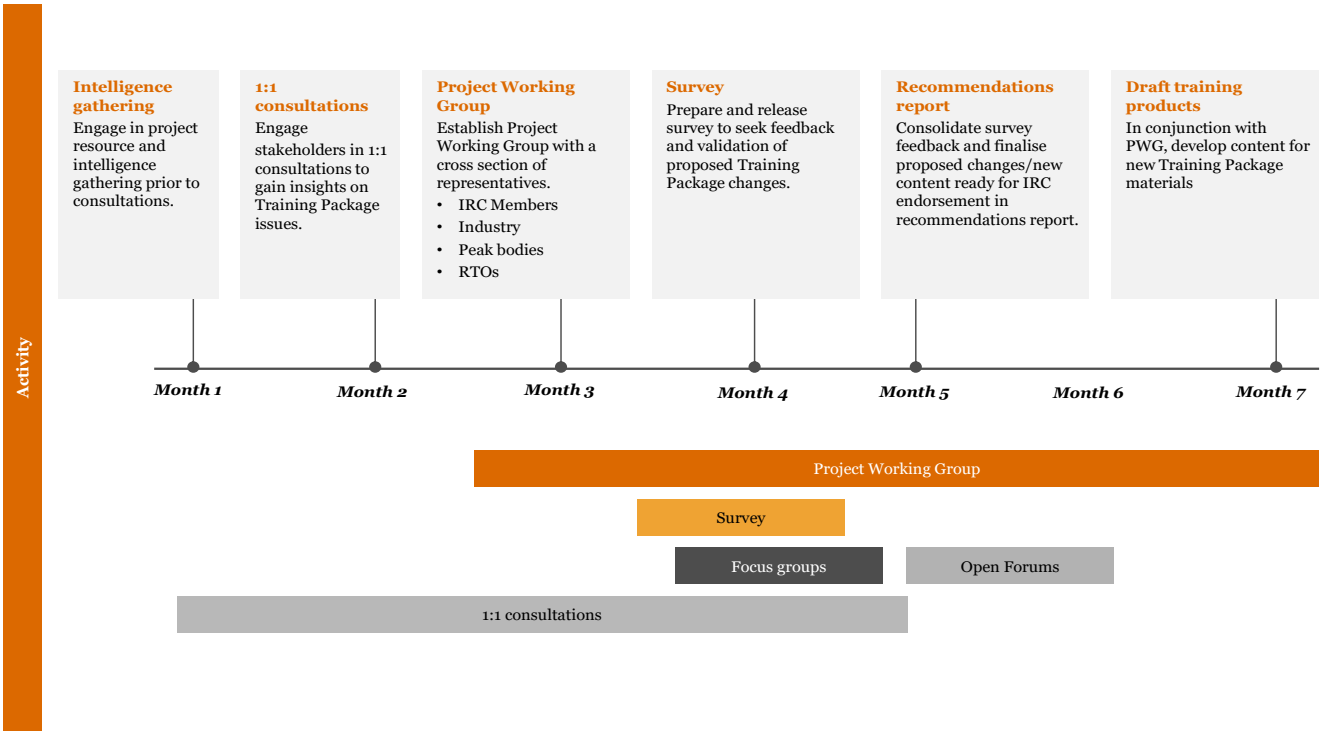
- Public/Government bodies, who are often responsible for legislative requirements and funding arrangements affecting the printing and graphic arts sector.
- Registered Training Organisations (RTOs), who deliver either existing ICP training products or national/state accredited courses relevant to the area of scope.

The stakeholders that will be proactively engaged include those listed below in Table 26. Many of these stakeholders have been consulted during the development of this document to ensure early inclusion and engagement. The list below is not exhaustive; it is intended that as further consultation progresses, additional stakeholders will be identified and their perspectives captured and considered.

Table 26: Stakeholders to engage for Project 1C

Employers	Industry associations/Peak bodies	RTOs and education providers	Public/Government bodies
• Impact International • The Print Managers • Print Logistics • UniPrint • The Print Press • JDA Print Recruit • Stockdale Personnel • Lane Print and Post Group • Scott Printing • Discus on Demand • Other independent printing companies within the industry	• Printing Industries Association of Australia (PIAA) • Australian Manufacturing Workers Union (AMWU) • Council of Small Business Organisations Australia (COSBOA) • Australian Graphic Design Association (AGDA) • Arts, Communications, Finance Industries, and Property Services (NSW) • FutureNow Creative and Leisure Industries Training Council • Australian Industry Group (AIG) • Business Council of Australia • Design Institute of Australia (DIA)	• Enterprise RTOs • Private and Community RTOs • Technical and Further Education institutions (TAFEs) • Universities undertaking progressive 3D printing work (including Monash University)	• State and Territory Authorities

Figure 5: Consultation Plan for Training Product Development



Proposed Schedule of Work – 2017-18 to 2021-22

Table 27 below presents the Printing and Graphic Arts IRC Proposed Schedule of Work for 2017-18 to 2021-2022. Specifically, it contains the activities endorsed by the IRC through to June 2021 in the previous work plan, and an action to review all UoCs in 2016-17 and 2017-2018 projects for currency in 2021-22. Previously endorsed projects have been reviewed to ensure alignment with AISC and COAG Industry and Skills Ministers' priorities, following advice from the Department. Specifically, the Department asks that the review of UoCs is aligned to the qualifications that form part of the VET Student Loans Program, review of qualifications with low or no enrolments, reduction of duplication across the system, creation of cross-industry UoCs and greater recognition of skill sets.

In a small Training Package such as ICP, a significant proportion of UoCs are shared across several qualifications. Due to this, and because projects have been defined on a UoC basis, qualifications have not been included in the table below. However, as there are only eight qualifications in the Training Package, all four training product review projects are expected to involve all qualifications to some extent.

Our mandate as an SSO is to review all UoCs in the ICP Training Package over four years. Additionally, the SSO may propose on behalf of the IRC to create new UoCs or incorporate existing non-native UoCs into qualifications and skill sets, where analysis of trends and stakeholder feedback suggests this training product development activity is necessary.

Table 27: Proposed Schedule of Work 2017-18 to 2021-22

Project code and name	Planned review start (year)	Training Package code	Training Package name	Qualification code	Qualification name
1a 3D printing units and skill set	2017-18	ICP	Printing and Graphic Arts	N/A	N/A
1b Industry knowledge and priority employability skills	2017-18	ICP	Printing and Graphic Arts	N/A	N/A
1c Design, marketing and other pre-press technical UoCs	2018-19	ICP	Printing and Graphic Arts	N/A	N/A
1d Print and post-press technical UoCs	2019-20	ICP	Printing and Graphic Arts	N/A	N/A
1e Review UoCs updated in 2016-17 ad 2017-18 for currency	2020-21	ICP	Printing and Graphic Arts	N/A	N/A
Review training products originally in scope of 2017/2018 for currency and relevance	2021-2022	ICP	Printing and Graphic Arts	N/A	N/A
Review the need for the creation of new training products to cater for new and emerging technologies and related skills	2021-2022	ICP	Printing and Graphic Arts	N/A	N/A

E. IRC signoff

This Industry Skills Forecast and Proposed Schedule of Work was agreed to by:

Andrew Macaulay
Chair
Printing and Graphic Arts IRC
01/05/2018

Appendix A Administrative information

About PwC's Skills for Australia

PwC's Skills for Australia supports the Printing and Graphic Arts Industry Reference Committee (IRC).

As a Skills Service Organisation (SSO), PwC's Skills for Australia is responsible for working with industry and our IRC to:

- Research what skills are needed in our industries and businesses, both now and in the future, to provide the right skills to match our job needs; helping us to stay at the forefront of global competitiveness and support continued economic prosperity.
- Identify and understand current and emerging trends in the global and domestic economy and how they impact on Australia's skills needs.

Revise our vocational qualifications and training content to better match what people will learn with the skills needs of our industries and businesses, giving our population the best possible chance of developing work ready skills.

About the Industry Reference Committee

The Printing and Graphic Arts IRC includes 10 members. The Printing and Graphic Arts IRC membership was refreshed in June 2017.

Table 28: Printing and Graphic Arts IRC Membership

Name	Organisation	Title	IRC role
Andrew Macaulay	Printing Industries Association of Australia (PIAA)	CEO	IRC Chair
Lorraine Cassin	Australian Manufacturing Workers Union (AMWU) Print Division	National Secretary – AMWU Print Division	IRC Deputy Chair
Robert Black	Holmesglen Institute	Program Manager – Printing	IRC Member
Ben Eaton	Starleaton	CEO	IRC Member
Kerim El Gabaili	OnePoint	CEO	IRC Member
Julie Hobbs	FutureNow Creative and Leisure Industries Training Council & Design Institute of Australia	CEO/National Immediate Past President	IRC Member
Peter Lane	Lane Print Group	Managing Director	IRC Member
Michelle Lees	HP PPS Australia Pty Ltd	Marketing Manager – Graphic Solutions Business	IRC Member
Brett Maishman	Fuji Xerox Australia Pty Ltd	National Industry	IRC Member

Name	Organisation	Title	IRC role
		Manager	
Michael de Souza	Australian 3D Manufacturing Association	CEO	IRC Member

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