



INTEGRATING  
NEWCOMERS

*Join Canada's construction workforce.*

British Columbia Construction Association

# Integrating Newcomers

A comparison of British Columbian and South African carpenters

OS Consulting Inc.  
24 March 2016

Funded by:



Immigration, Refugees  
and Citizenship Canada

Financé par :

Immigration, Réfugiés  
et Citoyenneté Canada

## List of Tables

Table 1. Rough comparison of the some of the conceptions of South African and BC programs.....	7
Table 2. Program comparison in weeks, hours (adjusted for statutory holidays, BC workweek at 40 hrs; South African work week at 40 hrs) - with an exchange mechanism for workplace hours – Note that Red Seal CofQ stands for the challenge credential access.....	12
Table 3. Essential skills defined at the Federal level.....	14
Table 4. Comparison of BC apprentice, BC challenge, and South African programs against Essential Skills for Carpenters .....	16
Table 5. Comparative program structure elements by name – highlighted cells indicate elements used in the analysis .....	22
Table 6. Rated comparisons at the GAC level - BC PO is the reference; colors and ratings as above, expounded in Appendix 1 .....	23
Table 7. Summary count of comparison ratings at the GAC level – BC PO is the reference .....	24
Table 8. Rated comparisons at the competency level - BC PO is the reference; colors and ratings as above, expounded in Appendix 1 .....	26
Table 9. Summary count of comparison ratings at the competency level – BC PO is the reference .....	30
Table 10. Rated gap competencies - BC PO is the reference; colors and ratings as above, expounded in Appendix 1 .....	31
Table 11. Gaps between BC PO and BC Challenger (NOA) .....	34
Table 12. Gaps between the BC PO and the NC(V).....	35
Table 13. Comparison of BC and South Africa examination and credentialing .....	41
Table 14. Color-coded safety and training scales .....	43
Table 15. Combined scales.....	44
Table 16. Example of profile results using the all of the ratings to determine a risk factor on a 3-point scale (weighted risk factors were not considered).....	48
Table 17. Example of weighted program comparison .....	48
Table 18. Glossary of terms .....	49

## List of figures

Figure 1. Comparison of program duration, in-school, and on-the-job length in weeks .....	13
Figure 2. Essential skills compared as a match percentage by skill; BC Apprenticeship, BC Challenge, and South African NC(V) .....	19
Figure 3. Normed ratings distribution for BC's apprentice program (BCPO), the BC Challenger program (NOA), and the South African – at the GAC / Task / Sub-module level .....	25
Figure 4. Normed ratings distribution for BC's apprentice program (BCPO), the BC Challenger program (NOA), and the South African NC(V) – at the competency / sub-task / Compétences détaillées level.....	31

## Summary

*A category pulls together many phenomena in a manner that benefits the creature in whose mind it resides. It allows invisible aspects of objects, actions, and situations to be “seen”. Categorization gives one the feeling of understanding a situation one is in by providing a clear perspective on it, allowing hidden items and qualities to be detected ... future events anticipated ... and the consequences of actions to be foreseen. Categorization thus helps one draw conclusions and to guess about how a situation is likely to evolve.*

Hofstadter and Sander<sup>1</sup>

## Introduction

The British Columbia Construction Association (BCCA), through its *Integrating Newcomers* initiative, is interested in establishing equivalencies and identifying gaps between South African credentials and Canadian (specifically BC) credentials.

This paper compares the training and certification of British Columbia (BC) and South African carpenters. Where possible 6 kinds of programs were taken into account, namely:

- British Columbia apprenticeship program
- British Columbia “Challenger” program
- South African NC (V), TVET<sup>2</sup> (college-based)
- South African Section 26 (D)<sup>3</sup> (time-bound apprenticeship)
- South African Learnership/NC (employment-based, not time-bound, work-school program)
- South African Section 28 (Recognition of Prior Learning: RPL)

These programs lead to a single credential in each country. The BC programs lead to the Red Seal endorsement. The South African programs lead to a Level 4 Trade Certificate, which, interestingly is also called “red seal”. Note, however, that RPL achievers sometimes receive a credential with a different name, for example “certificate” instead of “diploma”.

## Methodology

We conducted the comparisons using documents from three sets sources: BC’s Industry Training Authority and Ottawa’s Red Seal websites for Canadian content - Program Overview and Challenge process and requirements, and the NOA, Essential Skills, and Ellis Chart, respectively. And for South African materials, we consulted the TVETs, QCTO, HET, SAQA, CETA, and NAMB<sup>4</sup> websites – these cover (roughly) technical colleges, quality assurance, higher education, qualifications levels, construction education and training sector, and testing, respectively.

---

<sup>1</sup> Douglas Hofstadter and Emmanuel Sander (2013); *Surfaces and Essences*, Basic Books, p.14,

<sup>2</sup> TVET stands for colleges that offer Technical and Vocational Education and Training (TVET replaces the term FET (colleges): Further Education and Training)

<sup>3</sup> Refers to Section 26 (D) of the Skills Development ACT (SDA)

<sup>4</sup> QCTO stands for “Quality Council for Trades and Occupations”; HET (a ministry) stands for “Higher Education and Training”; SAQA stands for “South African Qualification Authority”; CETA (a sector council) stands for “Construction Education and Training Authority; and NAMB stands for “National Artisan Moderation Body”

The comparison is in four parts: First Impressions, Essential Skills, Comparing Program Levels, and Examinations and Certification. In First Impressions we used the documents to conduct a meta-analysis: we wanted to know about similarities and differences in philosophies, program delivery, length, organization, emphasis and high level content. In Essential Skills, we rated each program against each essential skill to represent the likelihood that a graduated carpenter had mastered the skill. In Program Levels we rated each program against the BC/ITA's Program Overview elements, rating first the general areas of competence then the competencies. And in Examinations and Certification we compared the formal requirements for certification, examinations, and the certification granted. We discuss briefly the structure of examinations, problems associated with the examinations, and the validity and reliability of these examinations.

We created two tools to help us with these tasks. We developed a 10-point rating system color-coded to indicate rough safety and training implications, and cross-referenced to the South African ratings. And we developed a glossary of terms to reflect how we understood training, testing, and certification terms in English and South African.

### **Findings**

There are 2 interesting aspects to the “generic” findings we gloss on below: the South African training and certification system, and the knowledge, skills, and abilities of holders of the South African carpentry credential.

#### ***The training and certification system***

The trades training and certification system in South Africa has been in flux since 1998 when a new Act came into force. As it is now, it is a complicated, yet-to-be-finalized system with many interlocking agencies sharing in the creation, specification, implementation, delivery, and testing activities for any tradesworkers/artisans training program. It is however, a national system so intra-jurisdictional issues, like those commonly encountered in Canada, do not apply.

##### ***The system before 1998***

Before 1998, apprentices were formally indentured (under Section 13) to a single employer for the duration of the apprenticeship. Apprentices employed by companies under Section 13, would complete N-courses to cover the trade theory component at public or private Technical and Vocational Education and Training (FET/TVET) Colleges, and do their practical training at Sector Education and Training Authority (SETA) / Quality Council for Trades and Occupations (QCTO)-accredited skills development providers.

Certification was awarded by SETAs (and the Department of Labor then HET) after completing all of the requirements and within the period of indenture. Since October 2013, the QCTO issues all Trade certificates.

Unlike apprentices, workers using the RPL route (a.k.a. Section 28 candidates) did not have to collect all of their work experience in a prescribed period of time but would have to pass the same final trade tests as the apprentices.

## *Integrating Newcomers*

---

### *The system after 1998 (mainly in the past decade)*

In 2009, HET was established and SETAs – who have “delivered” learnerships since 2000 - and FETs/TVETs became part of the legislative competence of HET as a starting point in changing tradesworker/artisan development in South Africa. The NQF Act replaced the SAQA Act of 1995 and three Quality Councils<sup>5</sup> were established to replace the previous Education and Training Quality Assurance (ETQA) function. QCTO is now responsible for quality assurance and the certification process for new trade and occupational qualifications.

QCTO appoints industry partners to coordinate the development of the requirements and related documentation and specifications for the training of tradesworkers/artisans. And NAMB has the statutory to develop Trade Tests for all the trade qualifications once registered by SAQA.

Once a candidate complies with the above-mentioned, he/she will be allowed access to an external integrated summative assessment (the trade test) conducted at any QCTO accredited Trade Test provider.

### *Impacts of the changes*

Since the acceptance of a competency-based model for education and training in 1985, South Africa has been steadily moving towards a full NVQ system like that of the United Kingdom for the training tradesworkers/artisans. This move was – and still is - to counter the traditional time-based apprenticeship approach and places greater reliance on modular “applied competence”, that is the ability to perform in the appropriate context, rather than having been in the trade for a defined length of time and attending a fixed number of hours of in-school training.

Starting in 1994, this philosophy has led to the creation and refinement of a 10-point National Qualification Framework (NQF), and pegging tradesworkers/artisans training and certification to this framework by registering the qualifications’ requirements and testing parameters.

This approach makes comparisons with competency-based systems that are more time-focused, like in British Columbia, difficult – there is scant mention of time in the documentation beyond “months”. And it also makes comparisons difficult as the match between South African registered qualifications within a program might not all be at the same NQF level, or match one-to-one competencies listed in British Columbian documents.

### **Knowledge, Skills, and Abilities (KSA)**

The South African carpenter is an able general carpenter. But a just- graduated carpenter, regardless of route, will be short of time in the trade when compared to a British Columbia carpenter. The exception might be a South African RPL graduated carpenter, who might have had to collect many hours on the job in order to qualify for the final examinations.

But the South African carpenter has attended “school” for much longer periods of time: 3 years for the NC(V) graduate, 12+ months for the apprentice, and 18 months for the learnership graduate. This compares to 7 months for BC graduate of the apprenticeship system and no school at all for the

---

<sup>5</sup> The other 2 QCs are UMALUSI (Council for Quality Assurance of General and Further Education and Training), and CHE (Council on Higher Education)

## *Integrating Newcomers*

---

Challenger (the same is true, usually, for a South African RPL graduate). That is because in South Africa, the NC(V) and apprentice carpenters are expected to take general math, science, and English in addition to trade-specific courses and shop and field work. By contrast, BC apprentices enter the block release training system usually after they exit the K-12 system, and the Challengers do not take any formal training that we know of.

The South African carpentry program strongly emphasizes hand skills. For example, the NC(V) program is split 60:40 shop:theory. With some topics covered in major part in the shop, e.g. stairs, shafts.

The South African program elements are extremely detailed and very prescriptive as they are aligned to registered sub-qualifications, each of which is tested independently and by outside/accredited assessors.

In BC, there is a tacit “exchange rate” between hours on the job and hours at school; in BC the schooling for apprentices is short and the hours are costly. Whereas in BC one can exchange work hours for school hours – it is the basis of the challenge process, in South Africa, essential schooling must be taken regardless of work hours and route taken. And BC apprentices’ and Challengers’ most onerous program component is hours on tools, roughly the opposite of the South African approach.

In both BC and South Africa, certification is granted on the strength of one or several examinations. In BC, it is a single summative paper and pencil exam, accessed once the training institutions’ formative tests (soon to be standardized paper-and-pencil tests) have been passed. In South Africa a comprehensive battery of formative written and practical tests throughout the training program, and a summative set of tests at the conclusion of the training.

### **Gaps**

The gaps we flag below are those for a South African carpenter coming to BC. Throughout the analysis, we make the trivial point that, for some of the gaps like health and safety, a BC carpenter moving to South Africa would show the same gap. Notwithstanding this fact, the gap analysis would have yielded substantially different results if we had conducted using either the NOA or the South African programs as a reference rather than the BC apprenticeship program overview. But these differences could be attributed, in part, to structural differences in the documentary sources used.

### **Language**

Despite the English requirement in the South African program, a South African carpenter, while possibly competent in basic English, might lack the technical language skills or “jargon” of the trade in BC. This language gap might be more or less pronounced depending on the dominant working language at work – school programs appear to be delivered in English.

### **Health and safety**

Health and Safety legislation, regulations, and their implementation seem similar in South Africa and in British Columbia, although OSH is a Ministry of Labour activity there as opposed to an independent regulator here. While there are similarities at the personal level (e.g., Personal Protective Equipment (PPE), Fall Arrest, etc.), at the worksite level (e.g., dust, asbestos, noise, etc.), and at the application of the regulations, a South African carpenter would miss the differences between the South African approach and the BC approach, probably on account of those similarities.

## *Integrating Newcomers*

---

### [Codes](#)

Like Health and Safety, building codes are jurisdiction-specific. A South African carpenter coming to BC would be fully aware that there are building codes, would know how to look things up, would know how to apply code requirements to his or her work, but would not know the specifics of the codes that pertain in BC.

### [Measurement system](#)

South Africa is a MKS or metric country. South African carpenters do not know the FPS or imperial system (save for the “S” of second). BC carpenters usually work in imperial, even the Red Seal exam provides all dimensions in both metric and imperial systems. And BC carpenters use lifting and hoisting equipment that is tested and tagged in imperial (if it is from the United States), use imperial load charts, and calculate their load limits using pounds.

### [Concrete / formwork](#)

South African carpenters have in-school (theory and shop) formwork training. But the familiarity with this type of work will depend on the at-work module taken as part of the program. They may opt for “Roofing and Partitioning” or “Finish and fixtures” rather than “Formwork”.

### [Non-wood](#)

South African carpenters handle both “timber” (which seems to be what they call dimensional lumber) and steel. Here again the degree with which the South African is familiar will depend on the at-work module taken.

### [Welding](#)

South African carpenters do work with reinforcing steel when they do concrete work, but they do not take any oxy-fuel training.

## First impressions

In this section, we conduct gross comparisons between the South African and BC programs. We compare the programs' stated conceptions or philosophies, trade descriptions, credential worth, and program lengths and mixes. Throughout, we consider "just graduated" carpenters as our subjects. We realize that all graduated carpenters have had different learning trajectories most likely leading to different abilities, but, given the lack of profiling data – and the scope of this analysis – we have used published program content and standards as normative tools: all graduates of a program are the same.

Using the saw "a carpenter is a carpenter is a carpenter" or even "if it looks like a carpenter, talks like a carpenter, acts like a carpenter, then it must be a carpenter" to circumscribe what the trade is – for our purpose to be able to compare South African and British Columbian carpenters – would be naïve at best, dissembling at worst.

But it allowed us to be in a position to conduct an analysis of the similarities and differences between the two programs / certifications. And we will be able to use this analysis to develop a set of recommendations to make the equivalencies (and differences) pertinent to carpenters when they switch jurisdictions.

### Program conceptions

Here we compare how the Canadian and South African education and training and governmental institutions apprehend their trade learners and, ultimately, grant them a credential. Beyond the face value of, say, a South African Trade Certificate/"red seal" or a CofQ, the credentials carry a social worth that is a direct legatee of the philosophy and pathway that led to the credential. Expressions such as "book learning" or "academic", especially when used as a qualifier adduced to a credential, have currency in the world of trades, where it is not valued as highly as "on-the-job" – and this credential social depreciation is levelled from both in-school and on-the-job perspectives.

The fact that there is a social value attached to credentials is based on the assumption that different paths taken to a credential, job, or career yield a different, in our case, carpenter. And to the extent that this difference goes beyond presence or absence of skills, it makes for a different tradesperson notwithstanding personality traits.

A stated goal of education in South Africa, and artisan training programs are no exception, is directed at employment (or at the very least at reducing unemployment). Fixed term South African apprenticeship contracts obligate the employer to hold on to the indentured apprentice for the duration of the training, a thing that has become harder as economic conditions in South Africa have deteriorated. The NC(V), and especially the Learnerships are a response to these economic drivers. The South African programs, in general, are a mean to get younger leaners (between 16 and 25; learnerships, animated by the SETAs will consider learners of up to 35 years) a better chance to get a job. By contrast, in BC, apprenticeships are not single-employer obligate and the system is more geared at providing theoretical underpinnings in a trade to current workers than trying to find training berths for the unemployed (this is by no means an absolute).

The South African programs are all education and training-dominant, and industry training requirements are to anchor this training, as well as ensure employability. By contrast, the BC system (and we assume, by association, other Canadian jurisdictions) is based on workplace skills obtained through the job, and

## *Integrating Newcomers*

---

training, when taken, is meant to elucidate these practical, workplace skills. We could see the two systems as a Janus analog: the training programs are what separates the two faces, they are the gate or door to the world of work as a tradesworker/artisan; looking forward to employment in South Africa and looking back to work done in BC.

The South African system deals with plain, full time students or students who chipping away at the requirements, all hoping to qualify for full-time, steady, well-paid jobs. By contrast, the BC system deals with workers who happen to be released from work for in-school training at variable intervals.

**Table 1.** Rough comparison of the some of the conceptions of South African and BC programs

Component	South African program	BC Program
Program aim	Employment	Skilled worker
Training approach	Theory and shop	Practice
Training emphasis	Employability skills	Hand skills
Training regimen	Lock-step, qualifications-based	Open
Training delivery	Alternating (apprenticeship)	Block release (apprenticeship)
	Modular alternating (learnership)	
	Full time school + OJT	
Training duration	2.5, 3, 4.5 years	4 – 5 years <sup>6</sup>
Main training vector	Classroom + shops (NC(V))	Work / jobs
Learner status	Employee under contract (apprenticeship)	Employee (apprenticeship)
	SETA sponsored	
	TVET student	
Credential	National	Provincial + national endorsement
Pass / Completion rates	39.3% (2012) <sup>7</sup>	45%

### [What is a carpenter?](#)

Taking for granted that not all carpenters are absolutely equal when they graduate, we can nevertheless “pretend” that they are and that they are thus solely due to the different training pathway they’ve taken. This approach will allow us to conduct rough and more detailed analyses of the similarities and differences between the two programs and certifications.

To illustrate this point, here are (excerpt of) definitions of “carpenter” which we found in the three (+) major sources of information we’ve used in this report:

- Industry Training Authority (ITA) - British Columbia

---

<sup>6</sup> <http://www.statcan.gc.ca/pub/81-004-x/2010002/article/11253-eng.htm> accessed 3 December 2015

<sup>7</sup> <http://www.dhet.gov.za/DHET%20Statistics%20Publication/Statistics%20on%20Post-School%20Education%20and%20Training%20in%20South%20Africa%202012.pdf> accessed 23 March 2016

## *Integrating Newcomers*

---

- “Carpenter” means a person who performs all work in connection with the assembly and erection of false work and forms for concrete, wood and metal frame construction, and installs interior and exterior finishing metals for residential, commercial, and industrial projects, while conforming to plans and specifications and local building codes. Other trade skills include: layout, rigging/signaling, cutting/welding and the erection and dismantling of scaffolding. (Industry Training Authority, “ITA”, Carpenter Program Outline, 2013<sup>8</sup>)
- National Occupational Analysis (NOA) - (Canadian / federal)
  - Carpenters construct, renovate and repair residential, civil, institutional, commercial and industrial (ICI) structures made of wood, steel, concrete and other materials. While the scope of the carpenter trade includes many aspects of building construction, a growing number of carpenters work for contractors who specialize in such areas of trade practice as concrete forming, framing, finishing, interior systems and renovation. Carpenters are employed in a variety of job environments, including houses under construction or renovation, ICI and infrastructure projects, and plants that pre-fabricate buildings. ... (Employment and Social Development Canada, National Occupational Analysis - Carpenter, “NOA”, 2013)
- SAQA (2014)
  - Carpenters construct, erect, strip, install, renovate and repair structures and fixtures of wood, plywood, panelling, timber and steel formwork and access materials ... will be able to: determine materials, dimensions required and setting out and preparing a work area on a construction site; construct, erect, install and maintain structures on work area and building sites; fit, assemble and alter internal and external fixtures of buildings such as walls, doors, window frames, fascia boards and panelling.
- Bargaining Council for the Building Industry (Cape of Good Hope) - South Africa
  - woodworking, which includes carpentry and veneer panelling and the polishing and sandpapering of same, woodworking, the manufacture of fixtures to specification for installation in specified buildings and the manufacture of stocks, machining, turning, carving, fixing corrugated iron or asbestos tile, shingling and other roof coverings, sound and acoustic material, cork and asbestos insulation, wood-lathing, composition ceiling and wall covering, plugging walls, covering woodwork with metal and covering metal with woodwork, block and other flooring, including wood, linoleum, rubber composition, asphalt-based floor covering or cork, and the sandpapering of same, operating a Mall and Biax or similar type of portable spinner and flexible cutting, finishing and polishing machine, shuttering and/or preparing forms of moulds for concrete, cork carpeting and any class or kind of linoleum when fixed in any building or structure, and the application of asphaltic saturated felt or fabrics to floors and/or walls and/or roofs, whether or not the fixing in the building or structure is done by the person making or preparing the article used. For the purposes of this definition "structure" means structure in the nature of, or incidental to, a building

---

<sup>8</sup> Interestingly, this 2013 document states that it has been aligned to the 2014 National Occupational Analysis, “NOA”, the federal document that is the basis for the Red Seal examination, but we could not locate this 2014 NOA.

### **Rough comparisons – Trade description**

Using the trade descriptions, we've tried to identify large qualitative differences between the Canadian, BC, and South African trade practices. The large differences can point to gaps that might be filled by upgrade training programs when carpenters move from one jurisdiction to another.

Not all carpenters are the same as we noted above. Regardless of jurisdiction, training and certification attest that a certain level has been reached at some time. But each carpenter's extant skill set will be a function of (i) his/her job experience(s) after the training, and (ii) the length of time since certification. We are calling this effect "skills erosion": a state of affairs due to the differential worker exposure to specific work practices over time.

It remains that there are clearly identifiable areas in the Canadian programs such as forming, the use of lifts / scaffolding, and rigging that are not explicitly part of the South African program – but they are mentioned under the heading "resources" in some of the competencies.

### **Similarity – Work sites**

All descriptions make it clear that carpenters work on all types of edifices. But while BC clearly delineates Residential, Commercial, and Industrial, South African definitions do not. Further, the BC program shows that the work may be new, remedial, restorative, or ameliorative, but the South African definitions are mute on this.

### **Similarity – Work drivers**

Both Canadian and South African programs include the use of blueprints, schematics, and drawings to conduct their work. The Canadian definitions usually include this fact, the South African do not.

### **Similarity – Work Scope**

All descriptions indicate that carpenters are expected to be able to carry out all aspects of a construction project.

### **Difference – Worker safety**

Canadian documents emphasize site and personal safety, albeit not in the trade description itself. The Federal document refers the reader to the federal Workplace Hazardous Materials Information System (WHMIS) and to provincial Occupational Health & Safety (OH&S) regulations, while the BC document refers the reader to the WorkSafeBC website.

In contrast, the South African descriptions do not mention safety as such. The training programs have a theoretical component devoted to OSH requirements and practices.

An in-depth examination of the differences between the Canadian and South African approaches to safety at work from a training or certification perspective is beyond the scope of this analysis. However, given the similarities – albeit tailored to the South African work environment and practices - between the approaches, it is fair to say that South African workers starting to practice in a Canadian environment would not require top-to-bottom training in safety regulations and processes and on-the-job practices. Canadian workers moving into a South African environment would also require training mainly in the differences in at-work safety practices, and in the structural and legal aspects of worker safety.

## *Integrating Newcomers*

---

### Difference - Building materials

Both Canadian definitions clearly de-emphasize “wood”: the word appears once in the BC and Federal definitions alongside the word “metal”. And metal is given additional weight in the BC description with additional mention for cladding, cutting and welding. One of the South African definitions practically restricts the scope of carpentry to wood (and wood by-products) and both South African definitions provide only scant information on the topics of metal(s) or other synthetic composites. And it is important to remember that a South African carpenter will have specialized in, say, formwork, or roofing, or finishing, therefore may be unfamiliar with materials used in these “specialties” even in his/her home country.

### Difference – Skills overlap with other trades

Only the NOA under the heading of “Occupational Observations” mentions trends for the carpentry trade across Canada. Under that heading, for example, we learn that more and more businesses - and individual carpenters - specialize in an aspect of the trade, that carpenters increasingly use compressed gas or cordless tools and siting technology such as total stations and lasers, etc.:

*While the scope of the carpenter trade includes many aspects of building construction, a growing number of carpenters work for contractors who specialize in such areas of trade practice as concrete forming, framing, finishing, interior systems and renovation.*

*Carpenters are employed in a variety of job environments, including houses under construction or renovation, ICI and infrastructure projects, and plants that pre-fabricate buildings. They must be prepared to work in a variety of working environments.*

(Employment and Social Development Canada, National Occupational Analysis - Carpenter, “NOA”, 2013)

While in South Africa, one of QCTO’s document states:

*Learners entering this qualification will likely feed into the industry with a National Occupational Qualification: Builder's Worker qualification. The likely vertical progression for a qualified learner with this qualification is a National Occupational Qualification: Construction Foreman. This National Occupational Qualification articulates horizontally with other construction trades and occupations with cross-cutting credits in the Knowledge Specifications. This includes, National Occupational Qualifications: Carpenter [sic]; Glazer; Building Insulation Installer. This qualification is a trade qualification within the Construction environment (QCTO – Curriculum Development 2014)*

### Rough Comparison – The credential’s worth

The worth of a “ticket” is dual: that of having one in the first place, and that of the mean by which it was attained – what we could call an “acquisition value”. Usually just having a ticket suffices. However, if any argument arises as to the worth of the ticket, disagreements hinge on the acquisition value, usually to decrease the ticket’s social value. The same holds for the experiential path taken to get the ticket; the reputational value of the employer or the projects worked on weigh heavily on the overall worth attached to the ticket.

As the “Program Conception” section above indicates, credentials appear to be more important economically (and perhaps societally) in South Africa than in BC where what a worker can do, based on his/her experience, usually trumps a “ticket”. But the BC experience might not be the same as that in

## *Integrating Newcomers*

---

Canadian jurisdictions that have “compulsory trades” like Alberta; there, having a ticket – or being a registered apprentice - is necessary to practice.

Both in BC and in South Africa the credential is held for life. South African credentials, however, are better articulated than in BC and Canada when qualifications overlap trades – even if this is not eminently evident from our study. This is true for all South African pathways, with the exception perhaps of the RPL which sometimes yields an “equivalent” credential, i.e. is called something different.

Finally, South African credentials are issued by the national government and have currency everywhere in South Africa. By contrast, a BC carpenter may face different fees and processes depending on the Canadian jurisdiction he/she wants to have the BC credential recognized.

### **Rough Comparisons – Program mix and length**

In British Columbia<sup>9</sup>, there are 2 main paths to get certified as a carpenter: a formal course of study (apprenticeship), and an informal, workplace-based route (challenge) – for simplicity’s sake, we have ignored the branching and bridging available to learners along the way. The main differences between the two pathways are (i) the open-endedness of the workplace-based route, and (ii) the exchange of schooling for additional experiential hours. The exchange rate<sup>10</sup>, as it were, is 3.55 hours of work for each hour of school (see Table 2 and Figure 1 below).

In South Africa credentials are granted upon completion of a state-sanctioned program and state- and industry-sanctioned theoretical and practical examinations. There is no exchange rate since learners are expected to reach the same educational and practical goals, regardless of route, and since the examinations are similar.

Briefly, it seems like in British Columbia, school-based training is disesteemed - can be replaced wholly by workplace experience - but worth a lot, whereas in South Africa school-based training is a must, that can be replaced by workplace training only for RPL applicants – and workplace experience is highly structured and monitored: the workplace has to be approved by the relevant SETA and a completed and signed workplace log book is required to access qualifications examinations.

Comparing the programs and using the British Columbia exchange rate – comparing a South African credential<sup>11</sup> for BC, and norming to the minimum BC requirement for hours in the trade, The NC(V) shows a slight advantage (+0.26 years), whereas both of the other programs fall short. The best match, at this gross analytical level, is with the NC(V) credential acquired through a TVET route a +0.26-year<sup>12</sup>

---

<sup>9</sup> We specify British Columbia because the requirements differ from jurisdiction to jurisdiction for apprenticeship from 3 years and 6000 hours to 4 years and 8000 hours (see Ellis Chart at <http://www.ellischart.ca/home.jsp?lang=en>); and for the challenge with undefined years and 9720 work hours in BC vs. 6 years and 10,800 hours in Manitoba.

<sup>10</sup> The exchange rate, normed to the BC requirements, is a rough temporal measure we used to equate on-job experience and in-school training. The exchange rate is calculated as  $(H_A - H_C)/H_{IS}$ , where  $H_A$  are on-job apprenticeship hours,  $H_C$  are minimum required hours for a challenge (i.e. without attending school), and  $H_{IS}$  are total in-school hours during the apprenticeship. The South African exchange rate is calculated norming on the Bac pro (lycée-based).

<sup>11</sup> From here on we do not include the RPL-based credential as it there are no “standards” that allow for an easy comparison: each RPL credential is in a way unique, even if the holder has passed the examinations

<sup>12</sup> “Year” is defined loosely as 50 weeks (accounting for 2 weeks of annual vacation) each at 41.8 hours for a total hours of 2080 hours (the figure used for calculations in this part of the analysis) – hours at work are undefined /

## *Integrating Newcomers*

---

BC workplace coverage equivalent. The Section 26(D) and learnership programs fall short (-0.81 and -2.08 years respectively) perhaps a reflection of the program duration more than anything else. We have to point out again that the timeframe of these programs is much looser than it is in BC since all of the qualifications are competence-based, and the ability of a learner to complete faster or slower than another learner could result in substantially different completion times, making the calculations we performed inaccurate.

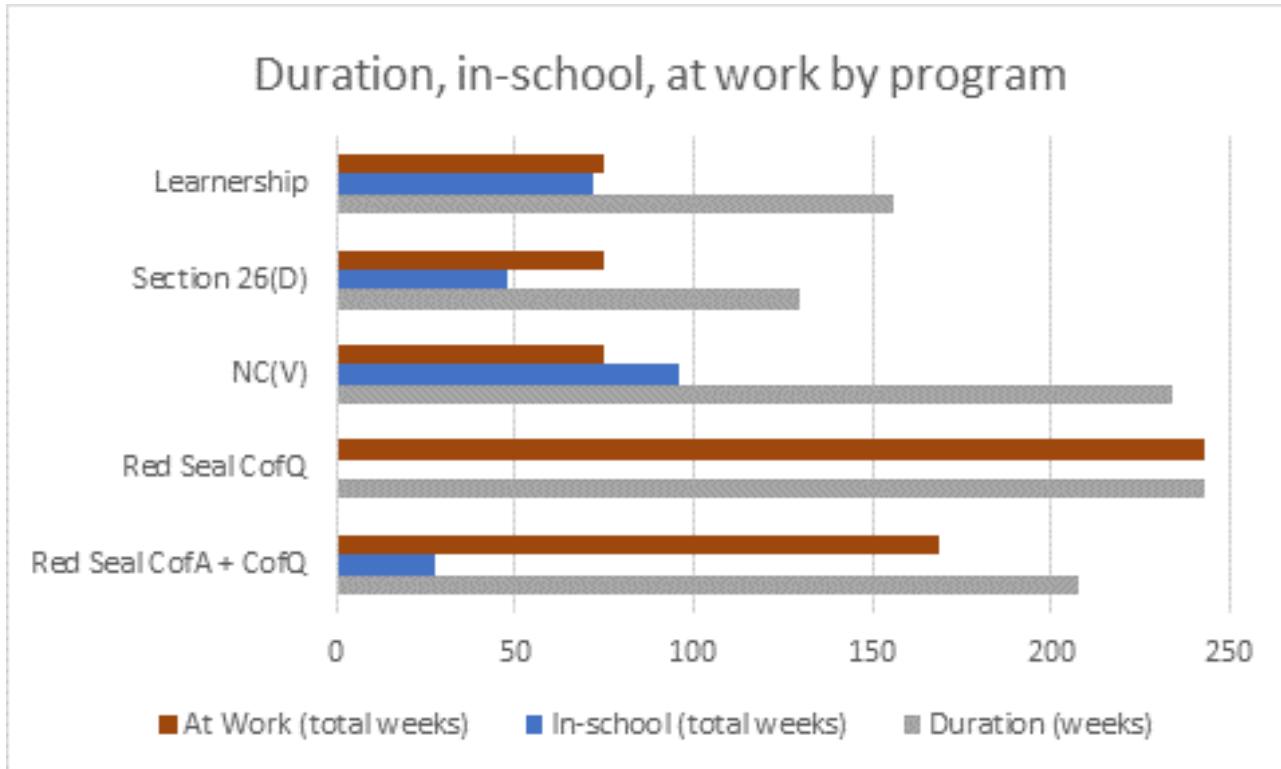
Given the school-centric nature of South African programs, it seems that a structured workplace-based "make-up" program for incoming South African workers is the best approach.

**Table 2.** Program comparison in weeks, hours (adjusted for statutory holidays, BC workweek at 40 hrs; South African work week at 40 hrs) - with an exchange mechanism for workplace hours – Note that Red Seal CofQ stands for the challenge credential access.

	Jurisdiction				
	British Columbia		South Africa		
	Red Seal CofA + CofQ	Red Seal CofQ	NC(V)	Section 26(D)	Learnership
Program Elements					
Duration (years)	4	5	4.5	2.5	3
Duration (weeks)	208	243	234	130	156
In-school (weeks/year)	7	0	21	19	24
In-school (total weeks)	28	0	96	48	72
In-school (total hours)	840	0	2880	1440	2160
At Work (hours/year)	1685	2080	667	1200	1000
At Work (total weeks)	169	243	75	75	75
At Work (total hours)	6740	9720	3000	3000	3000
Extra work hours		2980		0	
"Exchange rate"		3.55		0.00	
Extra school hours SA-CofA			2040		
Extra school hours NC(V) - Section 26(D)			1440		
Extra school hours NC(V) - Learnership			720		
BC Exchange rate value NC(V)			7237		
BC Exchange rate value Section 26(D)			5109		
BC Exchange rate value Learnership			2554		
NetBC workplace "value"	9720	9720	10237	8109	5554
Difference	0	0	517	-1611	-4166

---

unregulated, in the sense of minima or maxima, save for obligations under the BC Labor Code and/or Collective Agreements for unionized workplaces. In-school for BC apprentices is nominally set at 30 hours/week but contact time may vary from institution to institution depending on Collective Agreement



**Figure 1.** Comparison of program duration, in-school, and on-the-job length in weeks

### **Essential skills**

#### **What are “Essential Skills”?**<sup>13</sup>

“Essential skills are the skills needed for work, learning and life. They are used in nearly every job and at different levels of complexity.

There are nine essential skills” (see Table 3):

**Table 3.** Essential skills defined at the Federal level

<b>Skill</b>	<b>Description / Competency</b>
<b>Reading</b>	Read project specifications to understand what is required for a project.
	Read specification books and notes on blueprints.
	Read and understand first aid and safety reports.
	Read and understand safety inspection manuals.
	Read and interpret building codes, regulations and standards to comply with regulations.
	Read installation manuals.
	Read industry trade magazines to learn about technological advancements, such as new construction materials and methods.
<b>Document use</b>	Interpret labels such as the Workplace Hazardous Materials Information System (WHMIS) to follow safety guidelines.
	Interpret signs for information about directions, cautions and safety procedures.
	Complete time cards to record work hours.
	Interpret shop drawings and specifications for the sizes, locations and types of materials required for a job.
	Prepare lists of materials.
	Make sketches of drawings or plans to use on job sites.
	Refer to load charts to determine load bearing capacities when operating material handling equipment.
	Interpret blueprints to verify measurements, determine the integrity of plans and to report mistakes.
<b>Numeracy</b>	Estimate how long it will take to complete a job.
	Calculate the quantity of materials needed for a job, such as the volume of concrete required for footings.
	Convert between metric and imperial measurement systems.
	Verify bills when purchasing tools, accounting for discounts and taxes.
	Analyze survey data for excavations to draw conclusions about safety.
	Take precise measurements using survey instruments.
	Make scale drawings.
	Calculate stringers, treads and risers to build stairs.
	Calculate a rafter line length using the measurements of rise and run.

---

<sup>13</sup> [http://www.red-seal.ca/resources/\\_2ss\\_2nt\\_3.11-eng.html](http://www.red-seal.ca/resources/_2ss_2nt_3.11-eng.html) and  
[http://www.esdc.gc.ca/en/essential\\_skills/tools/carpenter\\_fs.page](http://www.esdc.gc.ca/en/essential_skills/tools/carpenter_fs.page) accessed 3 December 2015

## *Integrating Newcomers*

---

<b>Skill</b>	<b>Description / Competency</b>
<b>Writing</b>	Record information on work activities such as problems encountered and resolved and hours of work.
	Write purchase orders for materials.
	Write safety and accident reports.
	Write change orders to recommend blueprint modifications.
	Write reports for project meetings.
<b>Oral communication</b>	Talk to suppliers to order materials or compare prices.
	Interact with other carpenters to discuss work schedules, safety concerns and to share ideas.
	Communicate with a foreperson to report on work progress and troubleshoot problems.
	Talk to manufacturer representatives to discuss problems with equipment and materials.
	Interact with owner(s) to discuss new ideas and potential changes.
<b>Working with others</b>	Work frequently in pairs.
	Lead construction teams while working with other tradespersons, forepersons, suppliers and engineers.
	Work as a team to promote safety.
<b>Thinking</b>	Adapt routine tasks when working in a confined space.
	Consult other carpenters to share knowledge and experience.
	Refer to blueprints and specifications to obtain detailed project information.
	Analyze blueprints and actual measurements to identify errors.
	Make decisions to use materials efficiently.
	Make decisions about constructing and building structures, such as decks, stairs and platforms.
<b>Digital technology</b>	Use computer-controlled equipment, such as total stations, smart levels and workplace alarm systems.
<b>Continuous learning</b>	Keep up-to-date with codes, regulations, standards and materials.
	Keep up-to-date with emerging skills and methods from technological advancements.

The essential skills have trade-specific wording and emphases. The list put together for carpenters will be rated here, and the same rating applied for the trade-specific knowledge skills analysis will be used (See Appendix 1 for details).

### *Rating essential skills*

We used the following assumptions and protocols to rate the essential skills:

- Ratings are applied to holders of the credential, i.e., CofQ with Red Seal endorsement, NC(V), Section 26(D), or Learnership.
- The rating and color coding used is that shown in Appendix 1 Tables 6 and 7.
- Assign a rating of 7 / 70%<sup>14</sup> for a skill that has been delivered during the (formal) training.

---

<sup>14</sup> We used 7 / 70% to mimic the cut score required for certification on Red Seal examinations; we also defined 7 / 70% as a carpenter's the putative ability to do the task on his/her own.

## Integrating Newcomers

---

- Assign a rating of 7 / 70% for a skill that is listed in the NOA – and possibly tested in the Red Seal examination - for BC challengers.
- Assign a rating of 8 / 80% for a skill for which there is evidence of advanced training or that the skill must be practiced in complete autonomy.
- Assign a rating of 1 for those skills that do not appear in the documents but is likely mastered.
- Assign a rating of 0 if the skill is clearly out of scope.
- Use Grade 9 + technical training to rate South African learners – but normed to Grade 12 since the required NQF Level 4 (the most common in the Trades programs) is equivalent to Grade 12 in South Africa.
- Use Grade 10<sup>15</sup> + technical training to rate BC apprentices.
- Maximum rating is 9 / 90% indicating that the carpenter could teach others the skill being rated.
- Ratings were assigned regardless of language, only for presence and level.

### Essential skills ratings results

The results are presented by skills and competency in Table 4, and summarized by skill category in Figure 2 below.

**Table 4.** Comparison of BC apprentice, BC challenge, and South African programs against Essential Skills for Carpenters

Essential Skill	Competency	Max rating	Red Seal CofA + CofQ	Red Seal CofQ	NC(V)
Reading	Read project specifications to understand what is required for a project.	9	7	7	7
	Read specification books and notes on blueprints.	9	7	7	7
	Read and understand first aid and safety reports.	9	7	7	7
	Read and understand safety inspection manuals.	9	7	7	7
	Read and interpret building codes, regulations and standards to comply with regulations.	9	7	7	7
	Read installation manuals.	9	7	7	7
	Read industry trade magazines to learn about technological advancements, such as new construction materials and methods.	9	1	1	1
		63	43	43	43
		100%	68%	68%	68%
Document use	Interpret labels such as the Workplace Hazardous Materials Information System (WHMIS) to follow safety guidelines.	9	7	7	1
	Interpret signs for information about directions, cautions and safety procedures.	9	7	7	7

<sup>15</sup> The ITA website states: Recommended Education The following education is recommended for apprentices entering this occupation. These are not prerequisites, but rather a desired level of skill or knowledge that will contribute to success in the industry ... Grade 10 or equivalent including English 10, Mathematics 10, and Science 10.

## Integrating Newcomers

---

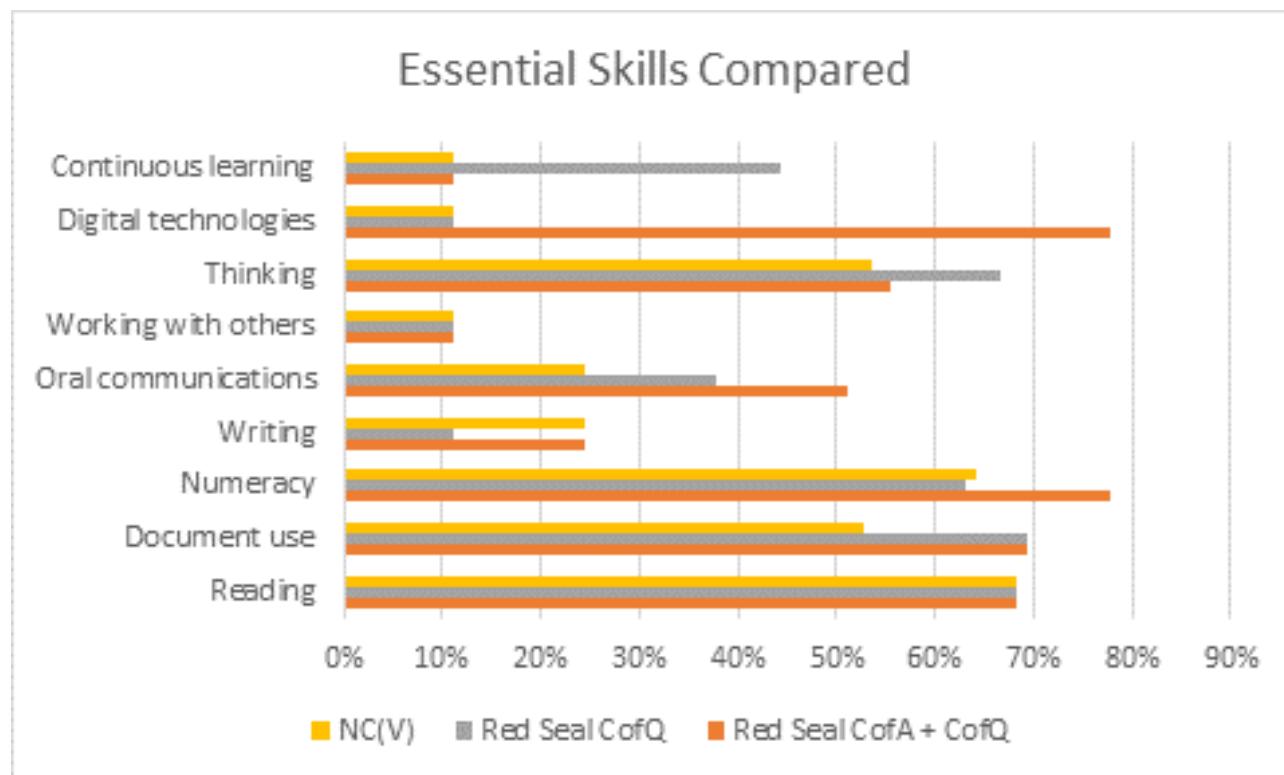
Essential Skill	Competency	Max rating	Red Seal CofA + CofQ	Red Seal CofQ	NC(V)
Technical Skills	Complete time cards to record work hours.	9	1	1	1
	Interpret shop drawings and specifications for the sizes, locations and types of materials required for a job.	9	7	7	7
	Prepare lists of materials.	9	7	7	7
	Make sketches of drawings or plans to use on job sites.	9	7	7	7
	Refer to load charts to determine load bearing capacities when operating material handling equipment.	9	7	7	1
	Interpret blueprints to verify measurements, determine the integrity of plans and to report mistakes.	9	7	7	7
		72	50	50	38
			69%	69%	53%
	Estimate how long it will take to complete a job.	9	7	7	7
	Calculate the quantity of materials needed for a job, such as the volume of concrete required for footings.	9	7	7	7
Numeracy	Convert between metric and imperial measurement systems.	9	7	7	1
	Verify bills when purchasing tools, accounting for discounts and taxes.	9	7	1	7
	Analyze survey data for excavations to draw conclusions about safety.	9	7	7	8
	Take precise measurements using survey instruments.	9	7	7	1
	Make scale drawings.	9	7	1	7
	Calculate stringers, treads and risers to build stairs.	9	7	7	7
	Calculate a rafter line length using the measurements of rise and run.	9	7	7	7
		81	63	51	52
			78%	63%	64%
	Record information on work activities such as problems encountered and resolved and hours of work.	9	1	1	1
Writing	Write purchase orders for materials.	9	7	1	7
	Write safety and accident reports.	9	1	1	1
	Write change orders to recommend blueprint modifications.	9	1	1	1
	Write reports for project meetings.	9	1	1	1
		45	11	5	11

## Integrating Newcomers

Essential Skill	Competency	Max rating	Red Seal CofA + CofQ	Red Seal CofQ	NC(V)
		24%	11%	24%	
Oral communication	Talk to suppliers to order materials or compare prices.	9	7	1	7
	Interact with other carpenters to discuss work schedules, safety concerns and to share ideas.	9	7	7	1
	Communicate with a foreperson to report on work progress and troubleshoot problems.	9	7	7	1
	Talk to manufacturer representatives to discuss problems with equipment and materials.	9	1	1	1
	Interact with owner(s) to discuss new ideas and potential changes.	9	1	1	1
		45	23	17	11
Working with others			51%	38%	24%
	Work frequently in pairs.	9	1	1	1
	Lead construction teams while working with other tradespersons, forepersons, suppliers and engineers.	9	1	1	1
	Work as a team to promote safety.	9	1	1	1
		27	3	3	3
			11%	11%	11%
Thinking	Adapt routine tasks when working in a confined space.	9	7	7	0
	Consult other carpenters to share knowledge and experience.	9	7	1	1
	Refer to blueprints and specifications to obtain detailed project information.	9	7	7	7
	Analyze blueprints and actual measurements to identify errors.	9	1	7	7
	Make decisions to use materials efficiently.	9	1	7	7
	Make decisions about constructing and building structures, such as decks, stairs and platforms.	9	7	7	7
Digital technology		54	30	36	29
			56%	67%	54%
Continuous learning	Use computer-controlled equipment, such as total stations, smart levels and workplace alarm systems.	9	7	1	1
		9	7	1	1
			78%	11%	11%
	Keep up-to-date with codes, regulations, standards and materials.	9	1	7	1
	Keep up-to-date with emerging skills and methods from technological advancements.	9	1	1	1
		18	2	8	2
			11%	44%	11%
	Grand total	415	232	214	190

## Integrating Newcomers

Essential Skill	Competency	Max rating	Red Seal CofA + CofQ	Red Seal CofQ	NC(V)
	Grand total %		56%	52%	46%



**Figure 2.** Essential skills compared as a match percentage by skill; BC Apprenticeship, BC Challenge, and South African NC(V)

### Essential skills ratings interpretation – general remarks

Essential skills for carpenters reflect what they would need to be able to work safely, effectively and efficiently. These skills also reflect those cognitive abilities that would be required to have a career in carpentry. Many of those skills are those developed through compulsory education. One thinks of formal skills such as reading, writing, counting, manipulating symbols and formulae, distilling data from diverse sources and media, developing relationship skills, and making sense of complex situations as must-haves. But we have to recognize that many of these skills are further refined or broadened when young students navigate the sea of digital data, form, develop, and maintain friendships.

Yet the formal, cognitive skills, are acquired at school. Further, in general, we expect that once a student leaves the K-12 system they have been internalized.

### Essential skills ratings interpretation – specific remarks

#### *The 3Rs*

Both the BC Program Outline (PO) and the NOA reflect that assumption. Granted, the BC PO sets aside some time to review (or learn for the first time) basic mathematical concepts, and, through interpretive

## *Integrating Newcomers*

---

exercises of documents develops reading – and perhaps writing – skills. The NOA simply lists the skills / knowledge as a presumed ability.

In contrast, the South African programs, even though the minimum entry levels might be lower than those recommended for BC, require the learners to meet secondary education qualifications in math science and English at a minimum. The breadth and depth of the courses South African would-be carpenters take either at the TVETs appears to exceed what the BC applied programs offer.

### *Language skills*

It stands to reason that a South African graduate who had not practiced English at work and whose native language is one the 11 official languages in South Africa (Afrikaans, Zulu, and English are most common) would find it, at first, difficult to function in an English only-speaking environment, even if he/she had the carpentry skills.

### *Units of measurement*

BC carpenters work using imperial measurements. But they are at ease with the International System of Units (SI). Not so in South Africa: South African carpenters work exclusively in the SI system (it converted to the metric system in 1922).

### *Digital technology*

There seems to be little emphasis on computers in general. At the personal level, this is probably more a reflection of the ability of people to afford digital technology for the home; there is no doubt that the TVETs have computer labs and use them in the training programs. It is unclear how common expensive electronic tools are available in the workplace in South Africa. In BC, however, the use of siting and leveling laser tools – and of portable tools - is emphasized but the rest of building technology tools are not emphasized or, at times, mentioned.

### *Safety – Confined space / environment*

As noted earlier, the safety approach in South Africa is similar than in BC. The South African programs focus on identifying and mitigating hazardous situations in general rather than focusing on specific high risk situations.

Environmental safety is covered in theory classes in South Africa but not in BC.

## Comparing program levels – Trade skills

Here we compare the program elements to identify commonalities, differences, and gaps between the BC apprenticeship, the BC challenge (relying on the NOA), and the South African NC(V). While all programs are structured hierarchically, the nomenclature and number of levels vary from program to program. Table 5 below summarizes the levels and how we compared them. Blanks in the table indicate that there was no direct comparison possible, or that the comparison would yield over-complicated results. For example, we decided that the “Block” level at the NOA, which arguably better corresponds to General Areas of Competence (GACs), was better left out of the comparative analysis.

An additional level of difficulty is that the BC, federal, and South African documents are structurally – where structure is most likely reflective of the “philosophy” of the documents’ authors – quite different. For example, the BC PO, called a “Program Overview” listing “suggested time allocations”, is tailored to the delivery of technical training for BC apprentices – and is, most probably the results of some sort of ITA-channelled consensus between industry and all the training institutions that deliver the training. Like the BC PO, the NOA is also a jurisdictionally-mediated consensual product but limits itself to a Task Analysis depicting the “average” Canadian carpenter; and the NOA makes no pretense to link up with the world of training. And the South African program is a reasoned collection of modules each made up of “registered” qualifications: they describe what behaviors are expected in the trade and assemble them into a training (and assessment) program.

Moreover, the South African programs are all aligned to the Curriculum document approved by COQTO. This document lists each of the knowledge and “shop” modules broken down further into competencies which are then cross-referenced to content elements – all of these are numbered and registered with the national body. While the NOA also lists key competencies and knowledge, it does so using a cursory list of statements, none of which are cross-referenced to each other or specific knowledge. Finally, the BC PO mixes things in a random fashion: “Perform Trade Math”, “Describe Roofing Materials”, and “Installs Doors and Hardware” are structurally equivalent in the PO – all competencies. The BC approach is similar to that used in South Africa but not as rigorous.

We conducted the analysis using the BC PO as the reference document. That is, we looked in the NOA and the South African program documents for similarities to the BC GACs and Competencies and listed those. From the South African curriculum, we used both the Knowledge and Practical “sub-modules”. For example, to equate the BC PO “A1 – Apply Shop and Site Safety Practices”, we had to use sub-sub-modules for the knowledge component (KM-01-KT05 “Theories and principles of relevant legislation, regulations and codes” and KM-01-KT06 “Principles of first Aid”) and these were not represented in the practical or work experience modules.

The numerical ratings, as previously, was taken from Table 15 (Appendix 1). Also, as before, when rating safety competencies, we rated them according to the training/credentialing jurisdiction. Clearly, a South African carpenter coming to BC would require an orientation to “the way BC does business” such as regulations, but not in the basics like working at heights, wearing PPE, preventing accidents, etc. The same would apply to a BC carpenter moving to South Africa.

## *Integrating Newcomers*

---

As we used the BC PO as the reference, we have assigned a value of 7 – using the same rationale as above - to all of the competencies there, and assigned estimated ratings to the NOA and South African program elements with reference to the BC rating or, when possible, absolutely.

**Table 5.** Comparative program structure elements by name – highlighted cells indicate elements used in the analysis

Jurisdiction		
Program elements	British Columbia - BCPO	Red Seal/Federal - NOA
	Block	COQTO - Carpenter
		Knowledge
		Practical Skill
	GAC - "Line"	Work Experience
		Modules
		"Sub-module"
	Competency	Sub-task
	Learning tasks	Key competencies
Content	Knowledge	Competencies
		Knowledge modules
		Applied knowledge
Objective		
	Assessment criteria	

### Comparing General Areas of Competence (GAC) – Knowledge & Abilities

Using the BC Program Overview (BC PO) as the reference, we searched the NOA and Curriculum for equivalent entries. The rationale to assign ratings to the NOA and South African equivalents was as follows:

- Use 9 if they appear to be much superior in “breadth and depth” (total autonomy; innovative).
- Use 8 if they appear to be superior in “breadth and depth” (more content; more activities; greater difficulty).
- Use 7 if they appear to be the same in “breadth and depth”.
- Use 6 if they appear to be inferior in “breadth and depth” (less content; fewer activities; simpler).
- Use 0 if there is no direct reference to the GAC or competency.

It is important to keep in mind that the ratings are here to help summarize complex, ill-matched documents in a single indicator. The numbers are not indicative of the trade as a whole or individual carpenters, nor are they suitable to establish some sort of pecking order in either the jurisdictions, programs, credentials, or people.

As the scale is ordinal, we have steered away from mathematical manipulations except to normalize counts – using the categorical number of entries over the largest number of entries as a reverse factor - in order to get a clearer picture. Reporting counts and the attached ratings provides an overall picture of the differences and might help in making decisions about remedial interventions.

However, we have added an “average rating” calculated value to provide a very rough – and mathematically unjustifiable; see Appendix 2 under “quantitative” for details – measure of comparison between the 3 programs.

## Integrating Newcomers

---

### Results

By definition, the BC PO has the largest number of “7” (10 normed to 20). Only the NOA has “8” (3 normed to 3). Also, both the NOA and the South African programs have a substantial number of “7”, (14 normed to 14 and 14 normed to 16, respectively). The South African program only has some “6” (4 normed to 4) and only the NOA shows “0” entries (2 normed to 2). The detailed entries are provided in Table 6, the summary count in Table 7, and the normed counts in Figure 3.

**Table 6.** Rated comparisons at the GAC level - BC PO is the reference; colors and ratings as above, expounded in Appendix 1

British Columbia – BC PO			Red Seal / Federal - NOA			South African Curriculum - NC(V)		
Line		Rating	Task		Rating	Sub-modules		Rating
A	Safe work Practices	7	2	Performs safety related activities	6	KM-01-KT05	Theories and principles of relevant legislation, regulations and codes	6
							Principles of first Aid	
B	Documentation and Organizational Skills	7	5	Interprets documentation	7	PM-01-PS01	Read and Interpret Drawings	7
							Set out and prepare construction carpentry work areas	
C	Tools and Equipment	7	1	Uses and maintains tools and equipment	7	PM-02-PS01	Identify, use and maintain carpentry tools, materials and equipment	7
D	Survey Instruments and Equipment	7			0	PM-01-PS03	Set out and prepare construction carpentry work areas	7
E	Access, Rigging and Hoisting Equipment	7	4	Builds and uses temporary access structures	7	KM-01 - KT04	Concepts, theories and principles of access equipment for construction work	6
F	Site Layout	7	7	Performs layout	7	PM-01-PS02	Determine and transfer levels	7
G	Concrete Formwork	7	8	Constructs formwork	7	PM-04-PS01	Erect beams and cast slabs	7
						PM-04-PS02	Erect formworks for columns	7
						PM-04-PS03	Erect formwork for walls	7
H	Wood Frame Construction	7	10	Constructs floor systems	7	PM-03-PS03	Install return stairs	8
			11	Constructs deck systems	7	PM-05-PS01	Install ceilings and Partitions	8
			12	Constructs wall systems	7	PM-05-PS02	Manufacture and erect roof trusses	8
			13	Constructs roof and ceiling systems	7			

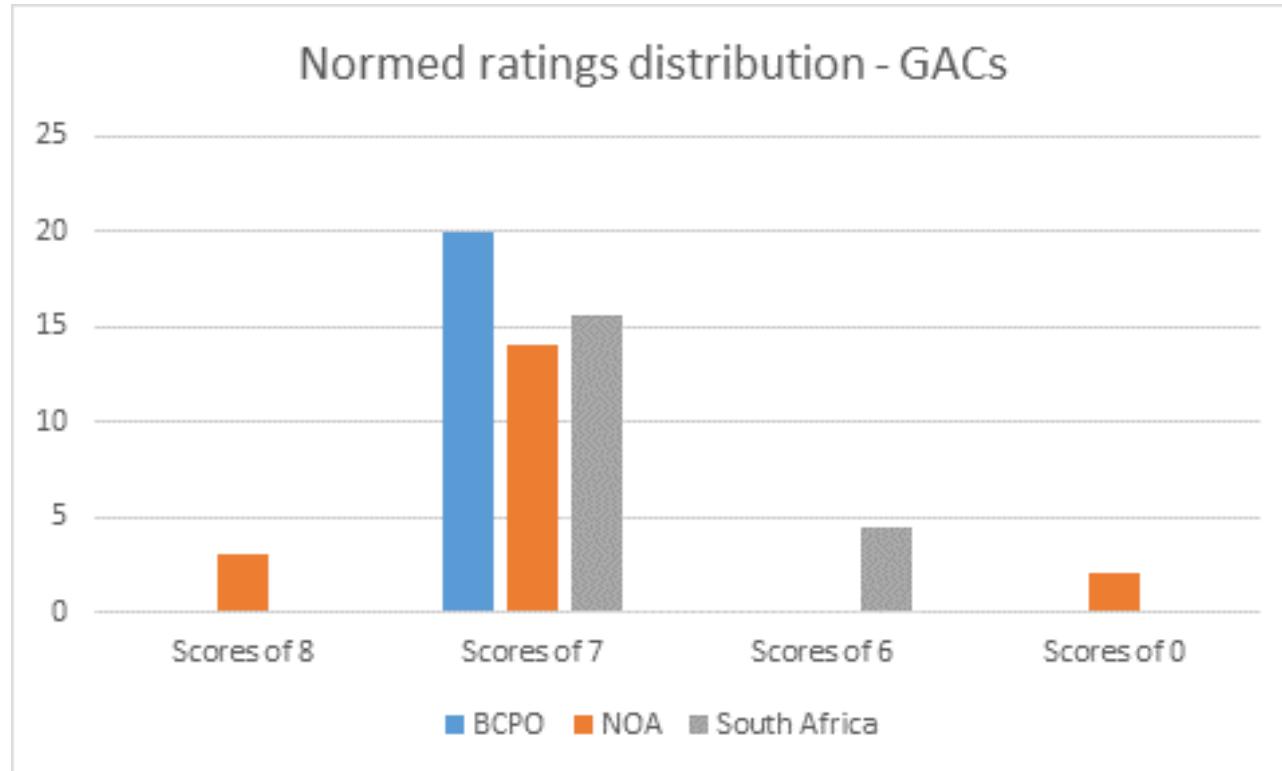
## *Integrating Newcomers*

---

British Columbia – BC PO			Red Seal / Federal - NOA			South African Curriculum - NC(V)		
Line		Rating	Task		Rating	Sub-modules		Rating
			21	Performs renovation-specific support activities	8			
			22	Performs renovation-specific construction activities	8			
I	Finishing Materials	7	14	Installs exterior doors and windows	7	PM-06-PS02	Position and install finishing components	7
			16	Installs exterior finishes	7	PM-07-PS01	Install finishing components	7
			17	Installs wall and ceiling finishes	7	PM-07-PS02	Prepare and erect panelling	7
			18	Installs flooring	7			
			19	Installs interior doors and windows	7			
J	Building Science	7			0	KM-01 - KT10	Properties, characteristics, functions and uses of different materials in building and construction	6

**Table 7.** Summary count of comparison ratings at the GAC level – BC PO is the reference

	British Columbia – BC PO	Red Seal / Federal - NOA	SA Curriculum - NC(V)
Total number ratings	10	20	18
Total of ratings	70	128	122
Ratings of 8	0	3	0
Ratings of 7	10	14	14
Ratings of 6	0	0	4
Ratings of 0	0	2	0
Average rating	7	6.4	6.8



**Figure 3.** Normed ratings distribution for BC's apprentice program (BCPO), the BC Challenger program (NOA), and the South African – at the GAC / Task / Sub-module level

#### Comparing competencies – Hands-on skills & knowledge

Using the BC Program Overview (BC PO) as the reference, we searched the NOA and Référentiel for equivalent entries. The rationale to assign ratings to the NOA and South African equivalents was as follows:

- Use 9 if they appear to be much superior in “breadth and depth” (total autonomy; innovative).
- Use 8 if they appear to be superior in “breadth and depth” (more content; more activities; greater difficulty).
- Use 7 if they appear to be the same in “breadth and depth”.
- Use 6 if they appear to be inferior in “breadth and depth” (less content; fewer activities; simpler; or covered as a small (weight<5%) theory event).
- Use 0 if there is no direct reference to the GAC or competency.

It is important to keep in mind that the ratings are here to help summarize complex, ill-matched documents in a single indicator. The numbers are not indicative of the trade as a whole or individual carpenters, nor are they suitable to establish some sort of pecking order in either the jurisdictions, programs, credentials, or people.

As the scale is ordinal, we have steered away from mathematical manipulations except to normalize counts – using the categorical number of entries over the largest number of entries as a reverse factor – in order to get a clearer picture. Reporting counts and the attached ratings provides an overall picture of the differences and might help in making decisions about remedial interventions.

## *Integrating Newcomers*

---

However, we have added an “average rating” calculated value to provide a very rough – and mathematically unjustifiable; see Appendix 1 for details – measure of comparison between the 3 programs.

### *Results*

By definition, the BC PO has the largest number of “7” (50 normed to 69). The NOA has a substantial number of “8”, South Africa has one (17 normed to 17 and 1 normed to 1, respectively). Also, the NOA and the South African program have a substantial number of “7” (33 normed to 33 and 19 normed to 23, respectively). And the NOA and the South African program both have some “6” (3 normed to 3 and 17 normed to 23, respectively) but many “0” entries (16 normed to 16 and 17 normed to 21, respectively). The detailed entries are provided in Table 8, the summary count in Table 9, and the normed counts in Figure 4.

**Table 8.** Rated comparisons at the competency level - BC PO is the reference; colors and ratings as above, expounded in Appendix 1

British Columbia – BC PO		Red Seal / Federal - NOA			SA Curriculum NC(V)		
Competency		Rating	Sub-task		Rating	Practical skills / topics	Rating
A1	Apply Shop and Site Safety Practices	7	2.02	Maintains safe work environment	6	KT0601	Types of potential hazards and emergency situations
						KT0602	Principles of documenting emergency procedures
						KT0603	Types of injuries
						KT0606	Types of visible vital signs, signs of shock and first aid
A2	Apply Personal Safety Practices	7	2.01	Uses Personal Protective Equipment (PPE) and safety equipment	7	ST0504	Aspects of the Occupational Health and Safety Act applicable to construction
B1	Describe the Carpentry Trade	7			0	KT0101	Structure of the construction industry
B2	Use Construction Drawings and Specifications	7	5.01	Interprets project drawings	7	KM-01 -KT02	Concepts and principles of reading and interpreting drawings and specifications
						PM-01 -PS01	Read and interpret drawings
B3	Interpret Building Codes and Bylaws	7			0	AK0303	National Building Regulations and Occupational Health and Safety legislation

## Integrating Newcomers

British Columbia – BC PO			Red Seal / Federal - NOA			SA Curriculum NC(V)		
Competency		Rating	Sub-task		Rating	Practical skills / topics		Rating
B4	Plan and Organize Work	7	6.01	Schedules work sequence	7	PA0302	Stack, store and position materials, tools and equipment	6
			6.02	Performs site preparation	7	KT0801	Principles and procedures of procurement of different materials, tools and equipment types	6
			6.03	Performs quantity take-off	7	PA0303	Stack, store and position materials, tools and equipment	6
			6.04	Organizes materials	7	PA0302	Assess equipment infrastructure requirements	6
B5	Perform Trade Math	7			0			0
C1	Use Hand Tools	7	1.01	Maintains hand, power, and pneumatic tools	7	PM-02-PS01	Identify, use and maintain carpentry tools, materials and equipment	7
C2	Use Portable Power Tools	7	1.01	Maintains hand, power, and pneumatic tools	7	PM-02-PS01	Identify, use and maintain carpentry tools, materials and equipment	7
C3	Use Stationary Power Tools	7	1.02	Maintains stationary tools	7	PM-02-PS01	Identify, use and maintain carpentry tools, materials and equipment	7
C4	Use Oxy-Fuel Equipment	7	1.07	Uses torch cutting equipment	7			0
D1	Use Levelling Instruments and Equipment	7			0	PM-01-PS02	Determine and transfer levels	6
D2	Use Site Layout Equipment	7			0	PM-01-PS02	Determine and transfer levels	6
E1	Use Ladders, Scaffold, and Access Equipment	7	4.03	Erects, dismantles scaffolding	8	KM-01-KT04	Concepts, theories and principles of access equipment for construction work	7
E2	Use Rigging and Hoisting Equipment	7	1.04	Uses lifting, rigging, and hoisting equipment	7			0
F1	Layout Building Locations	7	7.01	Performs site layout	7	PM-01-PS02	Determine and transfer levels	6
F2	Prepare Building Site	7			0	PM-01-PS02	Determine and transfer levels	6

## Integrating Newcomers

British Columbia – BC PO			Red Seal / Federal - NOA			SA Curriculum NC(V)		
Competency		Rating	Sub-task		Rating	Practical skills / topics		Rating
F3	Apply Excavations and Shoring Practices	7	8.01	Erects excavation shoring and underpinning	8	KM-01-KT14	Theories and principles for shoring trenches/excavations	7
						KM-01-KT14:	Principles and concepts for mixing mortar and concrete	7
						PM-03-PS01	Conduct timber shoring	7
G1	Use Concrete Types, Materials, Additives and Treatments	7			0			0
G2	Select Concrete Forming Systems	7			0			0
G3	Build Footing and Vertical Formwork	7	8.02	Erects concrete falsework	7	PA0201	Erect steel formwork to for lift shaft on provided starter nib	7
			8.03	Constructs footing forms	7	PA0204	Align formwork and stays to be secure	7
G4	Build Slab-On-Grade Forms and Suspended Slab Forms	7	8.05	Constructs slab-on-grade formwork	6	PM-04-PS01	Erect beams and cast slabs	7
G5	Install Reinforcement and Embedded Items	7	8.08	Installs embedded steel	7	PA0202	Secure steel reinforcing in position	7
G6	Build Concrete Stair Forms	7	8.07	Constructs stair formwork	7	PM-03-PS03	Install return stairs	7
G7	Place and Finish Concrete	7	9.01	Places concrete	7			0
			9.03	Performs basic concrete finishing	8			
G8	Install Specialized Formwork	7	8.06	Constructs column formwork	7	PM-04-PS02	Erect formworks for columns	7
			9.04	Installs pre-cast components	8	PM-04-PS03	Erect formworks for walls	7
			9.05	Installs grout	8			
H1	Describe Wood Frame Construction	7			0			0
H2	Select Framing Materials	7			0	KT0801	Principles and procedures of procurement of different materials, tools and equipment types	6
H3	Build Floor Systems	7	10.02	Constructs dimensional lumber floor framing	7			0

## Integrating Newcomers

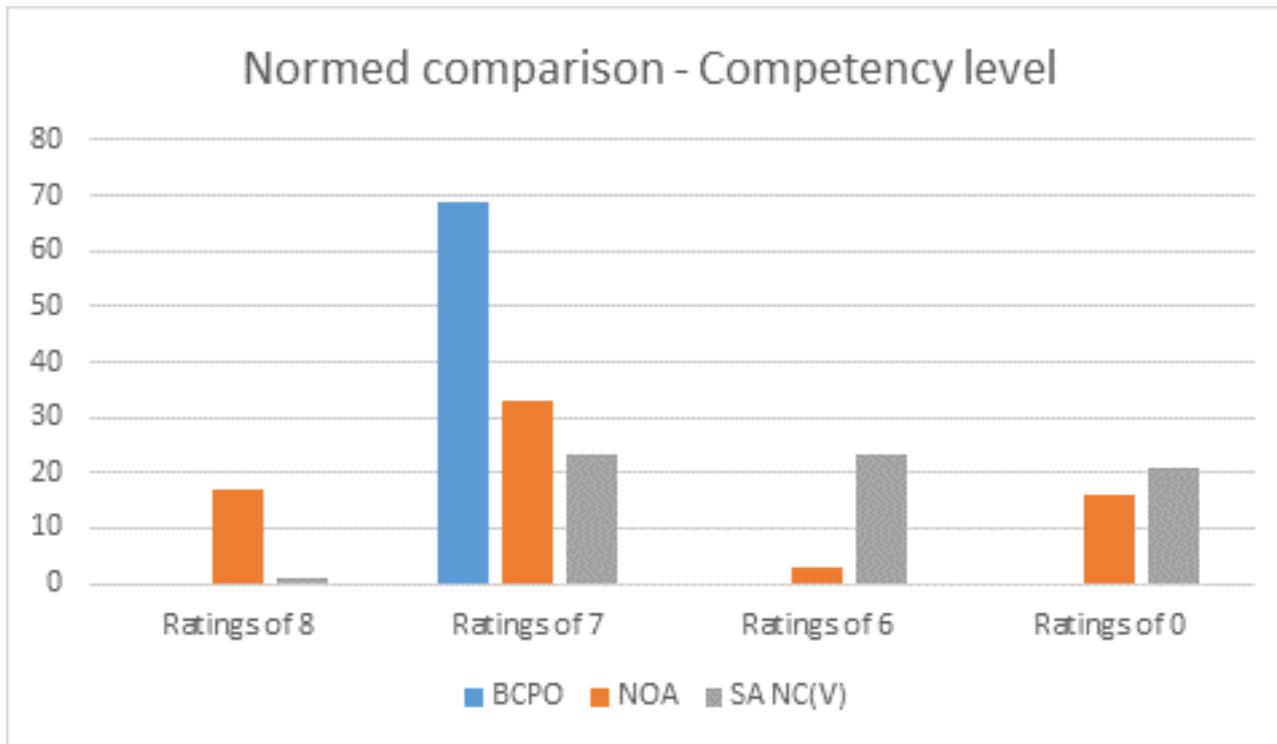
British Columbia – BC PO			Red Seal / Federal - NOA			SA Curriculum NC(V)		
Competency		Rating	Sub-task		Rating	Practical skills / topics		Rating
H4	Build Wall Systems	7	12.02	Constructs dimensional lumber wall framing	7	PM-05-PS01	Install ceilings and Partitions	7
H5	Build Stair Systems	7	20.03	Constructs stairs	7	PM-03-PS03	Install return stairs	7
H6	Build Roof Systems	7	13.02	Constructs roof and ceiling framing	7	PM-05-PS02	Manufacture and erect roof trusses	
H7	Build Specialized Framing Systems	7			0			0
H8	Perform Renovations and Additions	7	21.01	Removes existing material	8			0
			21.02	Protects structure during renovations	8			
			22.01	Joins new to existing construction	8			
			22.02	Changes existing structure during renovations.	8			
H9	Build Timber and Engineered Wood Construction	7	10.01	Installs engineered floor systems	8			0
			12.01	Installs engineered wall systems	8			
			13.01	Installs engineered trusses	8			
H10	Build Decks and Exterior Structures	7	11.01	Constructs decks	7			0
I1	Describe Roofing Materials	7			0	PM-06-PS01	Clad roof structures with a range of materials	8
I2	Install Doors and Hardware	7	14.01	Installs exterior jambs/frames	7	PM-07-PS01	Install finishing components	6
			14.02	Installs exterior doors	7			
			19.01	Installs interior jambs/frames	7			
			19.02	Installs interior doors	7			
I3	Install Windows and Hardware	7	14.04	Installs exterior windows	7	PM-07-PS01	Install finishing components	6
			14.05	Installs exterior doors and windows hardware	7			
			19.04	Installs interior windows	7			
			19.05	Installs interior doors and windows hardware	7			

## Integrating Newcomers

British Columbia – BC PO			Red Seal / Federal - NOA			SA Curriculum NC(V)		
Competency		Rating	Sub-task		Rating	Practical skills / topics		Rating
I4	Install Exterior Finishes	7	16.01	Installs exterior wall components	7			0
			16.02	Installs exterior wall coverings	7			
I5	Install Interior Finishes	7	17.01	Installs wallboard	8	PM-07-PS01	Install finishing components	6
			20.02	Install finish components and accessories	8			
I6	Install Cabinets	7			0			0
I7	Install Interior Floor, Ceiling and Wall Systems	7	17.03	Installs panels, tiles and solid wood finishes	8	PM-05-PS01	Install ceilings and Partitions	7
			17.04	Installs suspended ceilings	8			
			17.05	Installs demountable wall systems	8			
J1	Control the Forces Acting on a Building	7			0			0
J2	Control Heat and Sound Transmission	7			0			0
J3	Control Air and Moisture Movement in Buildings	7			0			0

**Table 9.** Summary count of comparison ratings at the competency level – BC PO is the reference

	British Columbia – BC PO	Red Seal / Federal - NOA	SA Curriculum NC(V)
Total number ratings	47	69	56
Total of ratings	329	385	255
Ratings of 8	0	17	1
Ratings of 7	47	33	19
Ratings of 6	0	3	19
Ratings of 0	0	16	17
Average rating	7	5.5	5



**Figure 4.** Normed ratings distribution for BC's apprentice program (BCPO), the BC Challenger program (NOA), and the South African NC(V) – at the competency / sub-task / Compétences détaillées level

### Gaps - Competencies

When compared to the BC PO, and using the rating protocol explained above, both the NOA and South African programs show gaps. For the purpose of this classification, we have defined as gap any competency that did not match the equivalent BC competency standard rating, i.e. rating<7, or that was not listed or readily surmised from those listed.

Clearly a gap indicated by a rating of 6 ought to be seen as less absolute as one showing a rating of 0. This is because a 0 indicates that the competency is entirely absent the document or program. Table 10 shows the three-way comparison and gap. Tables 11 and 12 show the NOA and South African gaps respectively.

**Table 10.** Rated gap competencies - BC PO is the reference; colors and ratings as above, expounded in Appendix 1

British Columbia – BC PO			Red Seal / Federal - NOA			SA Curriculum NC(V)	
Competency		Rating	Sub-task		Rating	Practical skills / topics	Rating
A1	Apply Shop and Site Safety Practices	7	2.02	Maintains safe work environment	6	KT0601	Types of potential hazards and emergency situations
						KT0602	Principles of documenting emergency procedures
						KT0603	Types of injuries

## Integrating Newcomers

British Columbia – BC PO		Red Seal / Federal - NOA			SA Curriculum NC(V)		
Competency		Rating	Sub-task		Rating	Practical skills / topics	Rating
						KT0606 Types of visible vital signs, signs of shock and first aid	6
A2	Apply Personal Safety Practices	7	2.01	Uses Personal Protective Equipment (PPE) and safety equipment	7	ST0504 Aspects of the Occupational Health and Safety Act applicable to construction	6
B1	Describe the Carpentry Trade	7			0	KT0101 Structure of the construction industry	6
B3	Interpret Building Codes and Bylaws	7			0	AK0303 National Building Regulations and Occupational Health and Safety legislation	6
B4	Plan and Organize Work	7	6.01	Schedules work sequence	7	PA0302 Stack, store and position materials, tools and equipment	6
			6.02	Performs site preparation	7	KT0801 Principles and procedures of procurement of different materials, tools and equipment types	6
			6.03	Performs quantity take-off	7	PA0303 Stack, store and position materials, tools and equipment	6
			6.04	Organizes materials	7	PA0302 Assess equipment infrastructure requirements	6
B5	Perform Trade Math	7			0		0
C4	Use Oxy-Fuel Equipment	7	1.07	Uses torch cutting equipment	7		0
D1	Use Levelling Instruments and Equipment	7			0	PM-01 -PS02 Determine and transfer levels	6
D2	Use Site Layout Equipment	7			0	PM-01 -PS02 Determine and transfer levels	6
E2	Use Rigging and Hoisting Equipment	7	1.04	Uses lifting, rigging, and hoisting equipment	7		0
F1	Layout Building Locations	7	7.01	Performs site layout	7	PM-01 -PS02 Determine and transfer levels	6
F2	Prepare Building Site	7			0	PM-01 -PS02 Determine and transfer levels	6
G1	Use Concrete Types, Materials, Additives and Treatments	7			0		0

## Integrating Newcomers

British Columbia – BC PO		Red Seal / Federal - NOA			SA Curriculum NC(V)			
Competency		Rating	Sub-task		Rating	Practical skills / topics		Rating
G2	Select Concrete Forming Systems	7			0			0
G4	Build Slab-On-Grade Forms and Suspended Slab Forms	7	8.05	Constructs slab-on-grade formwork	6	PM-04-PS01	Erect beams and cast slabs	7
G7	Place and Finish Concrete	7	9.01	Places concrete	7			0
H1	Describe Wood Frame Construction	7			0			0
H2	Select Framing Materials	7			0	KT0801	Principles and procedures of procurement of different materials, tools and equipment types	6
H3	Build Floor Systems	7	10.02	Constructs dimensional lumber floor framing	7			0
H7	Build Specialized Framing Systems	7			0			0
H8	Perform Renovations and Additions	7	21.01	Removes existing material	8			0
H9	Build Timber and Engineered Wood Construction	7	10.01	Installs engineered floor systems	8			0
H10	Build Decks and Exterior Structures	7	11.01	Constructs decks	7			0
I1	Describe Roofing Materials	7			0	PM-06-PS01	Clad roof structures with a range of materials	8
I2	Install Doors and Hardware	7	14.01	Installs exterior jambs/frames	7	PM-07-PS01	Install finishing components	6
I3	Install Windows and Hardware	7	14.04	Installs exterior windows	7	PM-07-PS01	Install finishing components	6
I4	Install Exterior Finishes	7	16.01	Installs exterior wall components	7			0
I5	Install Interior Finishes	7	17.01	Installs wallboard	8	PM-07-PS01	Install finishing components	6
I6	Install Cabinets	7			0			0
J1	Control the Forces Acting on a Building	7			0			0
J2	Control Heat and Sound Transmission	7			0			0

## Integrating Newcomers

---

British Columbia – BC PO			Red Seal / Federal - NOA		SA Curriculum NC(V)			
Competency		Rating	Sub-task		Rating	Practical skills / topics		Rating
J3	Control Air and Moisture Movement in Buildings	7			0			0

**Table 11.** Gaps between BC PO and BC Challenger (NOA)

British Columbia – BC PO			Red Seal / Federal - NOA			
Competency		Rating	Sub-Task			Rating
A1	Apply Shop and Site Safety Practices	7	2.02	Maintains safe work environment	6	
B1	Describe the Carpentry Trade	7			0	
B3	Interpret Building Codes and Bylaws	7			0	
B5	Perform Trade Math	7			0	
D1	Use Levelling Instruments and Equipment	7			0	
D2	Use Site Layout Equipment	7			0	
F2	Prepare Building Site	7			0	
G1	Use Concrete Types, Materials, Additives and Treatments	7			0	
G2	Select Concrete Forming Systems	7			0	
G4	Build Slab-On-Grade Forms and Suspended Slab Forms	7	8.05	Constructs slab-on-grade formwork	6	
H1	Describe Wood Frame Construction	7			0	
H2	Select Framing Materials	7			0	
H7	Build Specialized Framing Systems	7			0	

## Integrating Newcomers

---

British Columbia – BC PO			Red Seal / Federal - NOA		
Competency		Rating	Sub-Task		Rating
I1	Describe Roofing Materials	7			0
I6	Install Cabinets	7			0
J1	Control the Forces Acting on a Building	7			0
J2	Control Heat and Sound Transmission	7			0
J3	Control Air and Moisture Movement in Buildings	7			0

**Table 12.** Gaps between the BC PO and the NC(V)

British Columbia – BC PO			SA Curriculum NC(V)		
Competency		Rating	Practical skills / topics		Rating
A1	Apply Shop and Site Safety Practices	7	KT0601	Types of potential hazards and emergency situations	6
			KT0602	Principles of documenting emergency procedures	6
			KT0603	Types of injuries	6
			KT0606	Types of visible vital signs, signs of shock and first aid	6
A2	Apply Personal Safety Practices	7	ST0504	Aspects of the Occupational Health and Safety Act applicable to construction	6
B1	Describe the Carpentry Trade	7	KT0101	Structure of the construction industry	6
B3	Interpret Building Codes and Bylaws	7	AK0303	National Building Regulations and Occupational Health and Safety legislation	6
B4	Plan and Organize Work	7	PA0302	Stack, store and position materials, tools and equipment	6
			KT0801	Principles and procedures of procurement of different materials, tools and equipment types	6
			PA0303	Stack, store and position materials, tools and equipment	6
			PA0302	Assess equipment infrastructure requirements	6
B5	Perform Trade Math	7			0
C4	Use Oxy-Fuel Equipment	7			0
D1	Use Levelling Instruments and Equipment	7	PM-01 -PS02	Determine and transfer levels	6
D2	Use Site Layout Equipment	7	PM-01 -PS02	Determine and transfer levels	6
E2	Use Rigging and Hoisting Equipment	7			0

## Integrating Newcomers

British Columbia – BC PO		SA Curriculum NC(V)			
Competency		Rating	Practical skills / topics		Rating
F1	Layout Building Locations	7	PM-01 -PS02	Determine and transfer levels	6
F2	Prepare Building Site	7	PM-01 -PS02	Determine and transfer levels	6
G1	Use Concrete Types, Materials, Additives and Treatments	7			0
G2	Select Concrete Forming Systems	7			0
G7	Place and Finish Concrete	7			0
H1	Describe Wood Frame Construction	7			0
H2	Select Framing Materials	7	KT0801	Principles and procedures of procurement of different materials, tools and equipment types	6
H3	Build Floor Systems	7			0
H7	Build Specialized Framing Systems	7			0
H8	Perform Renovations and Additions	7			0
H9	Build Timber and Engineered Wood Construction	7			0
H10	Build Decks and Exterior Structures	7			0
I2	Install Doors and Hardware	7	PM-07- PS01	Install finishing components	6
I3	Install Windows and Hardware	7	PM-07- PS01	Install finishing components	6
I4	Install Exterior Finishes	7			0
I5	Install Interior Finishes	7	PM-07- PS01	Install finishing components	6
I6	Install Cabinets	7			0
J1	Control the Forces Acting on a Building	7			0
J2	Control Heat and Sound Transmission	7			0
J3	Control Air and Moisture Movement in Buildings	7			0

## Conclusions

### BC PO and NOA

The gaps we identified, especially those between the BC PO and the NOA could be due to structural differences between the two documents. Indeed, the BC PO states that it is aligned to the NOA.

## *Integrating Newcomers*

---

But we should nevertheless examine these gaps because challengers to the certification in BC have, in general, no trade schooling, and the NOA is the only training proxy we can use.

For example, we know that safety regulations and codes vary from jurisdiction to jurisdiction, and that only those Pan-Canadian regulations and codes might be tested on the Red Seal examination. A BC-specific gap is possible for those challengers who have worked mostly out of BC.

### **BC PO and NC(V)**

The gaps identified here are reflective of the differences in the training programs' structure. In effect, we are saying that someone who has been trained in a domain has the ability to recognize and adapt to changes to and in that domain. On the other hand, someone who was never exposed to the domain would be oblivious to its elements, hence would be insensitive to its subtleties, let alone to any change. We are also saying that it is easier to train someone familiar with a domain than someone with no acquaintance to that domain at all. And this is true regardless of the myth of having to "un-learn" things: there is no need to wipe the slate clean to learn new things.

The differences between safety legislation and regulations and building codes are significant, as are potential language differences – even if a South African student whose mother tongue is not English but took English as prescribed; the problem might be more acute for those students who did not take English at all (i.e. RPL graduates). But the South African carpenter has been well-trained in interpreting and applying these. Bridging gaps due to jurisdictional and language differences is a trivial finding, even if it is one that needs to be addressed.

The real gaps, those representing missing (or unmentioned) curriculum bits in South Africa, are, in decreasing order of importance: stick-framing whole buildings, concrete placing and oxy-acetylene torching, siting buildings, installing non-wood/wood composites exterior finishes, installing cabinetry, and the imperial system.

We also need to keep in mind that the 18 months' work experience allows NC(V) students – and maybe the other streams' students as well - to select one of 3 on-the-job specialties: forming, roofing, or finishing. That selection will be (most likely) exacerbated by the graduate's subsequent work experience – it is likely that a student electing "forming" will remain and work as a forming carpenter, hence be a less proficient finishing, or roofing carpenter.

## **Examination and Certification**

### **Credentialing in BC**

#### **Apprentices**

Apprentices are required to pass each of 4 levels (blocks) of in-school training. At the time of this writing, the practical and theory tests were institution-specific, but coordinated through a BC Articulation Committee for the trade. The Industry Training Authority (ITA) intends to impose standardized level theory tests starting in 2016. There is no standardized practical test: instructors assign cumulative marks for in-school projects (similar but not standardized).

Successful completion of the Level 4 in-school final exam gives access to the Red Seal examination, the only certification mechanism for carpenters in BC.

## *Integrating Newcomers*

---

### The Red Seal - Apprentices and challengers

#### *Introduction*

Apprentices and approved challengers are required to write the Red Seal examination in order to get a BC carpenter credential. There is no partial credit, no part credential.

The Red Seal examination is a timed “paper and pencil” test. All questions on the examination are machine-scorable multiple choice.

The Red Seal Certification examination is based on the National Occupational Analysis (NOA). The NOA is broken down into a numbers of blocks, tasks, and sub-tasks. Examination questions are based on the sub-tasks, the number of questions on each sub-task is based on a national mathematical average of estimated time spent on task by the carpenters in each jurisdiction, curved to the total number of question on the examination.

There is no weighting of any section of the Red Seal examination based on either heightened safety implications or criticality of task. There is no jurisdictional examination overlay for the Red Seal examination.

Red Seal examinations are prepared cooperatively between all Canadian jurisdictions but are hosted by a designated jurisdiction (designate status for any Red Seal examination is assigned through the CCDA<sup>16</sup>'s Product Committee's ISEC<sup>17</sup>). Red Seal examinations are item bank-generated; that is for each examinable sub-task of the NOA a number of items are developed and then randomly assigned to an instrument based on a ToS<sup>18</sup> that mirrors the NOA percentages.

Bank-generated examinations are more comprehensive and more “difficult<sup>19</sup>” than many of the “before-bank” examinations: items address more areas of the trade at more varied/complex levels than in one-off, instructor-developed examinations.

#### *Problems*

It is generally assumed that the ability to pass the examination<sup>20</sup> can be directly attributed to a candidate’s work experience: that there is a direct proportional relationship between the level, scope, and quality of on-the-job training (OJT) and experience, and performance on the examination. It is also assumed that the instructional content (and activities) delivered by the institutions reflect the National Occupational Analysis (NOA) - our analysis shows this to be a dubious assumption, at best.

There are a number of problems with these assumptions. First, it is questionable if a pencil and paper test can stand as a proxy for practical ability. Second, it is unclear whether the candidates are able, for the purpose of the test only, to conceptualize what they do in order to answer a “word” problem. Third, domain hierarchy is neither considered nor established. And fourth, the NOA sub-tasks are not worded clearly enough to permit domain definition (e.g. “G21.01 Removes existing materials”).

---

<sup>16</sup> Canadian Council of Directors of Apprenticeship

<sup>17</sup> The *Interprovincial Standards Examination Committee* is made up of provincial/territorial government representatives

<sup>18</sup> A *Table of Specifications* is developed by the host jurisdiction and assigns weights and taxonomic item levels to sub-tasks

<sup>19</sup> Where “difficulty” is a perceptual measure from the candidates’ perspective rather than statistically derived through Item Response or Classical theories

<sup>20</sup> 70% aggregate cut score for all Red Seal examinations

## *Integrating Newcomers*

---

The third and fourth problems are of interest to the carpenter Red Seal examination because they are borne out of examination development design and practice. As a pencil and paper test, the carpenter IP assumes that all candidates can read, thus making the examination a test of literacy. As well, many items require candidates to apply mathematical concepts in order to identify (not necessarily generate as they would on the job) the correct answer, as such, the Red Seal is a test of numeracy. These two domains are listed in the Essential Skills, but these are not tested for, nor are they part of the requirement for challengers, but they are tested in conjunction with the job skills. All Red Seal examinations are made up of items that test an indeterminate number of domains in an indeterminate fashion.

Success on the Red Seal examination means the candidate scored >70%. All Red Seal examinations have this unique cut score. The cut score is not adjusted to the compounded psychometric profile of the items used for the examination – items are not differentially weighted. And, while results are available at the task level, the score obtained is the unweighted ratio of correct answers over number of questions at the sub-task level.

### *Validity*

Validity is a measure of confidence in the inferences made based on a test score. With high stakes tests (like the Red Seal), it is crucial that test developers and administrators ensure inferences drawn from test scores are accurate. In the case of carpenters, a score <70% means that the candidate is not a competent carpenter, a serious professional issue.

Validation studies are recommended prior to the introduction of any test and should be mandatory for high stakes tests like the carpenter Red Seal. Usually three types of validation studies are conducted: content, criterion-related, and construct. With Red Seal examinations in general, only a cursory content validation is conducted when local experts review items.

Some may argue that the use of subject matter experts (SMEs) during item development is a validation exercise. This is a spurious argument, as content validation exercises ought to be conducted by independent judges, not the people who developed the items. Moreover, there is no indication that the SMEs are fully cognizant of all domains tested, are representative of the population of carpenters, or are able to precisely determine what is being tested.

### *Reliability*

If a test is an accurate measure of an individual's ability<sup>21</sup>, then any candidate's observed scores should be consistent over a number of tries on the same test or parallel, equated tests. Reliability indices are numerical values that provide a statistical measure of the consistency of test scores; one would expect z-scores of a given individual to remain relatively consistent over repeated tries.

Score consistency is affected both by random and systematic errors. Random errors are chance happening and cannot be controlled (but they can be accounted for). Systematic errors are due to either examination flaws or candidates' characteristic (e.g. visual impairment). Red Seal examinations are developed, produced, and implemented without any reliability studies. In fact, some jurisdictions do not track reliability indices, even rudimentary as or z-scores distributions in or for test-re-test situations.

---

<sup>21</sup> i.e. that E (the error unrelated to the domain(s) being tested – see footnote 2) is minimized in  $T=X+E$  so that the test score (X) is a stable, true reflection of the true score (T),

### **Credentialing in South Africa**

Whether a NC(V), apprentice, learnership, or RPL candidate, all South African carpenters-to-be face the same summative (and formative) tests. Access to these summative tests, their content, duration, and scoring are backstopped by SAQA and COTÖ's requirements, the central South African bodies for these educational matters. These summative tests are clearly differentiated in law from formative tests, i.e. tests required of learners for progress at school.

These summative tests are fixed in time (preparation for these varies based on the stream the student is in) and place. South African regulations stipulate who, where, when, and how candidates are to be examined and marked. All summative examinations require a student to pass exams and a battery of practical tests.

For carpenters, there are a minimum of six tests (more depending on the stream). At least one of these tests cover scholastic skills: mathematics, science, and English. Another test covers theoretical trade knowledge. The other 5-6 tests take place at an approved testing center, and cover hands-on trade skills selected from a set of "must-haves" listed in the curriculum.

All of these tests are cross-referenced to "end state" competences, and have a prescribed set of givens, conditions (e.g. time allotted, fixed number of pages, types of drawings, take-offs, etc.), and, for practical trade tests, at least one registered assessor.

The products of each test are gathered in a portfolio. Before granting the certification, the marks (and portfolios) are submitted to the appropriate NAMB who will recommend certification to QCTO.

The credentials are issued by QCTO.

### ***Validity***

The South African summative tests are "constructed response" tests. That is, and unlike the Red Seal, the candidate must generate his or her own answer or solution to a given problem. In addition, a South African candidate has to demonstrate both cognitive and hands-on abilities. Marks are issued by assessor(s), as opposed to being machine graded, and each assessment element builds an overall picture of the candidate across all terminal competences. The terminal competences are those the training program and the trade require as minimum proof of competence.

### ***Reliability***

Having many tests increase challenges to reliability if we added a reliability index for each test and summed those. One of the mechanisms the South African are relying on to increase individual tests' reliability is using multiple assessors across multiple instruments using standardized rubrics supplemented by a (at a minimum) two-tiered<sup>22</sup> marking structure – in effect getting (at least) two inter-rater values.

The South African picture is a composite one spread over six tests and it is unlikely that a candidate in a test-re-test situation would do much differently overall.

---

<sup>22</sup> There are usually 3 classes of requirements: knowledge, practical, and work-based (using a log book).

## *Integrating Newcomers*

---

### [BC vs. South Africa](#)

In Table 13 we compare the major elements of the testing and credentialing systems for carpenters in BC and in South Africa. Both systems reflect general beliefs and philosophy about education and training.

Briefly, BC, like most North American jurisdictions, consistent with a greater reliance on technology and quantitative, large scale standardized testing uses a machine scorable test. The Red Seal examinations are designed and produced by a broad-based Canadian consensus, and are managed by a local arms-length government agency, ITA, an institution removed from the training institutions and the field. The Red Seal endorsement is meant to qualify the worker.

By contrast, the South African approach is holistic – in the sense of gathering performance data from different cognitive, psycho-motor, and affective domains – and standards-based. The South African testing system reflects the ability to do things that are required in the world of work. It is meant to prove that the graduated student is an able, all-around artisan.

**Table 13.** Comparison of BC and South Africa examination and credentialing

Examination and certification		
Element	BC	South Africa
Exam	Single	Multiple
	Pencil & paper	Pencil & paper Hands-on
Domains tested	Multiple unspecified	Multiple specified
	Proxy	Direct
Domain inclusion	Negotiated norm	Criterion
Item type	Selected response	Constructed response
Scoring	Machine	Rubric-based
		Assessor (teams)
		2 tiered (NAMB & CQTO)
Scores	One correct	Gradated
Results	Unique fixed cut score	Compounded
Validity	Medium	Strong
Reliability	Unknown	Strong
Credential	Endorsement	National

## APPENDIX 1 - Evaluative framework

The following is a detailed rationale describing the process and product of the evaluative exercise.

### What is a rating scale?

A rating scale is a tool that allows an assessor to translate a candidate's achievement into a series of pre-set, defined values.

There are 4 major types of scales, arranged in the following fashion (Bond and Fox, 2007):

- Nominal scales – separate the data of interest in defined, recognizable classes, for example, there is an "A", a "B", a "C", ... a "n"
- Ordinal scales – separate nominal data along a quantitative axis, for example A>B>C>...n, therefore, e.g. A>n
- Interval scales – separate ordinal data along a regular quantitative axis, for example A>B>C>...n, such that (A-z)=B, (B-z)=C, (C-z)=D, ..., (m-z)=n, and z is invariant or constant but specific to the data (and scale) at hand (e.g. millimeters, cents, seconds, etc.)
- Ratio scales – separate interval data along a quantitative axis, for example A>B>C>...n, such that (A-z)=B, (B-z)=C, (C-z)=D, ..., (m-z)=n, and z is invariant or constant across all possible scales

For the purpose of analysis, the scale used is an interval numerical scale based on percentages. While the use of a percentage numerical scale is arbitrary, it is familiar to most people because it is closely aligned with scales used in the public education system. Unlike the public education in North America, we did not use a letter grades scale (i.e. A-F) with a percent range equivalency table (e.g. A = 85-100%). Using the percent scale will allow for both translation to any base 10 numerical scale (say a test based on 20 or 40 marks) and for uncertainty.

In addition, the number of ranks (10) provides evaluators some measure of sensitivity around mid-range performance (5-7).

### What is in a rating scale?

Rating scales are comprised of the following 3 elements:

- An ordinal rating value (e.g., 1, 2, 3, ... n); omitted here for the sake of simplicity
- A label defining the ordinal points (e.g., 1=10%, 2=20%, 3=40%, ... , 10=100%), i.e. an interval of 10% between each point
- One (or a set of) statement(s), or criterion/a, that describe(s) the behavior commensurate with the rating (e.g., 1=10% = "Candidate attempts to bluff through the task; or 'I have never done this type of task, but let me show you how it's done'"

For this exercise we have added another 2 sets of criteria or scales: safety and training. These 2 additional sets are more generic (have fewer details), and allow for evaluation as opposed to assessment. These scales are meant to be used simultaneously and conjunctively. There are 3 reasons for using additional rating criteria:

- Enable the assessor to classify the performance from a (gross) safety perspective (e.g., "Unacceptable", "High", etc.)

## *Integrating Newcomers*

---

- Enable the assessor to classify the performance at a more general level (e.g., “Needs in-school training”, “Needs on-the-job training”, etc.).
- “Triangulate” the performance rating. For example, we would not accept (and expect) that a candidate be rated competent and an unacceptable safety risk in the workplace simultaneously.

In addition, the 10-point scale is meant to assist users of the evaluation grid in better targeting their intervention(s), for example, on-the-job coaching vs. in-school training (or both).

### **What rating scales did we use?**

For this exercise, we used 3 rating scales and 1 set of statements or criteria. The rating scale elements are as follows:

- Safety
- Training required
- Percent scale (11 anchor points: N/A, 1-10)
- Criteria – description in the vernacular, from a certified tradesworker’s perspective of the expected level of comfort and/or familiarity and/or capabilities based on the training and testing attached to each competency.

### **Safety & Training scales**

The “Safety” scale is a 5-point scale risk qualitative estimate, color-coded for ease of reference (where risk is assumed to be linearly, inversely proportional to ability as reflected in the competency-based evaluation). The risk labels, while open to interpretation, are roughly aligned to investigators’ ratings when an accident involving a tradesworker occurs.

The Training Scale addresses 6 potential responses for each competency assessed, where 2 responses are hiring-based, 2 responses are training-based, and 2 responses are punctual (commensurate with mandated or legislated training):

**Table 14.** Color-coded safety and training scales

Risk	Training
Restriction	No training required at this time, <b>restrictions</b> are in place
Unacceptable	Training required is too extensive to justify hiring or restrictions are required
High	Training required is best delivered in a formal, in-school format (followed on-the-job training)
Medium	Training required is best delivered on-the-job (followed by training mandated for the job)
Low	No immediate training is required (except

## *Integrating Newcomers*

	that mandated for the job)
Improbable	No training is required (except that mandated for the job)

Note:

- “Restriction” refers to a job task limits imposed on the tradesworker by the hiring entity and kept in place until the tradesworker is deemed competent.

### *How did we integrate South African scales?*

The South African program consists of three articulated domains (using our translation): Activities and Tasks, Competences and competencies, and Technological knowledge. Only the first and the last of these levels have expected performance scales. Neither of these 2 scales are identical, although they are related – the same is true of the three levels listed just above.

The first scale is binary and separates the performance expectations between someone completing a task under supervision and using an assigned methodology, and someone completing a task independently using the methodology they have selected.

The second scale is a four-point scale that maps out fairly easily to the Interprovincial Standard Examination (IPSE, a.k.a. Red Seal) taxonomy or question classification, itself is a modified/compressed Bloom taxonomy. Roughly, the South African level 1 would correspond to the ability to name, member, recognize, or understand things and concepts. Level 2, in addition to Level 1, would correspond to the ability to apply concepts, perhaps mainly cognitively. Level 3 would correspond to the ability to analyze and apply the things and concepts cognitively and physically. And Level 4 would correspond to the ability to analyze complex tasks and create means to resolve them. These correspondences are captured in Table 7 below.

### *Combined numerical rating scale*

The numerical rating scale has 4 elements:

- Percent (%) rating (estimated) (10%, 20%, ... , 100%)
- Descriptors/criteria/vernacular
- Risk
- Training
- And, in addition, is cross-referenced to the South African performance levels

These elements are as follows:

**Table 15.** Combined scales

Score	Descriptor/vernacular	Risk	Training	South African cross-reference / IPSE/Bloom
N/A	Task is not required for the occupation or job position or headquarter	Restriction if task is part of the trade but location-specific	No training required at this time, restrictions are in place	
0 / 0%	Task is not part of profile; or “I have	Unacceptable	Training required is too extensive to	

## *Integrating Newcomers*

---

Score	Descriptor/vernacular	Risk	Training	South African cross-reference / IPSE/Bloom
	never done this type of work”		justify hiring or restrictions are required	
1 / 10%	Task is marginally part of profile; or “I have never done this type of task, but I think I can make it”	Unacceptable	Training required is too extensive to justify hiring or restrictions are required	
2 / 20%	Task is not part of profile but bears some resemblance to some profile task; “I don’t know this; show me and talk me through it step by step”	High	Training required is best delivered in a formal, in-school format (followed on-the-job training)	
3 / 30%	Task is not part of profile but is a composite of other tasks; “I’ve done this quite a while back, you just need talk me through it one step at a time”	High	Training required is best delivered in a formal, in-school format (followed on-the-job training)	
s4 / 40%	Task is part of profile but uncommon / rare; or “Here’s how the whole procedure is done, is that correct?”	High	Training required is best delivered in a formal, in-school format (followed on-the-job training)	Technological knowledge <sup>23</sup> – Information level IPSE Tax 1; Bloom 1-2
5 / 50%	Task is part of profile but usually left to specialists; or “I can do this, but I’ll probably get stumped and may need help at some point”	Medium	Training required is best delivered on-the-job (followed by training mandated for the job)	Technological knowledge – Expression level IPSE Tax 1→2; Bloom 2→3
6 / 60%	Task is part of profile but usually left to	Medium	Training required is best delivered	Activities and Tasks – Supervised

---

<sup>23</sup> Our translation – Les savoirs technologiques associés; Niveau d’information; Niveau d’expression; Niveau de la maîtrise d’outils; Niveau de la maîtrise méthodologique

## Integrating Newcomers

---

Score	Descriptor/vernacular	Risk	Training	South African cross-reference / IPSE/Bloom
	specialists; or “I can do it on my own, you just need to check when I’m done – I’ll probably make a forgivable mistake”		on-the-job (followed by training mandated for the job)	and following an assigned method <sup>24</sup> Technological knowledge – Tool mastery level IPSE Tax 2; Bloom 3-4
7 / 70%	Task is part of profile but frequency of practice varies a lot; or “I can do it on my own, you just need to check when I’m done – I won’t make any mistake”	Low	No immediate training is required (except that mandated for the job)	Activities and Tasks – Supervised and following an assigned method Technological knowledge – Tool mastery level IPSE Tax 2; Bloom 3-4
8 / 80%	Task is part of profile and is very common; or “I can do it on my own, you won’t have to check my work”	Low	No immediate training is required (except that mandated for the job)	Activities and Tasks – Proficient and chooses method <sup>25</sup> Technological knowledge – Methodological mastery level IPSE Tax 3; Bloom 5-6
9 / 90%	Task is part of profile and tested rigorously; or “I can teach others how to do it”	Improbable	No training is required (except that mandated for the job)	Activities and Tasks – Proficient and chooses method Technological knowledge – Methodological mastery level IPSE Tax 3; Bloom 5-6
10 / 100%	Task is part of profile and subject to re-certification; or “I developed and implemented this procedure”	Improbable	No training is required (except that mandated for the job)	

Notes:

---

<sup>24</sup> Our translation – Activités et tâches : sous contrôle / sous la responsabilité d’un supérieur hiérarchique / méthode imposée

<sup>25</sup> Our translation – Activités et tâches : maîtrise l’exécution ... et peut en choisir la méthode d’exécution

## *Integrating Newcomers*

---

- The numerical standard for an estimated “competent” performance rating is 70%, or the ability to perform safely independently. An estimated “proficient” performance rating is 90% or 100% or that exhibited by a higher level of certification or tenure as a trades instructor.
- Where “forgivable” in the 60% rating vernacular means a procedural misstep or omission; an error that would not have led to or resulted in injury to self, co-workers, or the public and/or damage to equipment or plant.

### **Further refinements**

The analysis conducted herein could be further refined by adding analytical levels, say including learning tasks, or “saviors”, or “limites de connaissance”. Using these levels, it might be possible to move from an ordinal rating to an absolute rating and then conduct mathematical operations on the ratings and add weightings to calculate gaps to a higher – albeit artificial - level. This is explained below.

The numerical indicators above can be handled via arithmetic mean calculations – if they are used in an absolute fashion rather than a comparative or ordinal fashion - and would have the following assumptions embedded:

- All ranks are equally spaced, i.e. it is as difficult to go from a “20%” to a “30%” as it is from a “60%” to a “70%”.
- Competence and risk can be represented linearly (in the form of  $y=ax+b$ )
- All competencies are equally important
- All competencies are equally risky
- There is no measurable skills erosion due to jobsite conditions or time elapsed since certification

Clearly, all of these assumptions might lead to (i) overestimation of competence and, (ii) underestimation of risk. For example, in a worst case scenario, a tradesworker may “score” very high on low risk/low impact competencies, hence “make up” for weaknesses in high risk/high impact competencies.

There are 2 non-mutually exclusive palliatives to address the assumptions’ potential impact on gaps/scores:

1. Gating items/competencies

Simply put, gating items or competencies are “must-haves”. For example, a carpenter who lacks, e.g., NOA Book C Task 8 “Constructs Formwork”, would be considered “incompetent” altogether as mastery of that Task is deemed absolutely necessary to function in a Canadian construction environment.

2. Weighting

Weighting consist in assigning a multiplier to the assessed raw score based on competency criticality and/or risk level (expressed as a “safety score”). At the individual competency level achievement described as a percentage remains the same, but at the aggregate level, the weighting affects the results. Weighting values could be based, say, on percent of instructional time listed in the BCPO, or the Tasks national averages in the NOA.

## Integrating Newcomers

---

**Table 16.** Example of profile results using the all of the ratings to determine a risk factor on a 3-point scale  
(weighted risk factors were not considered)

Summary of ratings against competencies		Score/Max.	Percent	Risk/Training	Value (=v)	Average Risk (=Σv/n)
3 greens (all at 7/70%)		21/30	70%	Low	3*1=3	2.17
4 yellows (3 at 6/60%, 1 at 5/50%)		23/40	58%	Medium	4*2=8	
5 oranges (4 at 4/40%, 1 at 3/30%)		17/50	34%	High	5*3=15	
Overall		61/120	51%	Medium-High	26/12	Medium-High

Comparing 2 “candidates” with similar rating profiles but in a weighted situation:

**Table 17.** Example of weighted program comparison

GAC	(K) Raw Score		(K) No weight %		Weight (1-5)	(K) Weighted score		(K) Weighted %		(S) Raw Score (SRS)	(S) No weight		Weight (1-5) (W)	(S) Weighted score		(S) Weighted %		
Candidate	A	B	A	B		A	B	A	B	A	B	A	B	A	B	A	B	
<b>A</b>	P	P	P	P	∞	P	P	P	P	P	P	P	∞	P	P	P	P	
<b>B</b>	6	7	60%	70%	4	24	28	60%	70%	2	1	55%	75%	4	8	4	.50	.25
<b>C</b>	4	6	40%	60%	4	16	24	40%	60%	3	2	30%	55%	4	12	8	.75	.50
<b>D</b>	6	5	60%	50%	2	12	10	60%	50%	2	3	55%	30%	2	4	6	.25	.38
<b>E</b>	9	7	90%	70%	1	9	7	90%	70%	0	1	95%	75%	1	0	1	0	.06
<b>Overall</b>	25	25	63%	63%		61	69	55%	63%	7	7	59%	59%		24	19	1.50	1.19
																	67%	83%

Note: (S) Weighted % is calculated as: 
$$\left\{ 100 \left( \frac{1}{\frac{(SRS \cdot W)}{(W \cdot SRS_{max})}} \right) \right\}$$

## APPENDIX 2 - Glossary of Terms

Below is a list of terms used throughout the report, cross-referenced to their South African term(s).

**Table 18.** Glossary of terms

Element	South African	Explanation
Assessment	Évaluation scolaire	<ul style="list-style-type: none"> <li>The term assessment is generally used to refer to all activities teachers use to help students learn and to gauge student progress.</li> </ul>
Certified/Certification	Qualifié ou diplômé / Certification en tant que ...	<ul style="list-style-type: none"> <li>Certification refers to the confirmation of certain characteristics of an object, person, or organization. This confirmation is often, but not always, provided by some form of external review, education, assessment, or audit.</li> <li>One of the most common types of certification in modern society is professional certification, where a person is certified as being able to competently complete a job or task, usually by the passing of an examination.</li> <li>There are two general types of professional certification: some are valid for a lifetime, once the exam is passed. Others have to be recertified again after a certain period of time. Also, certifications can differ within a profession by the level or specific area of expertise they refer to.</li> </ul>
Competence	Aptitude	<ul style="list-style-type: none"> <li>Competence is a generic term used to describe an acceptable performance in the appropriate context; it is the ability to do a particular activity to a prescribed standard.</li> <li>Competence is measured against (a set of) documented criteria.</li> <li>Competence usually regroups a number of activities or behaviors typical of a job but may not include all job tasks.</li> </ul>
Competence (General Area of)	Activité(s)	<ul style="list-style-type: none"> <li>General Area of Competence (GAC) are made up of competencies following this rough classification: <ul style="list-style-type: none"> <li>Competencies related to specific divisions in work assignment or job activities.</li> <li>Competencies that comprise knowledge, skills, and abilities (KSAs) used extensively as part of one or more job activities.</li> <li>Competencies that relate to a generic set of learning activities.</li> </ul> </li> </ul>
Competency	Tâche / Savoir-faire / Compétence	<ul style="list-style-type: none"> <li>Competency and competencies are concepts used to label particular abilities and refer to</li> </ul>

## *Integrating Newcomers*

---

		<p>activities.</p> <ul style="list-style-type: none"> <li>• Competency statements always contain a verb that describes what the person does.</li> <li>• For operational purposes, competencies:           <ul style="list-style-type: none"> <li>◦ Taken together, fully describe the general area of competence (GAC) they are a part of.</li> <li>◦ Are constituent parts of general areas of competence.</li> <li>◦ Fully describe an independent job unit.</li> <li>◦ Describe what the individual is able to do.</li> <li>◦ Include each and every job skill; fully describe the job in behavioral terms.</li> </ul> </li> </ul>
Competency (Profile Chart)	Activités et taches professionnelles	<ul style="list-style-type: none"> <li>• A Competency Profile Chart outlines all competencies that a worker, tradesperson, and (therefore) an apprentice, is expected to perform on the job. It forms the basis for developing a training program.</li> </ul>
Content - Program outline	Abrégé du programme pédagogique	<ul style="list-style-type: none"> <li>• A list of topics required for each learning task.</li> </ul>
Content - Materials	Ressources pédagogiques / Matériel didactique	<ul style="list-style-type: none"> <li>• A comprehensive package (in any medium) of information required to support the delivery of learning tasks.</li> </ul>
Course	Cours	<ul style="list-style-type: none"> <li>• [Is] a short, pithy statement which informs a student about the subject matter, approach, breadth, and applicability of the course [material].</li> <li>• Focuses on content ... we are looking for a list of topics<sup>26</sup>.</li> <li>• There is no standard definition of the word course in UK higher education ... the definition of a course is usually driven by the academic regulations and structures of a provider.</li> <li>• A course [is] a coherent academic engagement with a defined set of learning outcomes.</li> <li>• [A] course [is] something you can apply to.</li> <li>• A course [is] the thing that leads to the student's qualification<sup>27</sup>.</li> </ul>
Curriculum (also see syllabus, program)	Programme scolaire / de formation	<ul style="list-style-type: none"> <li>• In formal education, a curriculum is the set of courses, and their content, offered at a school or university. A curriculum is prescriptive, and is based on a more general syllabus which merely specifies what topics must be understood and to what level to achieve a particular grade or standard.</li> <li>• May also refer to a defined and prescribed</li> </ul>

---

<sup>26</sup> Stanford University the Office of the Registrar

<sup>27</sup> Higher Education Statistics Agency (UK)

## *Integrating Newcomers*

---

		course of studies, which students must fulfill in order to pass a certain level of education.
Delivery - Instructor	Enseignement – Instructeur / Formateur	<ul style="list-style-type: none"> <li>• Individual tasked with teaching apprentices or aspiring workers.</li> </ul>
Evaluation	Évaluation	<ul style="list-style-type: none"> <li>• Evaluation is making a judgement (or set of judgements) on how well a (training) program has reached its stated objectives. Summative evaluation (hereinafter referred to as “evaluation”) is the last and concluding step in the DACUM process and the ADDIE training and instructional development models.</li> <li>• The results of evaluation exercises allow us to determine: <ul style="list-style-type: none"> <li>○ The type of contribution the (training) program made to the organization.</li> <li>○ Participants’ reaction to elements of the (training) program.</li> <li>○ Participants’ grasp of the (training) program contents.</li> <li>○ Participants’ success in applying newly learned concepts and behaviors on the job.</li> <li>○ The (training) program’s cost-effectiveness.</li> <li>○ How the (training) program might be improved.</li> <li>○ Whether or not the (training) program should be repeated or modified before repeat deliveries.</li> </ul> </li> </ul>
Exam – Competence evaluation	Évaluation des aptitudes / du savoir-faire	<ul style="list-style-type: none"> <li>• Competence evaluation is a test of practical competence. Competence is defined as ‘the ability to do a particular activity to a prescribed standard’. Competence is based on the belief that what people do rather than what they know is most important in terms of job safety, (training) outcomes, and productivity. Competence is measured against specific job competencies.</li> <li>• A Competence evaluation is trade / occupation-specific. Competence evaluations focus on “core competencies” for the trade / occupation. Those core competencies are identified by subject matter experts (SMEs); core competencies are defined as work activities that are critical to safety and / or extremely common.</li> </ul>
Exam - Exam	Examen	<ul style="list-style-type: none"> <li>• An exam(ination) or test is an assessment intended to measure a candidate’s knowledge, skill, aptitude, physical fitness, or ability. An exam or test may be administered orally, on paper, on a computer, or in a confined area that requires a test taker to</li> </ul>

## *Integrating Newcomers*

---

		physically perform a set of skills. Formal examinations or tests often yield grades or test scores.
Exam - Quiz	Test	<ul style="list-style-type: none"> <li>• A quiz is a brief assessment used in education and similar fields to measure growth in knowledge, abilities, and/or skills.</li> <li>• Quizzes are usually scored in points.</li> </ul>
Exam – Skills Check	Examen des savoir-faire	<ul style="list-style-type: none"> <li>• See “Competence Evaluation” above</li> <li>• The results of a Competence evaluation allow us to determine: <ul style="list-style-type: none"> <li>○ The skills level of the candidate against core job competencies.</li> <li>○ The training required to fill the skills gaps, if any.</li> <li>○ The most appropriate training mode to fill the skills gaps.</li> </ul> </li> </ul>
KASA - Ability	Capacité	<ul style="list-style-type: none"> <li>• The power or capacity to perform an activity or task<sup>28</sup></li> <li>• An internal / self- (or external) evaluation of an individual’s affective, cognitive, and psycho-motor domains’ capacities (sometimes partially captured via qualifications) that allow for the placement of that individual on an idiosyncratic ordinal scale.</li> </ul>
KASA - Attitude	Attitude	<ul style="list-style-type: none"> <li>• A state of mind or feeling with regard to some matter.</li> <li>• Affective domain activities such as training or end-of-course-evaluations, and so on, would tap “attitudes”.</li> </ul>
KASA - Knowledge	Connaissance(s) - Savoir(s)	<ul style="list-style-type: none"> <li>• An organized body of information, usually factual or procedural in nature.</li> <li>• Cognitive domain activities such as training, end-of-course-evaluations, and so on would tap “knowledge”.</li> <li>• As opposed to competencies, knowledge statements do not contain “action” verbs. Rather they state what the content or facts might be.</li> </ul>
KASA - Skill	Habileté	<ul style="list-style-type: none"> <li>• “Skill” is taken to be primarily to be “the ability to carry out [a] particular task” or “the proficient manual, verbal, or mental manipulation of data or things”.</li> <li>• Rather than “ability based on some permutation of dexterity, practical knowledge, theoretical knowledge and social ability”, or “the ability or potential ability to</li> </ul>

---

<sup>28</sup> <http://www.va.gov/jobs/hiring/apply/ksa.asp>

## *Integrating Newcomers*

		fulfill all the tasks associated with or negotiated for an occupation” <sup>29</sup> .
Learning outcome	Aboutissement de l'apprentissage	<ul style="list-style-type: none"> <li>A statement of what a learner will be able to do as a consequence of attending a course, studying materials, using a job aid, etc.</li> <li>Also referred to as “Learning Objective”.</li> </ul>
Learning task	Attente(s) d'apprentissage	<ul style="list-style-type: none"> <li>One of a set of instructional activities which, collectively, are required in order to reach one of a competency’s enabling objective, or the competency’s learning or performance outcome.</li> </ul>
Needs Assessment	Évaluation des besoins	<ul style="list-style-type: none"> <li>A needs assessment is a systematic effort to gather data, ideas, and opinions from a variety of sources about performance problems, or new systems/procedures, or new technologies’ impact on workers.</li> <li>A need is a gap between the current situation (actuals) and a more desirable future situation (optimals). A need only exists when there is a discrepancy or gap between actuals and optimals. A training need is training required to fill that gap.</li> <li><b>Note</b> that training may not be that appropriate response to any given gap.</li> </ul>
Performance outcome	Résultat(s) prévus	<ul style="list-style-type: none"> <li>A statement describing the learner’s observable, measurable behavior resulting from attending a course, studying materials, using a job aid, etc.</li> <li>Also referred to as “Instructional/Performance Objective”.</li> </ul>
Qualification	Qualification	<ul style="list-style-type: none"> <li>Qualification refers to documentary evidence (in the form of certificates, guild membership, proof of training, on-the-job experience, etc.) that shows the bearer is recognized as a practitioner in the field for which the qualification has been issued.</li> <li>“Certification” is often used as a synonym.</li> </ul>
Qualified	Qualifié	<ul style="list-style-type: none"> <li>A bearer of (a) qualification(s) is said to be qualified.</li> <li>Some will argue that one may be certified (i.e. be the bearer of a qualification or certificate) but not qualified. In that instance, “qualified” refers to the (evaluated) ability to “do the job” regardless of documentary evidence in hand.</li> </ul>
Qualitative (e.g. assessment, evaluation, research, etc.)	Approche qualitative	<ul style="list-style-type: none"> <li>Reported outcomes of investigations in the physical or social realms that eschew any numerical representation (or, at most, report</li> </ul>

<sup>29</sup> Winch C, and Clarke, L (2003); “Front-loaded” Vocational Education versus Lifelong Learning. A Critique of Current UK Government Policy, Oxford Review of Education, 29:2, 239-252

## Integrating Newcomers

---

		<p>rudimentary frequencies/counts) or mathematical (usually statistical) manipulation. Often used as a counterpoint to “quantitative” (aka “hard”), “qualitative” outcomes report on attributes of interest using the vernacular (although with post-moderns, there has been a marked increase in the use of obscure language).</p> <ul style="list-style-type: none"> <li>• There is a connection between the qualitative and the quantitative via the theory of measurement: “The objects measured, their properties and the relationships between them are described as <i>qualitative</i>, to distinguish them from numbers and numerical relationships, which are described as <i>quantitative</i> ... Such qualitative structure, however, may be similar (i.e. isomorphic or homomorphic) to quantitative (numerical) structures. It is in virtue of this structural similarity that numerical systems may be used to <i>represent</i> qualitative empirical systems.<sup>30</sup>”</li> </ul>
Quantitative (e.g. assessment, evaluation, research, etc.)	Approche quantitative	<ul style="list-style-type: none"> <li>• Commonly thought to be the assignment of numbers (real, rational, and irrational) to a process, product, result, or any outcome of an investigation in physical or social realms. This assignment of numbers to outcomes is taken as a confirmation that some sort of attribute has been measured. While commonly understood to follow Steven’s (1946) nominalist-representational formulation: “a measurement is the assignment of numerals to objects or events according to a rule<sup>31</sup>”, the concept of measurement as an arbitrary, investigator-based assignment of a scale is erroneous.</li> <li>• “Put as succinctly as possible, <i>measurement</i> is the <b>numerical estimation of the ratio of a magnitude of a quantitative attribute to a unit of the same attribute.</b>”</li> <li>• “<i>Quantitative attribute.</i> A quantitative attribute (or quantity) is an attribute the instances of which are related to one another both ordinally and additively. One version of (continuous) quantitative structure is given by Hölder’s (1901) axioms<sup>1</sup> ... Not all</li> </ul>

---

<sup>30</sup> Michell, J (1993): The Origins of the Representational Theory of Measurement: Helmholtz, Hölder, and Russell, *Studies in History and Philosophy of Science* 24 (2), 185-206 (emphasis in original)

<sup>31</sup> Stevens, S.S. (1946): On the theory of the scales of measurement. *Science*, 103, 667-680

## *Integrating Newcomers*

---

		attributes are quantitative. E.g. length is quantitative, but neither sex nor nationality is. <sup>32</sup> "
Training	Formation	<ul style="list-style-type: none"><li>• A planned, systematic set of mediated activities which results in a predicted, (mainly) permanent behavior change in the participants and is (i) a response to a documented knowledge or skill-based performance gap, and (ii) job-specific, location-specific, or firm-specific.</li></ul>

---

<sup>32</sup> Both quotes from Michell, J (1997): Quantitative science and the definition of *measurement* in psychology. *British Journal of Psychology*, 88, 355-383 (emphasis in original)

## APPENDIX 3 – Select Web References

Accessed 19 - 24 March 2016

<http://www.collegesa.co.za/what-is-a-tvet-college.html>

<http://www.tasagauteng.co.za/the-nature-of-artisan-development-in-south-africa-tooling>

<http://www.sol-tech.co.za/wp-content/uploads/2009/09/Article-26D-trade-certificate.pdf>

<http://southafricapage.com/learnerships-for-2016/>

<http://www.ceta.org.za/registered-qualifications/>

<http://nadsc.dhet.gov.za/site/NAMB.aspx>

<http://www.fetcolleges.co.za/>

<http://africaskills.co.za/trade-test-centre/>

<http://www.qcto.org.za/index.php/registered-qualifications>

<http://www.labourguide.co.za/health-and-safety>

<http://www.dhet.gov.za/DHET%20Statistics%20Publication/Statistics%20on%20Post-School%20Education%20and%20Training%20in%20South%20Africa%202012.pdf>

<http://www.bibc.co.za/news/Collective%20Agreement%201%20November%202010.pdf>

<http://www.goenterprise.co.za/index.php/q-a-a/what-is-a-seta/29-ceta>

Statistics Canada

<http://www.statcan.gc.ca/pub/81-004-x/2010002/article/11253-eng.htm>

Accessed 26 November 2015

Statistics Canada

<http://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=3154&lang=en&db=imdb&adm=8&dis=2>

Accessed 26 November 2015

---

<sup>i</sup> Hölder's axioms (1901) are as follows (from Michell, J (1993): The Origins of the Representational Theory of Measurement: Helmholtz, Hölder, and Russell, *Studies in History and Philosophy of Science* 24 (2), 185-206:

1. Given any two magnitudes,  $a$  and  $b$ , of the same kind, *one and only one* of the following is true
  - (i)  $a$  is identical with  $b$  (i.e.  $a=b$  and  $b=a$ ).
  - (ii)  $a$  is greater than  $b$  and  $b$  is less than  $a$  (i.e.  $a>b$  and  $b<a$ ).
  - (iii)  $b$  is greater than  $a$  and  $a$  is less than  $b$  (i.e.  $b>a$  and  $a<b$ ).
2. For every magnitude there exists one that is less.
3. Any two magnitudes of the same kind,  $a$  and  $b$ , when added in a definite order give a well determined sum,  $a+b$
4. For any two magnitudes of the same kind,  $a$  and  $b$ ,  $a+b>a$  and  $a+b>b$ .

5. If for any two magnitudes,  $a$  and  $b$ , of the same kind,  $a < b$  then there exists magnitudes  $x$  and  $y$  also of that kind such that  $a+x=b$  and  $y+a=b$ .
6. For any three magnitudes,  $a$ ,  $b$ , and  $c$ , of the same kind  $a+(b+c)=(a+b)+c$ .
7. If all magnitudes of the same kind are divided into two classes such that
  - (i) each magnitude belongs exactly to one class, and
  - (ii) each magnitude of the first class is smaller than any magnitude of the second class, then there exists a magnitude,  $m$ , such that every magnitude  $m' < m$  belongs to the first class and every magnitude  $m'' > m$  belongs to the second class ( $m$  may belong to either, depending upon the case)