

Integrated Assessment – How it Works

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1. Introduction

The New Zealand Qualifications Framework system has been around since 1990. In that period of time a lot of changes have taken place including the expansion of the original 8 level framework to a 10 level framework to encompass the inclusion of both the senior secondary school system and the university system. After initial teething problems and resistance from the traditional learning institutions, the system has settled down and in general works very well.

One of the major challenges for workplace assessment has been how to ensure that assessment integrates underpinning knowledge and skills with application. There has been a trend in the last couple of years in the development of unit standards and qualifications for knowledge and practice to be split out. This has come about because employers found that they did not have the knowledge and skills to address the learning requirements for teaching underpinning knowledge. It was also not their main focus as it often conflicted with the need to make a profit and have workers out there 'earning a living'.

In this paper I will look at:

- the concepts of capability and competence
- methods traditionally used to assess both concepts
- how transfer of learning is used to integrate both concepts
- a case study from the Joinery Industry that highlights how these concepts have worked in practice.

2. Background

New Zealand, like others countries, has struggled in past years with a skills shortage and low unemployment. This has meant that students coming out of school have had the opportunity to pick and choose jobs that they wish to do and how much they have actually learnt in school has not been too much of a problem. Unfortunately this has masked an underlying literacy and numeracy problem which is often not picked up until formal workplace assessment is undertaken.

New Zealand was a participant country in the International Adult Literacy Survey, and the survey revealed that literacy levels in the population were poorly equipped to meet the higher level demands of the changing workplace. The New Zealand Adult Literacy strategy '*More than words*' presented literacy as crucial to economic transformation in New Zealand. The recent '*Literacy Language and Numeracy Action Plan 2008-2012*' reported that 43% of working age adults have literacy skills below those needed to 'participate fully' in the knowledge society. While these findings pose a problem for society in general, they pose a specific problem for companies who are involved in on-job training and assessment. New workers may

learn the skills to complete a specific set of tasks but they often have a poor grasp of the underpinning knowledge to fully understand the task.

3. Defining Competence

For workplace training and assessment to be successful there needs to be a clear understanding on the part of all the stakeholders of what is required. This includes the worker, the employer, and the standard setting body who is representing the industries requirements for specific knowledge, skills and attitudes. To ensure a national system works all the stakeholders need to have confidence in the end product. This means being clear on what is meant by competence.

In most countries there is agreement that competence relates to performance in the workplace. However there is varying levels of agreement about what this actually means. In most countries in Europe, competence is related to individual capacity in relation to a comprehensively defined notion of occupation, built upon a broad knowledge and skills base, and encompassing a wide range of occupational, social and personal qualities. This notion of competence assumes the worker is an autonomous individual able to take decisions independently and to solve tasks in unpredictable situations. The notion of competence development is crucial and relies on the worker's ability to integrate theoretical knowledge reflectively into work practice, thereby producing new knowledge and creating scope for innovative practice. While this is a wonderful ideal, in most cases it does not happen in practice. For the bulk of workers undergoing workplace training and assessment skill acquisition happens through carrying out the tasks in the job on a regular basis. Gaining theoretical knowledge is a different issue and in some cases never happens.

In New Zealand we have now defined the two areas of skill and knowledge acquisition separately.

Competence – the assessment of consistent performance in a context (workplace).
Capability – the assessment of underpinning knowledge and skills.

The unit standards define the specific competences – the knowledge, skills and attitudes or behaviours required to complete a specific outcome. These could be knowledge based or practical based and both make up the specific packages or programmes that are our qualifications.

What we have learnt is that ultimately competence is achieved through comprehensive programmes which comprise both general education and occupational components. In this integrated approach knowledge and skills are components of individual competences and combine with social and personal qualities in dealing with a given work situation. This approach only works when the programmes are linked to a National Qualifications Framework that uses level descriptors to provide a benchmark across occupations and learning situations. A national qualifications framework is a systematic description of an education system's qualifications, where all learning achievements are measured and related to each other.

Defining what competence means is only one part of the story. It's also important to look at how assessment measures that process.

4. Assessment

Assessment processes have matured as the New Zealand system has had greater uptake resulting in a more critical examination of how assessment takes place. Our system has an auditing function built in called moderation. All assessing bodies whether workplaces, training providers or schools are required to participate in an annual moderation process that samples assessments to check for fairness and consistency against the national standards. This is linked to a quality assurance process that looks at the fitness for purpose of the standards, assessment methods and the ability of training providers to deliver and assess against national standards.

One of the consistent issues that have arisen out of the assessment process is how the learning inputs are being achieved. The issue is not so problematic with practical assessments. Practical assessments are often carried out in the workplace after the employer and the worker deem the worker is ready to be assessed. Assessment traditionally takes place by observation of work practice, examination of completed products, or examination of supporting documentation. Evidence is often collected over all three areas and along with some sort of knowledge testing is then assessed to determine whether the worker is competent or not yet competent. This method of assessment is ideally suited to the workplace as it relies mainly on naturally occurring evidence of what is carried out in the job everyday and reflects what a worker 'can do'.

Assessment of capability is often another matter. As outlined in the introduction, assessment of knowledge is not something employers or workplace assessors are necessarily skilled at. The problem in this area is not just one of assessment but one of training. In the workplace how does a worker gain the necessary underpinning knowledge related to what they do? While a worker will pick up skills from working alongside an experienced worker they will not acquire knowledge in this way. Knowledge needs to be learned. For most employers this is a problem as they are not educators but business people skilled in their particular area of expertise. In New Zealand this issue has been further complicated by the low literacy and numeracy levels now found in some occupations. All of this has resulted in employers moving away from dealing with the capability requirements to a focus on competence training and assessment instead.

For the standard setting bodies, who are responsible for ensuring the development and assessment of their respective industries national standards, this poses quite a large problem. To ensure both competence and capability are trained and assessed they are having to work through issues of how to successfully integrate workplace and training provider training and assessment in a way that meets all the stakeholders requirements. Traditionally off-job training has been achieved by full-time or part-time training in a training provider or self-paced distance learning. Learners could either complete the training before they were employed, as pre-employment training, or while they were employed by attending block courses or

completing assignments. Assessment of the knowledge was traditionally done by the training provider who supplied the training.

Attending off-job training for workers who are employed can also raise issues for their employers. New Zealand is mainly made up of small to medium enterprises which can ill afford to have their workers away for any length of time. This means that any block course training has to be kept to one to two weeks which often doesn't allow the training provider enough time to do justice to the learning that is required. Workers who are assessed as not yet competent are often not given time to 'have another go' resulting in practical skills being gained but not the underpinning knowledge. Any workers with learning difficulties are often disadvantaged before they start and never end up completing the knowledge requirements. While this may not be so much of a problem when there is full employment in a tighter economic climate it could result in unemployment.

Getting workers to complete their knowledge requirements by self-paced distance learning can also be problematic. The obvious problems arise if a worker is not very literate and has trouble with reading and writing. There are also hidden literacy competencies in distance learning that need to be considered. Learners must know how to estimate the amount of time each module will take and plan a calendar of work to ensure completion. They need to be able to search for information not provided in the modules or by people they work with. They will need information searching skills which could include how to use a library or the internet. They also need to know how to present and submit assessments. Most of all they need attitudinal skills relating to motivation, time management and commitment. This does not often go hand in hand with the age stage of most new workers!

5. Transfer of Learning

In order for learners to be able to integrate their off-job and on-job learning there has to be a clear understanding by all stakeholders of how this process works and what support mechanisms are necessary to make it successful.

What is transfer of learning? Transfer is considered to be the effective and efficient application into a new context, of skills and/or knowledge obtained and/or used in another context. Until recently it has been widely assumed that transfer, if not automatic, was at least relatively easy. Contemporary research and best practice indicate that this is in fact not so. Transfer involves a set of skills that need to be learned and practiced, like all skills. Transfer skills include meta-cognitive skills, linked to reflective self assessment of performance in differing contexts.

This concept of transfer expects a learner to possess a distinct set of skills which include:

- The ability to understand the relationship between the demands of past performance and the performance demanded in the new task/situation.
- The ability to make the link between past tasks/situations in which they were competent and the new task/situation and whether their existing skills/knowledge can be used to good effect and/or whether new learning is required.

- The ability to analyse why they want to make the change (motivation, incentives, disincentives, etc.).

These are quite sophisticated skills and would be beyond the scope of most new workers without assistance. Current research on learning and innovation seems to suggest that making knowledge explicit in a formal learning context can be made more effective by linking it to informal learning activities in the workplace. This could include watching experienced tradespeople, working with experienced tradespeople, practicing without supervision and searching independently for information. This informal learning would need to reflect what has been taught in the formal learning context and where the concept of integrated programmes of learning and assessment become all important.

The other aspect that needs to be taken into account when considering integrated programmes for new workers is the actual individual themselves. Each person comes to work with unique life and work experiences which impact upon their level of confidence and influence their approach to work and learning. They bring a degree of 'cultural capital' with them which means any advantages they may have in terms of understanding how things are done in a local environment such as a workplace or community. An example of this would be if they are entering a trade that one of their parents or wider family members currently occupies.

Extensive research has indicated that transfer/adaptability is facilitated by some particular teaching and learning strategies and not by others. The more effective learning strategies include:

- Using a wide range of contexts in which skills and knowledge are acquired and practiced.
- Using inductive rather than deductive processes e.g. examples followed by theory then practice, rather than just theory followed by practice.
- Integrated problem based learning contexts.
- Encouragement of self-directed learning and self-reflection on learning styles.

The factors outlined above provide a strong message that transfer of learning using integrated programmes of learning and assessment have to be carefully managed.

How is this best done? Both capability and competence learning needs to be formally linked. Formal learning of knowledge in an off-job context needs to underpin and reinforce the less formal learning that takes place in the on-job context. These links need to be made explicit to the learner so that they understand how the two systems integrate. This could be by providing information to the off-job tutor about the workplace experiences the new worker has already undergone prior to them attending the off-job learning and some background information about the person's 'cultural capital' they bring to the job. The off-job tutor then responds by providing information to the on-job supervisor of what the new worker has achieved in their off-job learning and the progress they have made to date. So often these simple communication processes are not put in place.

How do we know transfer has taken place? Research has shown that context variations lie at the heart of transfer/adaptability. The most effective assessments

are those that are dense with real life information. These 'dense' items require a candidate to understand:

- how to handle the information
- extract the required information
- turn the problem into one which can be tackled
- work on the problem
- then turn the solution into a real world solution.

This type of assessment requires multiple assessment and fits very well with the New Zealand 'best practice in assessment model' which uses a collection of evidence model of assessment. Multiple assessment occasions are vital for managed assessment of transfer.

This research supports the argument that there is a need for educators, in the broadest sense of the word, to have the skills, knowledge and techniques to assist candidates to utilize the skills involved in transfer while acquiring their underpinning knowledge and skills.

The third part of the transfer triangle that needs to be considered is the mentor/supervisor who works with the candidate when they are attempting to transfer/adapt their underpinning knowledge and skills (capability) to competence in a particular situation. The contexts in which competence is developed affect/condition the extent to which individuals are able to adapt to new contexts and demands.

While the candidate may have learned and practiced the skills of transfer while gaining their capability education, whether that is effectively adapted to the work situation is also based on a range of factors. These include:

- That competence is a product of the interaction of the skills possessed by an individual and the contexts in which they are expected to be operating in.
- That dispositional states affect competence and adaptability with conscious and unconscious components operating in different settings. The fact that conscious deliberation (skills of transfer/metacognition) appears to enhance adaptability suggests that assessing knowledge may be appropriate for assessing adaptability, whereas assessing knowledge as a predictor of competence isn't appropriate as competence is about performance in a context.
- That learning strategies (learning habits) are crucial in enhancing and supporting skill transfer/adaptability.

Ideally new workers undertaking integrated programmes should be assigned mentors or workplace verifiers. These could be supervisors or more experienced workers who are able to assist the new worker to transfer what they have learnt in the formal training environment with the tasks undertaken on the job. Current research has shown that the connections from formal to informal learning can be strengthened by deliberate interventions by mentors and by greater opportunities to apply new learning to a range of tasks in a range of situations. New workers' workplace learning conditions should ideally include a balance of support and

independence and a range of opportunities to practice skills, including literacy and numeracy skills, where this is an issue.

6. Case Study – Glass Apprentices

The Joinery Industry Training Organisation (JITO) is responsible for the glass processing and glazing sector in New Zealand. Traditionally this has been an industry with no formal qualifications although glazing apprentices did complete trade training as they were part of the building industry and needed to meet specific building regulations as part of their work specifications. With the advent of the National Qualifications Framework (NQF), national certificates were developed for both of these sectors. Both sectors have some skills in common that relate to health and safety, cutting glass and moving and storing glass. They share a common base qualification that covers underpinning knowledge relating to health and safety, customer service, history of glass making, glass industry terminology, primary glass manufacture, glass processes, glass types, glazing materials, glass properties, legislations and standards, glass ordering, pricing materials, documentation, and plastics used in glazing. New workers are required to complete the introductory qualification prior to completing their specific sector based qualification. The introductory qualification has traditionally been completed using self-paced workbooks that include knowledge based assessment. Training for the sector based qualifications has been completed by a combination of block courses and on-job learning with assessment taking place at the off-job training provider and in the workplace.

The ITO found that there was a low level of completion rates of the introductory qualification which was having an impact on apprentices completing their specific sector qualifications. This resulted in commissioning a research project in 2009 to understand how learning was happening on and off the job, the connections between them and where learning support could be provided.

The research asked a series of questions:

- How do glass apprentices manage formal and informal learning?
- How does block course learning support learning on the job?
- How do apprentices learn on the job and in self-directed study?
- How does learning on the job and self-directed study support further block course learning?
- How could learning be strengthened?

The research profiled four apprentices, four supervisors or mentors, and two trainers across different sites which encompassed both glazing and glass processing. The research took into account the apprentices backgrounds which were quite varied and looked at each section of the formal and informal learning separately.

The first section was the first block course and the job connections. The findings showed that the formal learning in the block course acted as a catalyst for informal learning activities such as watching experienced tradesmen, practising skills with and without supervision, asking questions and searching for new information. The formal-informal connections became the catalyst not only for learning at work but

also to encourage them to complete their self-paced distance learning. However three of the four apprentices struggled with their self-paced learning. The conclusion was that the connections from formal to informal learning could be strengthened by more deliberate interventions by mentors and by greater opportunity to apply new learning to a range of tasks in a range of situations.

The second section was learning on the job. The four apprentices in the study came from quite different backgrounds and were in quite different work situations. This seemed to make quite a difference to their success rates in terms of learning and assessment. Two of the apprentices were assigned a variety of jobs where they were responsible for managing their own work schedules. Feedback from their employers showed that they were able to manage their time, learnt from the skilled tradesmen they worked with and self-identified their mistakes. They seemed to be able to integrate what they had learnt on the block course into their everyday work experiences although they still had some trouble completing their self-paced learning modules. The other two apprentices were involved in more repetitive tasks with less work variety. However one of them did have another family member that worked in the same environment, was therefore more familiar with the type of work required and received informal mentoring support from this experienced worker. He is also self-motivated and asks questions when he is unsure. The other apprentice does not have English as a first language and is less confident in his knowledge and skills and less likely to ask for assistance. He tries to remain within his comfort zone where ever possible and doesn't attempt to vary his work tasks. His integration of formal and informal learning is the least successful and he would benefit most from mentoring support. Findings showed that while the informal learning was very valuable for all the apprentices, those that had a variety of tasks and were supported or mentored by experienced workers had more chance of integrating their formal and informal learning.

The third section was self-paced distance learning. Apprentices need to complete a series of self-paced learning modules to complete their introductory qualification. Most of the apprentices in the study had difficulty with these modules with some having greater difficulty than others. As outlined above apprentices undertaking self-paced distance learning need additional skills to literacy and numeracy to complete these modules successfully. They have to be able to manage their time, research information and present the information for assessment. These are not innate skills but skills that have to be learnt. The findings showed there was a strong correlation between the existence and effectiveness of workplace mentoring and apprentices' completion of their self-paced modules. One of the more successful models was where an office administrator was assigned as the workplace mentor. Because of their organisational skills they were able to assist the apprentice to organise and keep their records, plan their study, assist with locating information and send off completed assessments. The office administrator was not ranked on the same career ladder as the apprentice and was seen as a safe person to ask for assistance and to admit lack of knowledge.

The fourth section was further block course training and the link from work. Course trainers wanted to see stronger connections between themselves and on-job mentors as they felt it would be helpful to them if they knew what apprentices had

done before they came onto the course. They also felt it was important to provide detailed information about the course content to mentors back in the workplace in order to build the connections between the course and on-job learning. Apprentices appreciated the opportunity to practice skills in a learning environment where mistakes could be made. The findings highlighted that the co-operative learning environment of the block course is valuable in that it creates a positive learning atmosphere which can contribute to learners' success. The down side is that in many vocational learning situations literacy and numeracy issues are circumvented. This can be to avoid exposing struggling learners or because trainers have not had the professional development they need in order to know how to intervene appropriately and effectively. Trainers may see circumvention as the only way to get through a busy programme.

The overall findings of the research were as follows:

- The system of block course learning is effective. Most learners make new connections, apply learning, reflect, refine, and transform their practice.
- Strong learning links were apparent from courses to the apprentices' work.
- The links and support from job to course were weaker, largely due to poor mentoring.
- Some apprentices struggle with the expectations of the trade, coursework and study.
- Most apprentices struggle with distance learning.

On the job:

- Variety and a balance of autonomy and supervision produce the best outcomes.
- Opportunities to engage in tasks involving literacy, numeracy and a range of different skills need to be provided and supported on the job where possible.
- Apprentices' preparation for block courses will be enhanced by supervisors working through the material prior to attending the block course.

Distance learning:

- Apprentices who had on-job mentoring tended to complete their workbooks more quickly than those who hadn't.
- Support for distance learning seemed to be a relatively low priority in the workplace.
- Important skills needed to help apprentices complete distance learning workbooks and assessments are held by administrators.

Block courses:

- The course environment was experienced by apprentices as positive and unthreatening and they were comfortable with well established and varied routines.
- Apprentices need some skills (time management, literacy and numeracy, research) to be explicitly taught.
- Trainers would like to see better connections between themselves and mentors.

From these findings a number of recommendations have been made to the ITO. These include:

- That any mentoring support should acknowledge the constraints of employers and supervisors and provide acceptable learning support alternatives.
- That on-going support in mentoring is provided to new mentors over a period of time to help them recognise and work with learners who are struggling with expectations of the trade, coursework and study (particularly self-paced learning).
- It is important that apprentices have the opportunity to practice skills learnt on the course, when they are back on the job. The best circumstances for this practice are where the apprentice has a balance of supervision and autonomy in their work, and a variety of tasks.
- That mentors work with apprentices to create and provide to trainers a checklist of competencies practiced on the job between courses.

7. Summary

In this paper I have looked at what we mean when we look at workplace competence and how the formal and informal learning processes assist new workers to transfer what they learn from one context to another. The case study of glass apprentices highlights how if this process is done well it can assist a learner to successfully integrate their learning and assessment requirements across multiple contexts but also highlights the issues that can arise if the process is not supported.

The New Zealand NQF has been in operation for nearly two decades. During that period of time as uptake has increased and the requirements of the target audiences have changed, the methods used to deliver and assess training related to national competences have had to mature. The need to integrate formal and informal learning and assessment has become more important along with the need to fully understand how the process works and how to make the most of the opportunities the system offers. While we do not have all the answers we are moving down the road to a better understanding of how to improve the system so that the needs of all the stakeholders (learners, educators and employers) are met.

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