

Piloting Dual-Track Apprenticeships in South Africa

*Ken Duncan*¹

ABSTRACT

This article describes the rationale behind a pilot of Swiss/German-style 'dual-track' artisan apprenticeships being conducted by the South African Department of Higher Education and Training (DHET). It reviews progress made to date and difficulties encountered, and draws some tentative lessons from this experience.

KEY WORDS

Apprenticeships, artisan, block-release, VET colleges, dual-track, skills development, SETAs

BACKGROUND AND CONTEXT

South Africa has set itself the ambitious goal of producing 30'000 new artisans a year by 2030 (DHET, 2015) - more than double the present output of just over 14'000 par annum (NAMB 2015). To this end, the national Department of Higher Education and Training (DHET) has initiated a range of programmes aimed at increasing the number of apprentices being enrolled, improving the quality of their training, accelerating their progress, increasing their pass rate in trade tests and generally removing systemic blockages to artisan training and development. An early consideration was the delivery mechanism for apprenticeships. Currently, most apprenticeship training in South Africa is conducted through a long-established "block-release" system whereby apprentices spend three months of each year learning the theory of their trade in technical and vocational education and training (TVET) colleges and the remainder of the year in their workplaces, where they learn by doing the practice of the trade. While this system served well enough in the past, it has in recent years come under more critical scrutiny for its clear separation of theory and practice, its perceived weakness in promoting regular interaction between colleges that provide trade-theory courses and companies that employ the apprentices, and the extent to which public TVET colleges have as a result fallen behind industry in technology, work-processes and performance standards. It seemed, then, that other models of apprenticeship training should also be considered. South Africa is not alone in this respect. Apprenticeship systems have recently been, or are still being, reviewed and revised in a

¹ The author is the CEO of the Swiss-South African Cooperation Initiative, a public-private partnership in development aimed at improving the South African public skills development system, which is responsible for managing the dual-track apprenticeship pilot project.

number of other countries, making this an opportune time to consider lessons from best practice internationally.

In 2010, South Africa's Minister of Higher Education and Training led a high-level delegation to Germany where he became interested in the "dual-track" system of apprenticeship training in that country. This interest was reinforced in May 2011 by a similar technical visit to Switzerland, where the dual-track system is also used. At the end of that visit, in an address to the Swiss-South African Chamber of Commerce in Zurich, the Minister proposed that dual-track apprenticeships be piloted in South Africa. It was understood from the start that a sophisticated training system deeply embedded in a particular socio-economic context cannot simply be 'cut-and-pasted' from one country to another. However, there is no reason why the fundamental principles and even some specific procedures of good practice cannot be adopted and adapted elsewhere. The idea of piloting dual-track apprenticeships was debated within the DHET and some of its civil society partners as part of wider discussions that preceded publication of the DHET's 2013 ***White Paper on Post School Education and Training***. By mid-2012, the DHET was resolved to pursue a broad and multi-pronged strategy of revitalising public TVET colleges as hubs of initial artisan training through innovative delivery modes. It seemed that some form of dual-track apprenticeships might serve that objective and a decision was taken to proceed with a pilot.

PROJECT RATIONALE

The characteristic feature of a dual-track vocational education and training (VET) system is that it combines education at a vocational school or college with on-the-job training in the workplace *in a single, integrated learning programme*. This is different from apprenticeships in South African, where theoretical components (such as the N-courses) and sometimes even practical components are presented, assessed and certificated separately from workplace experience. Dual-track VET systems have long been standard in Germany, Switzerland and Austria, and more recently have also been adopted in Denmark, Holland, Hungary, Portugal and several countries in the Balkans and Asia. As practised in most of these countries, the dual-track system requires apprentices to spend about 75% of their time working in host companies, where they get on-the-job practical training and experience, and the remaining 25% in training colleges where they get a mix of theory, simulated practice and sheltered work.² Typically, apprentices work three or four days a week in the company and spend only

² The distinction being made here is that 'simulated practice' refers to practical tasks that have been designed by the instructor and assigned to the apprentice as a training exercise. It is really *pretend-work*. 'Sheltered practice', on the other hand, is work that has been commissioned by a commercial client and is being done in

one or two days in the college. This ensures rapid and reiterative application of newly-acquired knowledge and keeps the college instructors in close communication with workplace supervisors. Although this split-week rotation of apprentices between college and company is the most visible feature of dual-track apprenticeships, an equally-important but less obvious element is the way responsibilities are shared amongst the implementing partners. Employers and professional associations jointly bear the primary responsibility for organising and administering apprenticeships - including their curricula, performance standards, assessments, certification and overall quality assurance. The state acts as a notary of agreements between the partners and subsidises the public vocational education and training colleges. An Organisation for Economic Cooperation and Development (OECD) survey of employer engagement with apprenticeships found that the direct and decisive influence that Swiss employers have over every aspect of apprenticeships was a major reason for their high levels of confidence and participation in this form of training (OECD, 2009). This is an important point. Approximately 40% of all companies in Switzerland and 25% in Germany employ apprentices— a participation rate considerably higher than in most other countries (Steedman, 2011). No reliable data are available on the percentage of private-sector employers offering apprenticeships in South Africa but incomplete reports from the Sector Education and Training Authorities suggest that it is less than 5%, perhaps as low as 2%.

Dual-track apprenticeships in Switzerland, Germany and Austria have demonstrated definite advantages for the apprentices, colleges and employers alike. (Wolter *et al*, 2006; Múhlemann & Wolter, 2007; OECD, 2010). One important benefit for the apprentices is that they are from an early stage assigned meaningful work under real-life conditions. This fosters the development of their sense of responsibility and productive value. It also means that theory and practice are very closely integrated, immediately reinforcing one another and thereby promoting more thorough learning. This in turn contributes towards high trade-test pass rates; both Germany and Switzerland boast on-schedule pass rates of over 90% for their apprentices, compared with less than 50% in South Africa. (Roodt & Wildschut, 2012) There is also evidence that German and Swiss apprentices attain higher levels of competence than their South African counterparts. For example, Swiss and German contestants are invariably amongst the top performers in the biennial World Skills Competitions, while South African entrants have to date fared poorly. Recent research suggests that few South African apprentices progress beyond a nominal level of competence in their trade (Rauner *et al*, 2012).

the college by apprentices under supervision. It is not merely a training exercise but *real* work that must be performed to the clients' specifications, including quality of workmanship, delivery time and budget.

Benefits of the dual system for colleges include regular interaction with local employers, which in turn leads to closer alignment of the college curricula with the needs of industry and fewer differences between college and company in terms of work practices and ethos (including discipline, timekeeping and quality standards). It also provides a foundation for other forms of collaboration between college and company, such as staff exchanges, additional work and training contracts in both directions, and the promotion of action-research and reflective practice.

Given the centrality of employers to the apprenticeship systems of Germany and Switzerland, it is no surprise that they are operated at the lowest possible cost to companies. This is another essential ingredient for their success and a major part of their appeal to employers. Although the cost of training conducted in a public college or vocational school is covered by the state from the general fiscus, along with social insurance contributions, the apprentice's in-company training and employment costs must still be borne by the employer, who recoups them from the value of the apprentice's work. Research in both Germany and Switzerland has repeatedly shown that there is a nett benefit to a company in hosting an apprentice – that is to say, the employer actually makes a profit when the value of the apprentice's labour is deducted from the cost of training. The higher the level of the job being trained for, the greater the employer's return on investment in an apprenticeship. So, apart from securing a supply of skilled labour, there are good financial arguments for hosting apprentices in Germany and Switzerland. This is why many firms train more apprentices than they themselves need (OPET, 2004 & 2011; Rauner *et al*, 2009; Mühlemann & Wolter, 2007; Zwick, 2007; Tremblay & Le Bot, 2003). The exact opposite is true in South Africa, where apprentices spend far less time on production and far more in a training centre than their Swiss or German counterparts. Thus, apprenticeships are viewed by many employers as a cost that must be reduced as far as possible and are rarely implemented without the provision of a training grant from one of the parastatal Sector Education and Training Authorities (SETAs).³

³ According to figures presented on 24 March 2012 to the HRD Council's Task Team on Artisan Training and Development, upon which the author serves, the average cost of training an apprentice in South Africa at that time was around R300'000 over three years. The task team tried to quantify the training grant that would be necessary to make up the difference between the value of an apprentice's work and his/her total cost to employer, and so make it palatable for employers to train above their own needs. However, in the absence of any reliable data on the productive value of apprentices, the task team struggled to come up with a figure that would satisfy employers but not bankrupt the SETAs or the National Skills Fund, from where the grant would have to come. After much debate, in 2014 a standardised grant of R139'350 per apprentice was agreed upon.

With the prospective benefits of dual-track apprenticeships in mind, the South African DHET launched its pilot of dual-track apprenticeships in mid-2012, with an initial time-horizon of 4 years, i.e. to July 2016. The Swiss-South African Cooperation Initiative (SSACI), a development agency with considerable experience in TVET through apprenticeships and the public college system in South Africa was contracted by the DHET to manage the implementation of the pilot project.

OBJECTIVES & FOCUS

The principal objective of the pilot project is to test the value of dual-system apprenticeships for South Africa, i.e. their practicality for local conditions, their effectiveness, their cost and their appeal to local employers. Secondary objectives are to experiment with a more flexible delivery of trade-theory training courses by public TVET colleges and to gather “real-time” information (i.e. while training is under way) on the relevance to industry of the courses that currently form the trade-theory component of apprenticeships.

The project focuses on trades that are currently in high demand in the engineering industry, namely mechatronics technicians, welders, electricians and vehicle body-builders. Apprentices are drawn from students in public TVET colleges and undertake workplace-based training in parallel with their trade-related college studies through a weekly-rotation system, with alternate weeks being spent in the college and the workplace. This suited the employers better than a split-week system because they felt that it typically takes 4-5 days to complete a meaningful task in the workplace. The apprentices also spend their college vacations at the workplace so as to gain as much work exposure and practical experience as possible.

The project has two funding channels:

- i. The National Skills Fund which is covering non-recurring project-specific costs such as management and evaluation
- ii. Apprenticeship training grants from participating Sector Education and Training Authorities (SETAs) which, in line with national grant funding policy, offer a standard grant to employers of R139,350 per apprentices to cover recurring costs such as the training expenses and the apprentices' allowances

This reflects an important design-principle of the project – namely, that dual-system apprenticeships should be financially viable within the existing funding framework for apprenticeships. If the project

proves that a dual-system approach is effective and should be more widely adopted, sustainable funding will be available through established systems and formulae.

By the end of 2014, three sites, each comprising a public TVET college and a cluster of employers, and each focusing on a specific trade, had been established. The curricula of the college programmes and the trade training schedules had been mapped and integrated with one another and training was under way with 20-30 apprentices at each site.

RESEARCH METHODOLOGY

While there have been a number of comparative studies of apprenticeship systems in different countries – most recently by Harhoff and Kane (1997), Steedman (2011), the International Labour Organisation (ILO, 2012 and 2013), and Smith and Kemmis (2013) - they are mostly confined to descriptions of the various countries' policies, regulations and organisational arrangements regarding apprenticeships, rather than evaluations of their outputs and efficacy. There is an obvious reason for this. Apprenticeships in any country are interwoven with the broader educational, social, cultural, political, economic and industrial relations systems, and so make comparisons difficult and often unhelpful. Moreover, few countries implement different apprenticeship systems simultaneously - South Africa does so more by accident than by design⁴ - so it is seldom possible to compare different approaches within the same context. Nevertheless, Steedman (2011) and the ILO (2013) report that the dual-track systems in Germany, Switzerland and Austria seem to have better progression and completion rates, and better labour market outcomes in terms of employment, than the systems in other countries in their studies.

For this project, it was assumed that the key measures of success or failure would be the progression and completion rates of the apprenticeships and the uptake of further cohorts of apprentices by employers beyond the pilot phase. These will not be determinable until after the completion of the pilot in 2016. In the meantime, though, it was considered important to capture experience and lessons learned along the way, which are the focus of this paper. Three months after the commencement of the project, all seven employers and each apprentice were given questionnaires to complete on their

⁴ From 2001 to 2013 apprenticeships in South Africa were administered by at least 14 different parastatal Sector Education and Training authorities and a few other state agencies without any consensus on the organisational arrangements, training curricula, standards of competence, quality assurance or even the occupations for which a trade test was required.

experience of the project to date. From the beginning, monthly meetings have been held with the seven companies and three colleges involved in the project to discuss experiences, issues, problems and progress. In October 2014, the project was evaluated by independent researchers commissioned by SSACI, who conducted a comprehensive review of project documentation and semi-structured interviews with project personnel within the management agency, colleges and participating companies. Data from all these sources, and from quarterly project management reports based on site visits and interviews with college and company staff and the apprentice themselves, are distilled into the evaluative comments in this article.

PROGRESS TO DATE

The first apprentices in the project are only scheduled to do their trade-tests in March 2016, so it is too early to assess the results of their training. In the meantime, however, college lecturers report that the apprentices' early exposure to the workplace has enhanced their academic performance. This came out strongly in a survey of the opinions of college staff conducted in May 2014 (SSACI, 2014), wherein typical comments were:

- "Our instructors love teaching the [dual-track] students. Their commitment and drive to learn have stepped up tremendously since they commenced on the programme."
- "You can immediately distinguish the [dual-track] learners from the rest of the group: Work ethic, tidiness, punctuality – they have taken on the values that are key for success in a workplace."

The external evaluators (DeWaal & Franklin, 2014) reported similar findings:

"Lecturers at both colleges highlighted their observations of how the [dual-track] has benefited apprentices thus far:

- Improved attitudes towards college and coming to class – lecturers commented they enjoy teaching the [dual-track pilot project] apprentices because they are more engaged during class.
- Apprentices are described as being more 'future' directed and seem to think about their careers more seriously than their [non-project] counterparts.
- There has also been an improvement in student motivation.
- Lecturers also commented that the quality of apprentice also seems to be much better in terms of work quality, social, communication and, generally, better well-rounded apprentice/worker for the workplace. "

This impression seems to be lasting. In a report to the project manager in July 2015 (SSACI, 2015), one of the participating colleges noted that:

“The advantages of the [dual-track pilot] programme for the college are that:

- You have a much more balanced student with a lot more dedication towards his/her academic performance.
- The students are always present in class and have a high attendance rate.
- The workplace also gets more involved in the curriculum of the college and can give some valid inputs on how to make it better and more workplace related.
- Discipline of the students in class is very good and we as lecturers do not have any disciplinary issues with the students. “

Participating colleges say that the pilot project has also brought other benefits at institutional level. According to the evaluators (DeWaal & Franklin, 2014):

“Lecturers commented that through their involvement in the [pilot project] they have had access to additional opportunities such as meeting more regularly with employers... These types of experiences have benefited the way they teach all their students, not just [dual-system] apprentices, and they are also much more aware of how they set-up their own assessments.”

Employers, too, have responded well to the dual-track system, especially the close interaction between college and company that it fosters. The evaluators (DeWaal & Franklin, 2014) found that:

“Despite the challenges of the [pilot project], employers are generally positive about the dual-system and find working more closely with the colleges of particular benefit as a first step towards bridging the gaps between industry and college training.”

For example, the HR Manager at one large company employing dual-track apprentices wrote to the project manager in July 2014 (SSACI, 2014) that:

“I do find the dual system better. I feel the fact that the learners are continually exposed to both the educational institution and workplace simultaneously affords them a better chance of actually passing the trade test.”

This view seems to have been reinforced by subsequent experience because in July 2015 the same manager wrote that (SSACI, 2015):

“The dual system is definitely now our preferred method of training artisans. The project has a number of benefits... Firstly, it is structured in such a way that colleges and employers have to engage with each other on a constant basis. We never had to do that before but now we are in regular contact with the college as we have to discuss curriculum issues, student rotations, logbooks, student discipline etc. ... In this way, the system builds the capacity of the

local college and ensures that colleges train to the needs of industry. Having access to a well-run public college that employers have confidence in significantly reduces training costs.

“The second advantage of the project is that we have found that students are learning very quickly. The dual rotation allows them to learn the theory in the college and then immediately have this reinforced with on-the-job experience. This method of training is much more effective than training models that front-load the theory and have the practical component tacked-on right at the end of the training programme. Students that do the theory first with the practical workplace experience only months or even years later, have often forgotten the theory by the time they arrive in the workplace.

“The [dual-track system] ensures that the apprentices become productive very quickly. This means that the students start generating profit for the company and contribute to offsetting their training costs. We give them real work to do and don’t keep them sitting around doing simulated training in a training centre. This is invaluable for the students as they - at a very early stage - begin to gain valuable work experience.”

CHALLENGES ENCOUNTERED

Notwithstanding these encouraging findings and comments, numerous systemic and operational difficulties with serious implications for South Africa’s national public skills development system have been encountered during, and sometimes exposed by, the pilot project (De Waal & Franklin, 2014; SSACI, 2014 & 2015). Foremost among these are:

1. **A widespread lack of understanding of the emerging new regulatory dispensation for apprenticeships.** South Africa’s national training system is still under construction, including apprenticeship funding and administration, the approval of workplaces as training sites, the determination of apprentices’ allowances and a host of other important details. SETAs, colleges and employers have different understandings of what regulations are currently in force and when new ones will come into effect. This creates high levels of uncertainty amongst decision-makers (and hence slow decision-making) and high potential for misunderstandings.
2. **Lack of employer confidence in government programmes:** Many employers, on being invited to participate in the pilot project, expressed reluctance to take on the risks of a programme as

innovative as dual-track apprenticeships, citing bad experiences with previous government-supported initiatives. Of great concern to the employers is the possibility that the colleges or SETAs will fail to deliver on their part of the bargain, leaving the company to make up the resulting deficits. Clearly, much work will have to be done to build employers' confidence in state systems.

3. **The inefficiency of SETAs**, which register apprenticeship contracts and administer the grants. Examples of onerous and sclerotic administration encountered in this project include:

- The registration of apprentices by the relevant SETA for the wrong trade or at the wrong level, an error that took an inordinately long time to rectify
- Documents that are long and full of arcane language, have to be witnessed by as many as six different people, be submitted to head office via a regional office which makes no input other than to stamp the original, and finally take months to process within the SETA
- The insistence of each SETA on its own format for information that more than one may require. For instance, applicants for apprenticeships must undergo a medical examination and the report, signed by a doctor, is sent to the SETA to which the employer is affiliated. However, no applicant can know in advance which prospective employer will accept him or, therefore, which SETA will register his contract. Thus, some applicants submitted medical reports in one format only to be told later by a SETA to go back to the doctor and get the report re-written in another format, at their own expense.

4. **Poor administration amongst some host-companies.** This took project management by surprise, given the private-sector's loud and frequent criticisms of government systems. The HR departments of some large participating firms mishandled the relatively simple processes of interviewing, selecting and inducting candidate apprentices. Many applicants were not told whether they had been chosen; successful applicants were instructed to sign contracts before being given a chance to read them; information regarding conditions of service was withheld ("Your pay is not important"); and so on. It seems that inefficiency is not, after all, a state monopoly.

5. **Large gaps in college capacity:** All participating colleges appear to be under strain from the workload of multiple projects superimposed upon their normal activities. Staff participating in the dual-track apprenticeship pilot project changed often and it was difficult to retain consistency in planning and implementing the college components. This led to delays and errors, such as keeping employers waiting for the names of suitable candidates and putting forward prospective

apprentices who did not meet essential selection criteria. Colleges often needed repeated exhortation and guidance in attending to tasks that should be part of standard college procedures, such as verifying applicants' biographical information and educational attainments, lesson planning and preparation, and liaison with employers. Moreover, the colleges' assessments of apprentices' levels of knowledge and skill often differ dramatically from those of employers, suggesting that teaching staff in the colleges are unfamiliar with performance standards in the industries for which they are ostensibly preparing their students.

It is very worrying to think that the greatest threat to effective skills training in South Africa may not be an absence of innovative ideas or a reluctance to adopt them, but simply the inability of the main partners – colleges, industry and the SETAs – to perform their necessary functions.

In addition to the above, it must also be said that braiding the college training inputs into tasks and processes in the workplace so as to create an integrated, dual-track training curriculum has proved far more difficult than expected. Notwithstanding their mutual goodwill, colleges and employers have come into the project with utterly different views on what constitutes effective training, appropriate tasks for apprentices in different stages of learning, acceptable job performance and the assessment thereof, workplace behaviour, and responsibility for ensuring each of these essential elements. These differences take a long time and lots of shared, sometimes painful, experience to resolve. The college curricula, at least as they are currently interpreted and implemented by the teaching staff, are far from satisfactory in terms of their content, standards and overall alignment to industry. Moreover, the SETA-approved schedules for workplace-based training in the target trades are very different in both content and organisation from the college curricula. This is not a new insight – researchers and employers have been saying it for years – but the dual-track apprenticeship pilot project, by bringing participating colleges and companies into close interaction with one another for the first time in decades, has starkly highlighted their differences and the need for coherent artisan training curricula. This spurred the National Artisan Moderation Body (NAMB) to expedite the development of new occupational qualifications in the artisan trades that the DHET intends to implement in public colleges from 2016 onwards.

The pilot project has also highlighted an unintended and undesirable effect of the apprenticeship training grants on offer by the SETAs as part of the national levy-grant system. It has long been a complaint of organised labour and not a few DHET and even SETA officials that many South African employers will not 'train an employee to use a pencil unless they receive a grant to do so.' In the dual-track apprenticeship pilot project, the project managers (SSACI, 2014 & 2015) have seen apprentices

spending inordinate amounts of time in the workplace training centre, in addition to the public TVET college, instead of on production, where the skills and habits of performance to standards are best acquired. We hypothesise that employers would not do this if the SETA training subsidy did not skew the finances of the apprenticeship to such an extent that the apprentice's productivity is not critical to a positive cost-benefit calculation.

CONCLUSION

On balance, as the section "Progress to date" in this article notes, the pilot project, now two-thirds of the way towards its conclusion, has already brought value to colleges and employers. Significantly, as a result of experience gained to date and the interest it has generated in the concept of dual-track apprenticeships, other agencies have now come forward with additional sites and resources, including the German government's international agency for development co-operation, GIZ, which has committed funding and personnel for a parallel dual-system pilot project to be run from May 2015 to December 2018 in four new sites. An important new element in this project will be the structuring of the curricula around new content and outcome-performance specifications, called the National Trade Test Content, now being defined by the National Artisan Moderation Body for each trade. The first two of these new curricula – for electricians and welders – are currently being developed by SSACI, under contract to the DHET, and reflect lessons learned from the dual-track apprenticeships pilot project so far. Thus, the project may already be said to be making a definite and positive impact on the national artisan training system.

REFERENCES

DHET (2015): *Revised Policy on Generic National Artisan Workplace Data, Learner Grant Funding and Administration System*. Department of Higher Education and Training, Pretoria, South Africa.

De Waal, L & Franklin, M (2014): *The Dual-system Apprenticeship Pilot (DSAP) Project: Process Evaluation Report*. [Unpublished report submitted to the project Steering Committee, November 2014]. M&ESure, Cape Town.

Harhoff, D. & Kane, T.J. (1997): "Is the German apprenticeship system a panacea for the U.S. labour market?" *In: Journal of Population Economics*, Vol 10, Issue 2, June 1997, pp171-196.

ILO (2012): *“Overview of Apprenticeship Systems and Issues”*. International Labour Organisation, Geneva.

ILO (2013): *“Towards a model apprenticeship framework: A comparative analysis of national apprenticeship systems”*. International Labour Organisation, Geneva.

Mühlemann, S. & Wolter, S. (2007): *“Apprenticeship Training is Profitable”* [Monograph of the Centre for Research in Economics of Education]. University of Bern, Bern.

NAMB [National Artisan Moderation Body] (2015): *Historical Completions 2011-2015*. [Report to Artisan Development Technical Task Team, July 2015]. DHET, Pretoria.

OPET (2004 and 2011): *“Vocational and Professional Education and Training in Switzerland”*, 2004 and 2011 editions. The Swiss Federal Office for Professional Education & Technology, Bern

OECD (2009): *“Learning for Jobs: OECD Reviews of Vocational Education and Training”*. [Monograph of the Education and Training Policy Division, Directorate for Education.] Organisation for Economic Cooperation & Development, Paris.

OECD (2010): *“Vocational Education and Training in Germany: Strengths, Challenges and Recommendations”*. [Monograph of the Education and Training Policy Division, Directorate for Education]. Organisation for Economic Cooperation & Development, Paris

Rauner, F; Heinemann, L; Piering, D; Hauschildt, U. (2012): *“Project Report on the COMET Pilot Test South Africa”*. University of Bremen; Germany.

Rauner, F; Heinemann, L; Piering, D; Bischoff, R (2009): *“Cost-Benefits and Quality of Apprenticeships – A Regional case Study”* In Rauner, F & Smith, E: *“Rediscovering Apprenticeship: Findings of the International Network on Innovative Apprenticeship”*. Springer, Dordrecht

Roodt, J & Wildschut, A (2012): *“The trade test — a constraint on artisan skilling?”* In: HSRC Review, Vol 10 – No.1. Human Sciences Research Council, Pretoria.

Smith, E. & Kemmis, R.B. (2013): *“Globalising the apprenticeship concept: How far can apprenticeship systems be compared across countries and what can be gained?”* In: Akoojee, S., Gonon, P., Hauschildt, U. & Hofman, C. (eds): *“Apprenticeship in a Globalised World: Premises, Promises and Pitfalls”*. LIT, Berlin.

SSACI (2014): *Project Management Report, July 2014*. Swiss-South African Cooperation Initiative, Jhb.

SSACI (2015): *Project Management Report, July 2015*. Swiss-South African Cooperation Initiative, Jhb.

Steedman, H. (2011): *“The State of Apprenticeship in 2010”* [Monograph of the Centre for Economic Performance]. London School of Economics, London

Steedman, H. (2012): *“Overview of Apprenticeship Systems and Issues”* [Monograph of the ILO] ILO, Geneva

Tremblay, D-G. & Le Bot, I. (2003): *“The German Dual Apprenticeship System: Analysis of its Evolution and Present Challenges”*. Research Note No. 2003-4A. University of Quebec, Montreal.

Wolter, S., Mühlemann, S. & Schweri, J. (2006): *“Why some firms train apprentices and many do not.”* In *German Economic Review* 7(3) pp249-264

Zwick, T. (2007): *“Apprenticeship training in Germany: Investment or productivity-driven?”* [Monograph of the Centre for European Economic Research] ZEW, Mannheim.
