2008 ITWeb-JCSE Skills Survey

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Introduction

You've seen the headlines – but what is the reality? Does the South African ICT sector face a skills crisis, or are its practitioners filling the gaps through a variety of learning initiatives? The Department of Labour issued the National Master Scarce Skills list at the end of 2007, indicating that the ICT sector had been unable to fill 37 565 positions at that time. The categories of Managers, Software application programmers and Network & Support professionals all have more that 6 000 vacancies each, closely followed by 5 500 business and system analysts. IT Intellect is quoted as saying that 115 000 additional IT jobs are required in the lead up to the 2010 Soccer World Cup.

Dimension Data pointed out in August 2008 that IT environments are becoming more complex at infrastructure level, with the widespread adoption of converged communications and IP telephony technologies, stating that these cannot be maintained by legacy skills.

Gartner stated at its 2008 Cape Town conference that every enterprise should adopt a school to improve the output. Their research suggests that the dire shortage of qualified technicians and business leaders is inhibiting the performance of IT companies around the world. Their advice is that hi-tech companies need to make IT more attractive to young people, because (between now and 2010) the demand for qualified IT professionals will outstrip supply globally.

Against this background, should we be surprised that **100%** of the South African companies responding to the 2008 ITWeb-JCSE Skills Survey **say that the skills shortage is either having a major impact on their business or is affecting their viability**?

Another serious question raised by the results of this survey is whether the South African **ICT sector is exacerbating the skills shortage** by requiring the average practitioner to perform several roles. This not only raises the barrier to entry for such positions, so reducing the number of likely applicants, it also increases the costs of such people to their employers.

Survey Rationale and Process

ITWeb and the Joburg Centre for Software Engineering (JCSE) agreed that the skills issue that had been examined in 2006 required a fresh look, with the intention of creating a benchmark that would form the launch pad for an annual survey.

The objectives were to identify the most pressing skills needs from the corporate perspective and to balance that with a view of the current skills capacity of practitioners and their intentions for future skills development.

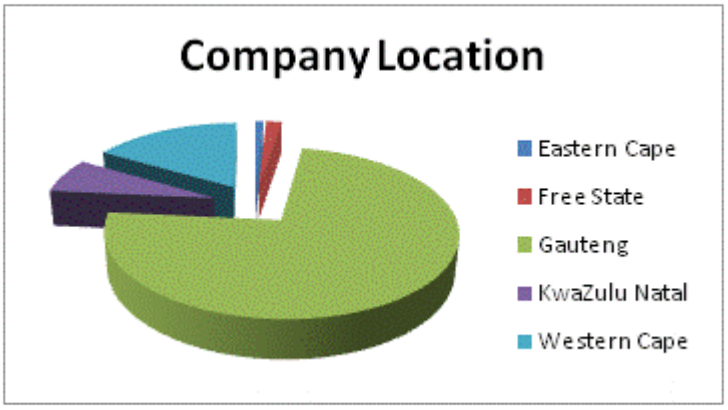
The process was to bring together the talents of ITWeb and JCSE by combining their strengths to reach the market with relevant questions and to derive meaningful data from

the responses. JCSE devised the questionnaires and ITWeb published them in the form of an on-line survey. Certain groups were also given paper-based questionnaires to complete. The survey was carried out in July and August 2008 and responses from both sources were captured into spreadsheets, from which the analysis was carried out. JCSE did the analysis work and prepared the reports and presentations.

A summary of the output is published in *Brainstorm* and *iWeek* and released at the Skills Survey breakfast event in Sandton on 16 September 2008.

Corporate Responses

Against a target of 100, 115 valid responses were received from corporate executives from different enterprises, more than half of whom were of C-level or Director status within their enterprise. Almost 75% of the companies are located in Gauteng. No corporate responses were received from Limpopo, Mpumalanga, North West Province or Northern Cape.

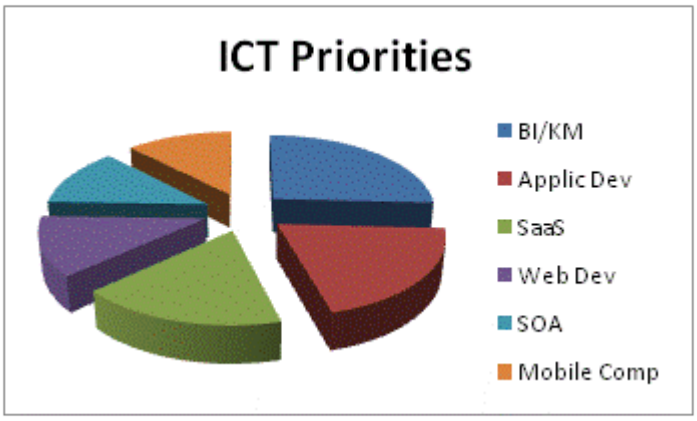


The majority of the enterprises were South African privately owned (non-listed) companies in the ICT sector. This group represented 60% of the respondents, with a further 15% being South African listed companies. The remaining respondents were spread across the following sectors: Agriculture/Fishing, Construction, Education/Training, Financial Services, Government, Manufacturing/Engineering, Media/Advertising/Printing/Publishing, Retail/Wholesale, Transport and Other Services. 8 state owned enterprises, 5 foreign owned companies and 4 academic institutions also responded.

In line with the profile of South African businesses, over 40% have less than 50 employees, with a further 20% having between 50 and 250 staff members. Accordingly, the "IT departments" within these enterprises are generally very small, with over 70% employing less than 50 employees, and within that group, 40% have less than 10 people supplying IT functions to the enterprise.

ICT Priorities

Respondents were asked to rank their ICT priorities for the next 1 to 3 years in order of importance. They selected their choices from a list of 24 areas of technology direction and the top three priorities were then rated, to produce the final list of the top 6.



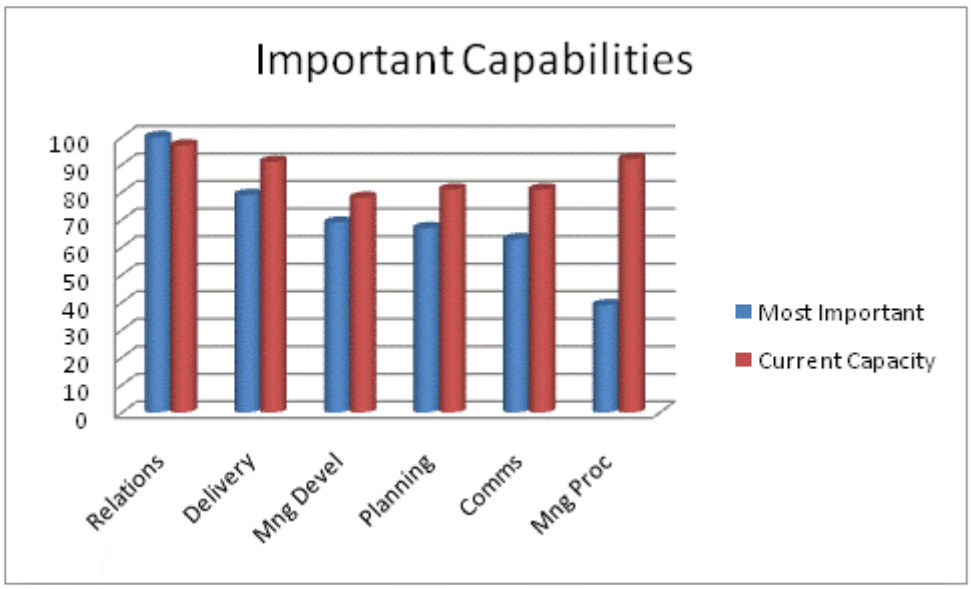
The highest ranking is clearly **Business Intelligence and Knowledge Management**, indicating the growing recognition that these are the tools of successful enterprises in the future.

This is followed by **Application Development**, showing that the need for software solutions that are relevant to the individual enterprise continues to figure strongly in the minds of ICT executives. Of growing importance is the use of **Software as a Service** (SaaS), as the offerings available across an increasingly stable network infrastructure become more sophisticated and affordable.

The remaining three of the top six priorities are seen as equally important. They are Service Oriented Architecture (SOA), Web Development and Mobile Computing.

Business Capabilities

In applying technical talent to the production of solutions for internal and external clients, there are a range of business capabilities that enhance the success of the implementation and support of the technology. Respondents are asked to rate the importance of these capabilities and to indicate the degree to which they felt their current capacity was sufficient.



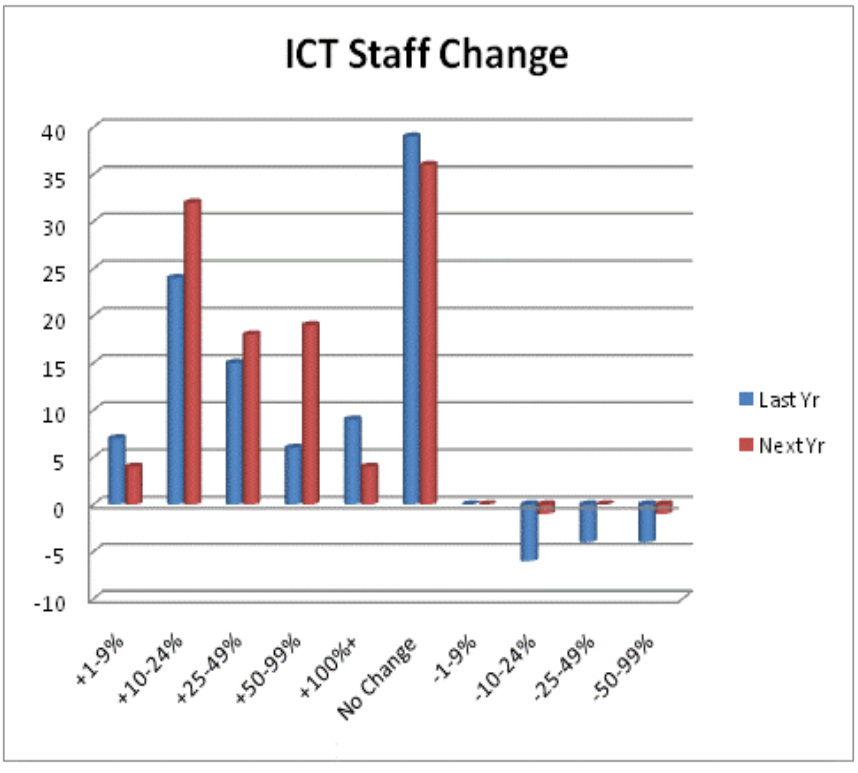
There was universal agreement that the **management of relationships with clients/users is of vital importance**, fairly closely followed by the need for efficient delivery of IT operations. The management of IT development and the processes of planning architecture and infrastructure are also seen as playing an important role. Almost in the same rating is the need for good verbal and written communications skills, acknowledged by 60% of respondents as most important.

It is probably a reflection of the profile of the respondents (mostly in the supply side of the ICT sector) that the management of IT procurement and sourcing of products and services was seen to be of lesser importance than the other capabilities.

Interestingly, with the exception of relationship management, all respondents felt that their enterprises had sufficient current capacity to meet the needs for these particular capabilities. The capabilities might be described as "soft skills" or management skills, often acquired through the informal processes of long experience.

Staff Dynamics

Having established the size of the IT department, respondents were asked to indicate how the numbers in the department had increased or decreased over the last 12 months and to estimate how the numbers would change in the year ahead.



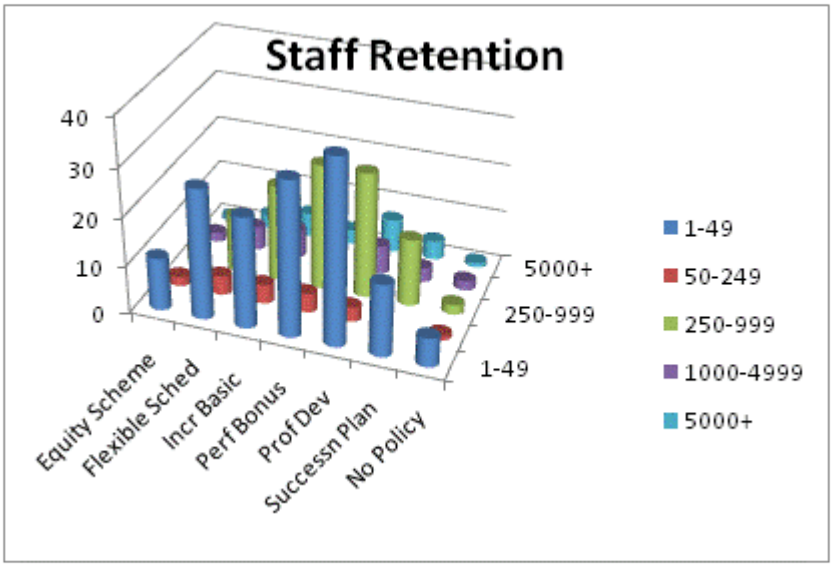
Although between 30% and 35% said that there had been/would be no change in either year, the **majority showed a continuing increase in ICT personnel**, with most expecting the staff numbers to grow by between 10 and 50%.

A small minority showed a decrease in personnel last year and only two companies expected a reduction in staff numbers in the year ahead.

Although this is good news, reflecting the sector's continued growth in both the local and the global economies, it does represent a further pressure on the skills shortage in the ICT sector. If the results of the survey were extrapolated across the whole sector, they would

suggest a need for another 35 000 practitioners, over and above the ones reported in the National Scarce Skills Report for 2007.

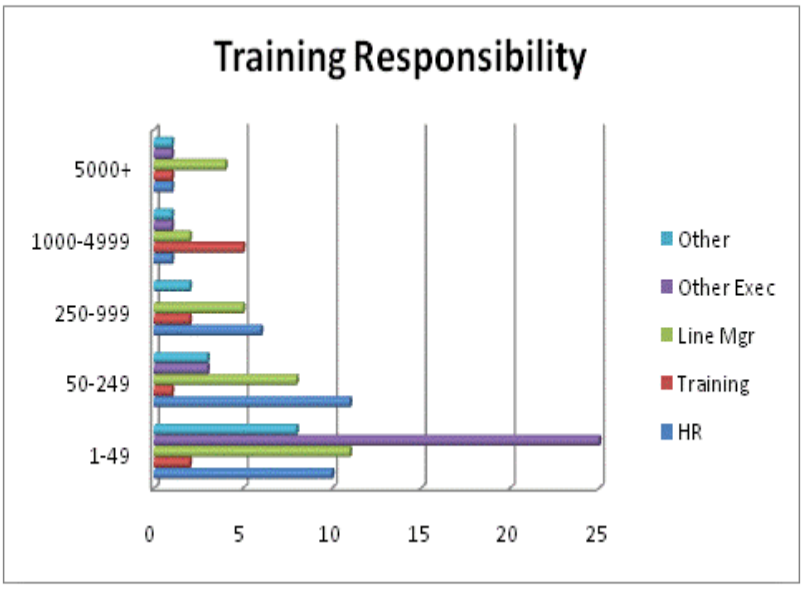
In establishing how the respondents approached the problems of skills shortages, they were asked to show which policies were in place to improve the retention of staff, who was responsible for training and what attributes were important at the point of hiring new staff members.



Most employers utilise a range of incentives to improve the loyalty of their key personnel. Professional development support and performance bonuses are the most popular across all sizes of company. Flexible scheduling is particularly used in small companies, reflecting the more easy-going culture often found at this level.

Paying an increased basic to attract scarce skills is a logical response to the market forces. Relatively few companies have a succession plan in place and almost 10% (including, surprisingly, some of the larger companies) have no formal policy on staff retention. Equity schemes are also in place in relatively few companies.

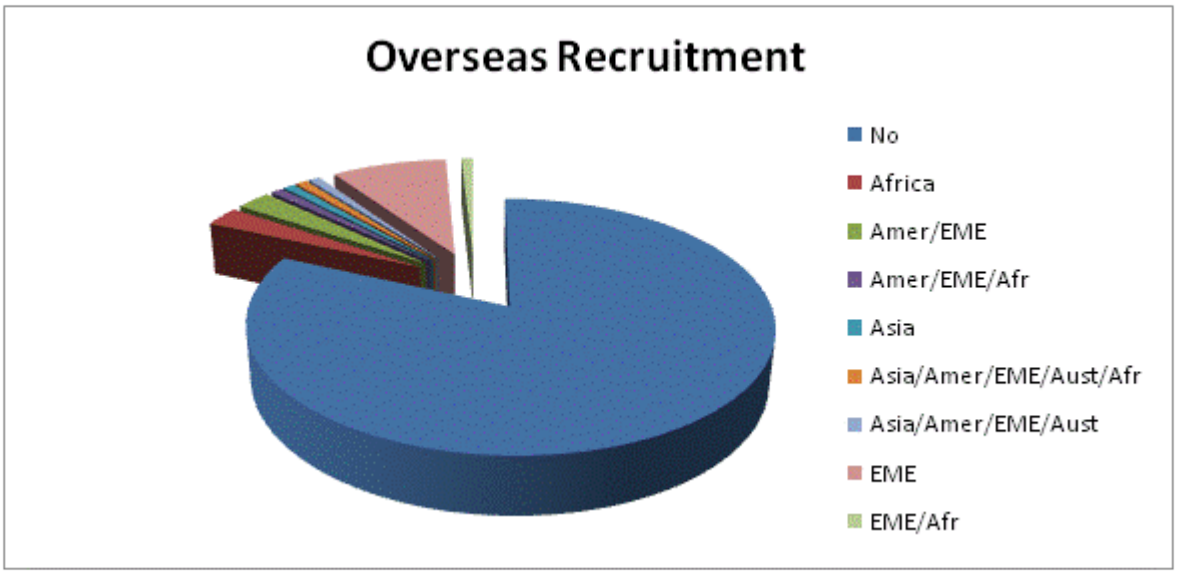
Although it is not surprising that a senior executive carries responsibility for training and skills development in small enterprises, it is interesting to note how **few companies have a specific training function in their structure**. The exception is in companies of between 1 000 and 5 000 employees, where the training department is in clear evidence.



In many cases, across all sizes of enterprise, the

responsibility falls on the shoulders of the line manager. While it may be argued that this person is aware of the needs of the staff within his/her control, it is more likely that the manager will have **difficulty in granting time for training, against the pressures of deadlines and delivery schedules**.

Respondents were also asked if they recruited skills from overseas and, if so, from which regions of the world.



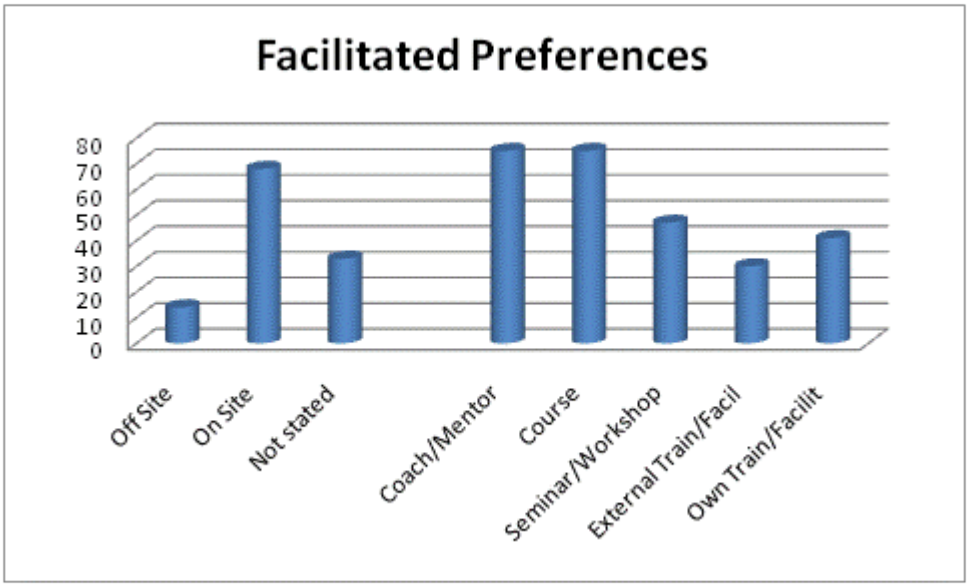
Over 80% of companies responded that they do not recruit overseas. Of those that do, the most popular source of recruits is Europe/Middle East, followed by America and Africa.

When it came to hiring new staff, or developing the capacity of existing staff, respondents were asked to rate the various levels and types of qualification in order of importance. Although a graduate degree, followed by a tertiary diploma and a post-graduate degree are regarded as the most important requirements in hiring and developing staff, it is generally agreed that, **whatever the qualification, it must be acceptable internationally**. From the employer's perspective, this ensures that the standard of ability available from the candidate is consonant with the global nature of the ICT market.

Certificates, whether issued by an academic institution, an industry association or a vendor certification programme, were regarded as least important.

Corporate Preferences

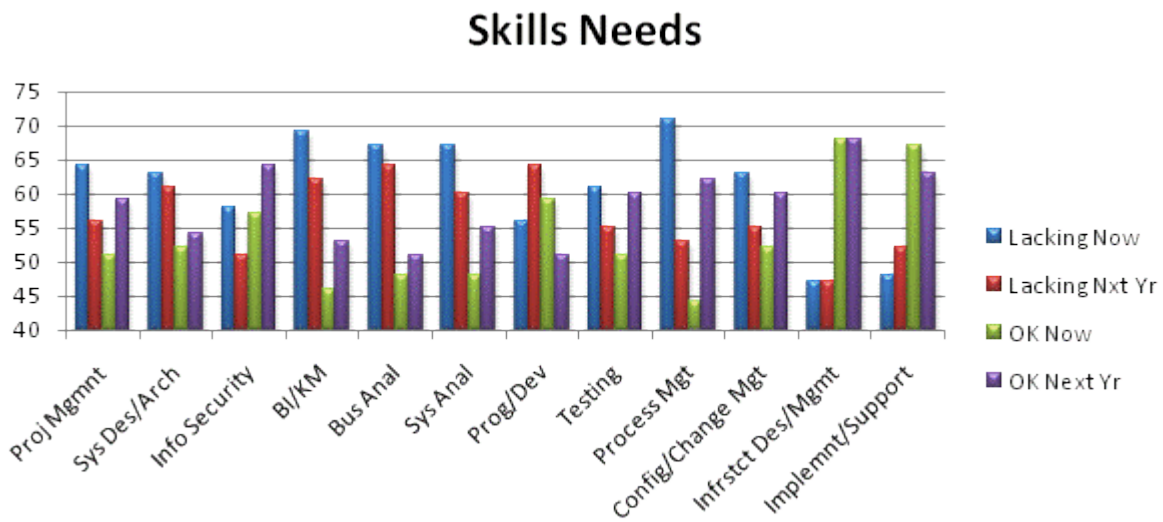
Respondents were asked to indicate how they preferred to develop skills in their work force. They displayed a clear preference for **on site training**, using coaches and mentors, with formal courses. This preference is supported by the indication that knowledge sharing is overwhelmingly the most popular method of gaining skills in the self-regulated environment. These findings will be supported by the responses from the individual practitioners, as shown later in this report.



When it came to management training, mentoring was preferred by 70% of respondents, followed by coaching, formal management courses and soft skills training. In an environment where management skills are regarded as scarce skills, it can be suggested that the quality of management development offered by mentoring has the potential to be lower than expected. This will be as a result of the unregulated and unsupervised nature of such training, and its propensity to pass on bad habits along with the good.

When external training providers are required, respondents clearly preferred the vendors. This is logical, as they are best able to train in the use of their products at every level. For the more generic training, there was little difference in the preference for commercial providers and academic institutions. Most employers would use the services of the provider appropriate to the skills development need.

Skills Needs



There are a number of dimensions to the chart above. The first two bars (blue and red) indicate the level of responses to the questions “Are you lacking these skills now?” and “Will

you be lacking these skills a year from now?". These responses are offset by the responses in the green and purple bars which show the proportion of respondents who feel that they have sufficient capacity in the skills now and their expectation of the situation a year from now.

Skills in highest demand now are: Process Management, Business Intelligence & Knowledge Management, Business Analysis and System(s) Analysis. These are followed by Project Management, Systems Design/Architecture and Configuration/Change Management. That there will be improvement in some of these areas is reflected in the anticipated shortages next year: Programming and Development, Business Analysis, Business Intelligence and Knowledge Management, Systems Design and Architecture.

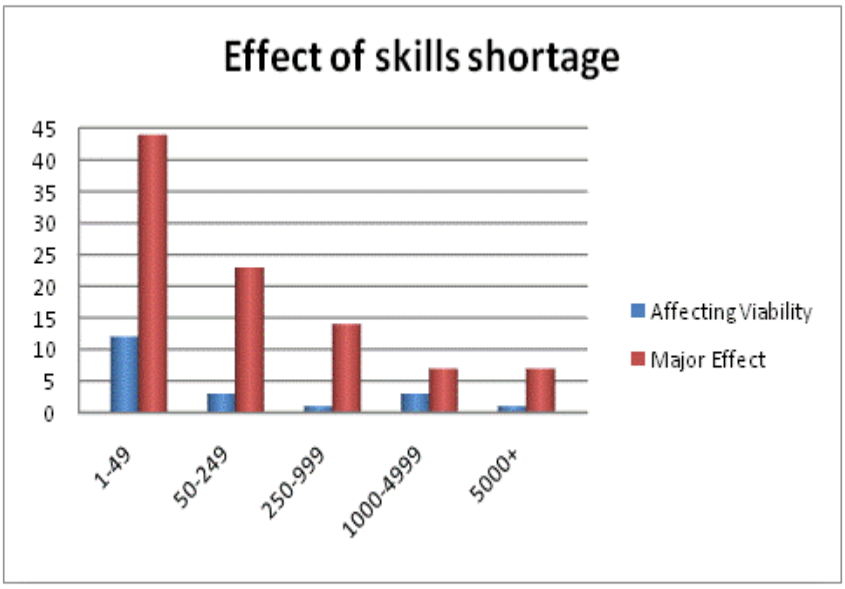
The most dramatic improvement is expected to be in the area of Process management, while the current situation with Programmers and Developers is expected to worsen significantly in the year ahead.

Areas of least concern are Infrastructure Design and Management and Implementation Support.

The survey elicited limited responses to the request for respondents to indicate the top 3 programming languages needed. At the top of the list are **C#, Java and VB.Net**.

Impact of the Skills Shortage

Respondents were asked to rate the effect that the skills shortage is having on their business, ranging from No Effect, to Affecting Viability. Without exception, **ALL respondents indicated that the shortage is having a major effect, or worse.** A not-insignificant few, mostly South African private companies, said that the shortage is affecting the viability of their operations.



The South African economy is in desperate need of accelerated growth, to offset the inflation rate and alleviate poverty. Closing the skills gap in the short to medium term will undoubtedly enable the respondent companies to increase their productivity and stabilise their growth.

Practitioner Responses

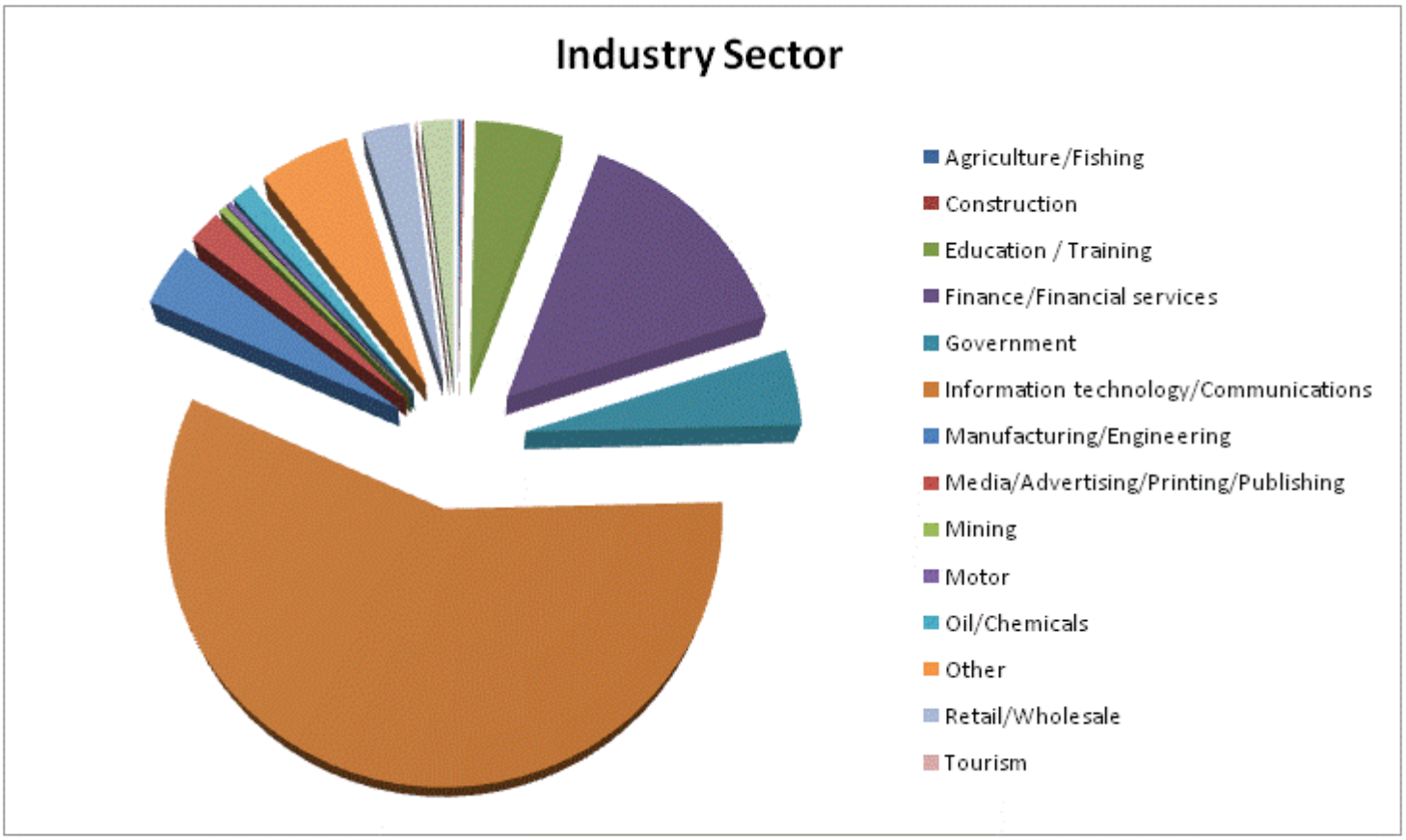
890 valid on line responses were received. A further 75 paper questionnaires were also received. Although the initial target was 1 000 responses, there is no doubt that 965 represents a valid sample.

Practitioner Profile

The "average" respondent is 35, male, living in Gauteng, has been in IT more than 10 years but with their employer for less than 5 years, and is either a manager in a technical role or a developer/programmer.

The overwhelming majority of the respondents are males, between the ages of 26 and 45, living in Gauteng. Over 25% have achieved a tertiary diploma, 16% a tertiary degree and 20% an honours degree or higher. **Over 60% in total are academically qualif**ied.

Western Cape is the home of the second largest group of respondents, with a smaller response from KZN. Northern Cape was the only Province from which no responses were received.



Although 57% of the respondents work in the ICT sector (i.e. for companies or organisations concerned with the creation, distribution, sales and support of ICT products and services), there is also a broad spread of representation from other sectors where ICT products and services are used.

There is a fairly even distribution of the size of companies across the various sectors, with larger employers appearing in the finance/financial services sector. As noted in the Corporate Responses, the size of the "IT department" is usually in proportion to the size of the company, although it appears that the majority of the respondents are either working in a small (1-9) department, or a large one (100+).

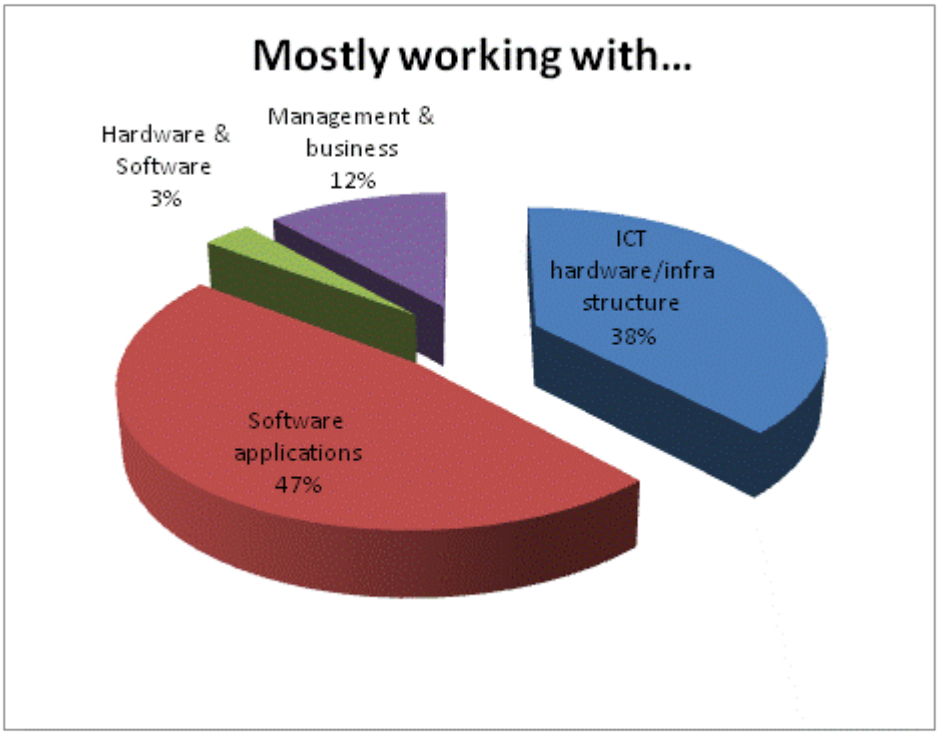
14% of the respondents are working at executive management level, 27% at middle management level. 12% are performing project management roles and 40% are carrying out the broad range of non-managerial practitioner activities.

The following table shows the various lengths of time that the respondents have been in the ICT sector, have served their current employer and have performed their current role.

Years	Less than 1	1-5	6-10	More than 10
In ICT Industry	4%	23%	26%	47%
With Employer	22%	42%	20%	16%
In Current Role	18%	55%	18%	8%

While it can be expected that almost three-quarters of practitioners have spent 5 years or less in their current role, the fact that almost half have spent more than 10 years in the ICT industry suggests that there is **a significant gap in the pool of younger, qualified and experience practitioners**. With almost two-thirds of respondents spending 5 years or less with their current employer, it can be concluded that a significant proportion of employees are moving on, to seek "greener pastures", many of them outside of South Africa.

Practitioner Roles

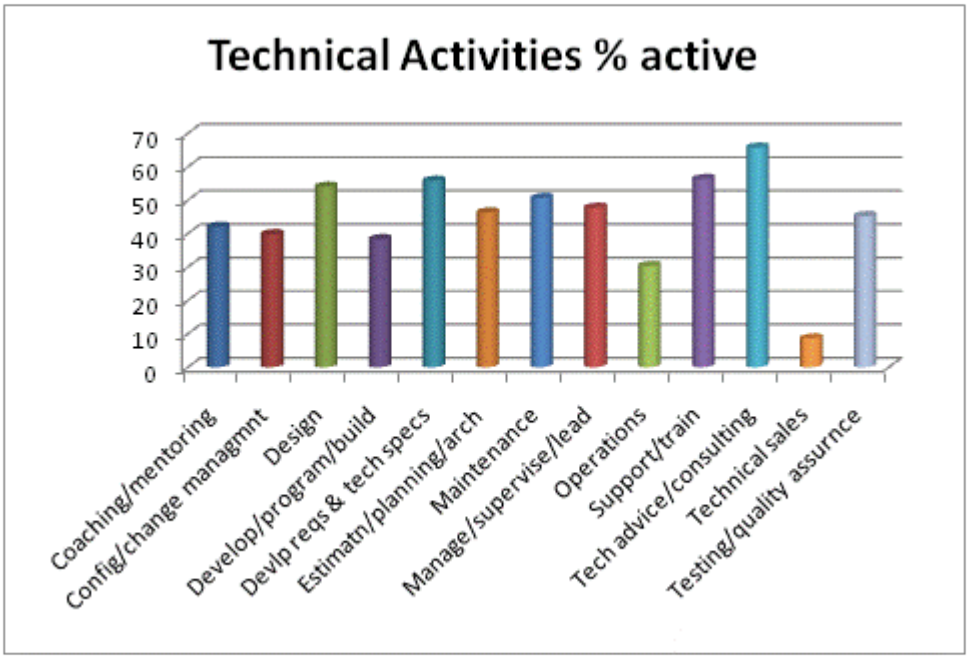


Half of the respondents are involved with software and 41% with hardware and infra-structure. 35% of the latter are working with PCs and Servers and 55% with communications infrastructure.

The remainder are working in non-technical

management and business roles.

One dominant characteristic is that very, very few respondents are focused on a single area of activity. Almost all report that they carry out a range of functions, requiring a range of relevant skills and experience.



On average, each respondent reports being involved in 5 activities.

This raises the question of whether this is a cause or an effect of the skills shortage. It certainly makes the loss of such a practitioner have a greater impact on the operations of the enterprise, and the replacement thereof more difficult.

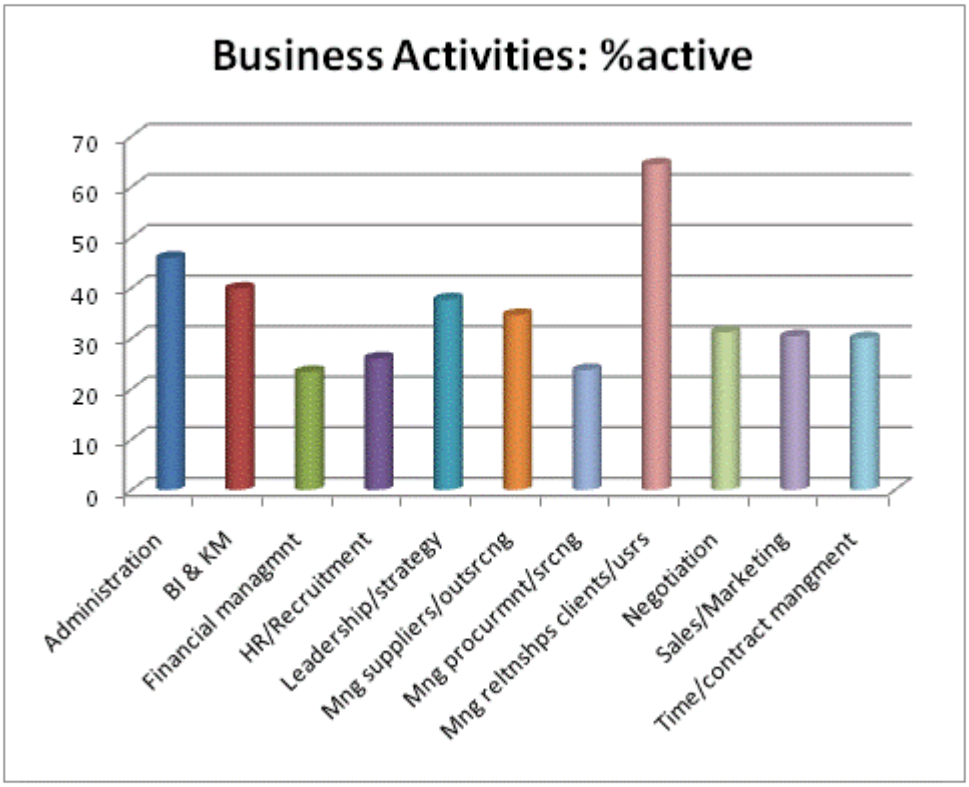
In the technical activities arena, many practitioners report that they are carrying out most of the systems development lifecycle functions, from developing requirements to testing, **suggesting that there is a lack of attention to "governance", through the checks and balances expected from separation of duties.**

Of those involved in technical activities:

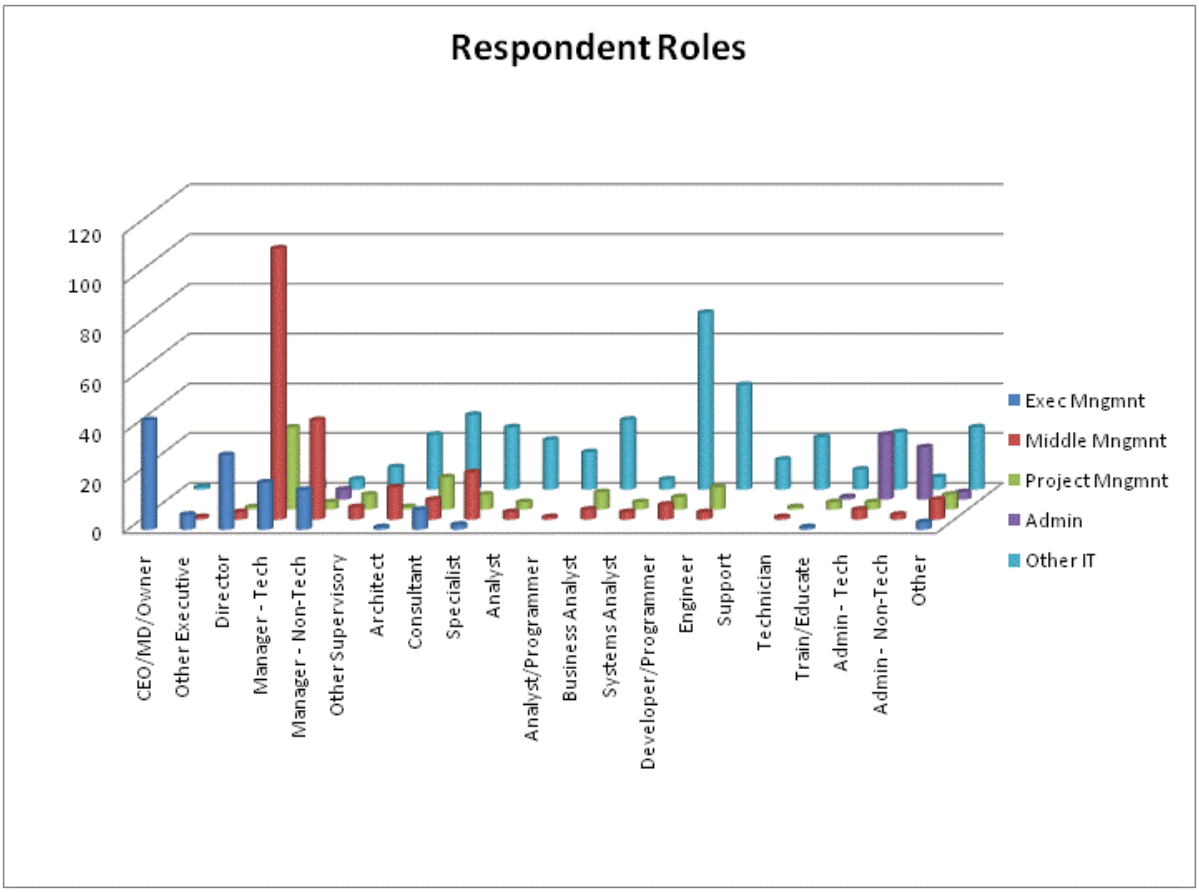
- 66% are providing technical advice and consulting services
- 56% are developing requirements and technical specifications
- 56% are providing support and training
- 54% are designing solutions
- 51% are doing maintenance on existing systems

Of those involved in business activities:

- 64% are managing relationships with clients and users
- 46% are doing administration
- 40% are concerned with Business Intelligence and Knowledge Management
- 38% are involved with leadership and strategy

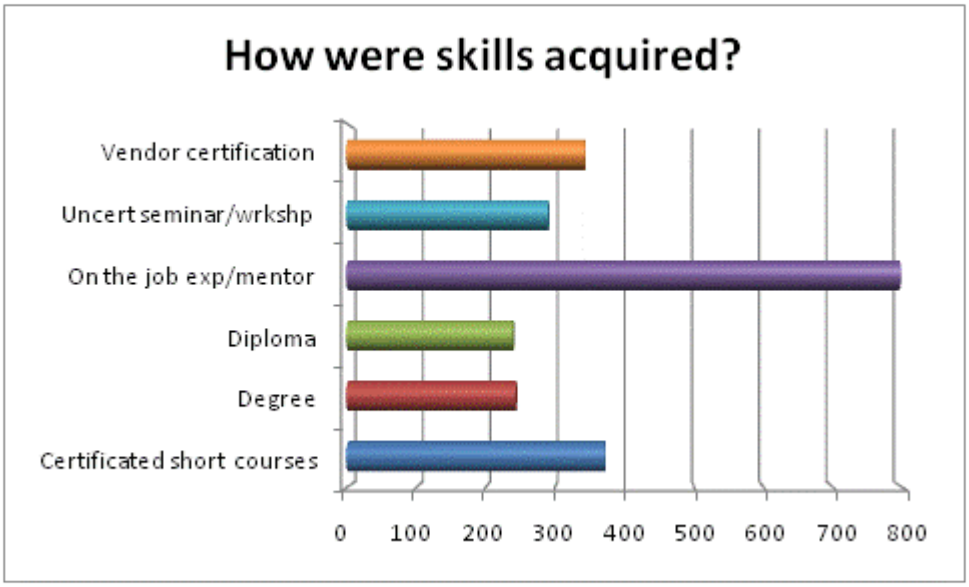


Although there is this strong element of multi-tasking reported by most respondents, an analysis of the job titles supplied indicates that people are hired to perform more traditional, clearly-defined roles. The following chart illustrates this point.



Skills Acquisition

Respondents were asked to indicate how they acquired the skills that they need for their current job.

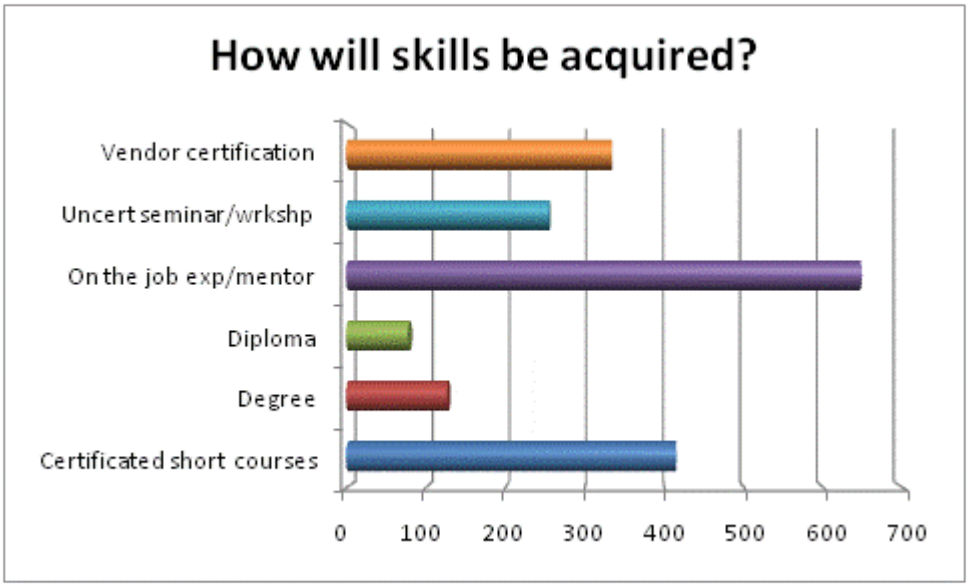


Over 90% show that **on the job experience** or through a mentor was how they acquired their skills.

Certification comes next, reported by around 80% of practitioners, either through a vendor programme or through completing certificated short course training. Both these responses indicate the close relationship between the acquisition of skills and the work environment. It is worth noting that the employers were less enthusiastic about certifications than the employees.

25% each reported that the diploma or degree was sufficient and 30% attended uncertified seminars or workshops to add to their skills.

Looking ahead at what they expected to do in acquiring skills in the next year, on the job experience continues to be the firm favourite, followed by certificated short courses and vendor certifications.



The reasons for this are that such learning interventions require a short-term commitment, minimum time away from the job, skills are

developed as required and there is proof of accomplishment at the end of the course.

By comparison less than 15% will pursue a degree and less than 10% a diploma. Generally, these qualifications are seen as entry requirements and are only pursued once the practitioner is in the world of work if time can be committed and if the academic approach is relevant to the individual's needs.

Respondents showed a preference for **on site** facilitated skills development. Courses are the most popular methodology but there is also strong support for less formal seminars and workshops and, of course, coaching and mentoring. These preferences indicate a desire to spend a minimum of time away from work, while benefitting from a structured and managed learning process. These findings generally support the views of the employers, although they showed a greater preference for coaching and mentoring than did the employees.

For the smaller group that preferred self-regulated learning, knowledge-sharing was the preferred activity, supported by CBT/e-learning. Tapes/videos and books are definitely losing ground to the on line environment.

Where external providers were required, 49% of respondents preferred an academic institution, 46% a vendor and 44% a commercial provider. (Note that many respondents indicated multiple preferences for this question.) This is not strictly reflecting the view of the employers, who preferred the vendor providers, but there is support for all three categories by both groups.

Conclusions

The 2008 ITWeb-JCSE Skills Survey set out to establish **a benchmark** to illustrate the current status of the skills "balance" in the South African ICT sector, and to create a baseline from which trends can be measured during future (annual) surveys.

From this basic data, it is also possible for individual enterprises to conduct the survey across their employee complement and then to benchmark themselves against the broader sector. This service, together with consulting on some more detailed aspects, will be available by arrangement, between the periods of data gathering for the annual survey.

There is no doubt that the ICT sector views the skills shortage as very serious, having a major effect on their ability to carry on business in South Africa. In the globally competitive market, it is vital that more effective ways of combating the shortage are found. The apparent desire to do "more with less", in expecting practitioners to perform multiple roles, may well be worsening the problem rather than alleviating it.

The survey suggests that the "real" skills shortage going into 2009 can be as high as 70 000 practitioners – more than 25% of the current work force. This gap will not be closed by

retention policies or in-work skills development programmes. The solution lies in the industry working together to make ICT careers more attractive to young people, in the education system devoting more resources to a relevant curriculum and in a serious investment in new entrants who will become the lifeblood of a successful and sustainable South African ICT sector.