

2003 Excellence in Practice Award

Technical Training



South African Breweries Limited

Kyalami, South Africa

Holistic In-House Distance-Learning Programme

SUMMARY

The concept of distance learning has been around for over a century. From its inception over a century ago, it has evolved from a concept limited to correspondence courses. The current iteration of distance learning involves not only exciting new modes of delivery but also the developments in instruction based on theories of adult learning. A challenge for modern day designers is to design a more interactive learning environment using creativity in course design and assessment.

In addition to the strengths and weakness found in the current reality of distance learning, designers and facilitators of learning need to be aware of, and responsive to, cultural differences of the learners.

This nomination will show how the distance learning programmes were introduced into the manufacturing function of the company and how such limitations were reduced. It will further show the linkage between these programmes and benefits for the company.

Modern technology has helped to make it logistically possible to conduct business within a corporation that has locations spread out all over the world. Telecommunication and computer development, the uses of satellites and worldwide computer networks have helped to connect people at great distances, speed up the movement of information and communicate quicker and more efficiently.

This new way of doing business has also affected the way training is done in many companies. Rather than fly employees to the home office or a training facility, employees can now receive training in their own plant via satellite, two-way videoconferencing or computer-based training and in addition to the “old-fashioned” correspondence methods.

Although this nomination focuses largely on the correspondence training, it does however incorporate other more modern forms of distance training.

The pedagogical approach to education was the influence affecting distance learning delivery in the past; the instructor imparts knowledge and the learner absorbs, or learns, it. Distance learning consisted mainly of correspondence courses or video courses in which the information was delivered via reading or an instruction imparting knowledge.

The learner would then receive this information via mail or television and respond to it. Some of the challenges facing distance learning in the past included the separation of space and time between the teacher and learner, and between learners and their fellow learners. The time lapse between instruction and the feedback on assignments, the lack of face-to face interaction between learner and teacher, and the lack of socialisation between learners often created the sensation of loneliness for the learner. This lack of socialisation could account for the drop out rate in distance learning classes of over 50% (Rose, 1995).

The current iteration of distance learning is beginning to use principles of androgogy, placing the learner at the centre of learning and the teacher as a facilitator of that learning. The move toward a more interactive type of distance learning curriculum supports this change. Types of interactivity seen in distance learning are not limited to audio and video, or to teacher-learner interactions. It is represented by the connectivity the learners feel with the distance teacher, the local teacher, facilitators and their peers (Sherry, 1996). Without this connectivity, the delivery is little more than that of a correspondence course. It is now possible to achieve this connectivity using appropriate instructional methodologies and the correct systems.

In order to fully understand and implement an effective distance learning experience, the designer and instructor must have a grasp of why adults choose to learn at a distance. Limitations in time, distance from learning institutions, financial constraints and the opportunity to learn from others, which may otherwise be unavailable, are all considerations to heed (Sherry, 1996). Designers and instructors are challenged to develop interactive material because it requires a wide range of skills to do so. Such skills include an awareness of software and audio/video capabilities, a firm grasp of instructional design, and an understanding of the learner (Sims, 1997). One of the more difficult aspects of distance learning is the lack of non-verbal or visual cues. Instructors/facilitators of distance learning have few, if any, of these cues to assist in the delivery of the educational experience. An opportunity found in traditional classrooms, the ability to change or adapt instructional methods and strategies to best meet the needs of a class during instruction, does not exist with distance learning.

In addition to the lack of visual cues, the sense of community, which develops through the socialisation of the learners in a traditional classroom, is lost. Separation by distance affects the rapport of the distance learning class and living in different communities and geographic regions deprives all participants of a common community link (Willis, 1993). As in the past, this separation between learner and instructor remains a concern. Rose (1995) stated that distance is more than a geographic separation. It is a distance of understanding or perception that needs to be overcome by the learner, the instructor, and the educational organisation itself. This physical separation leads to communication gaps that affect understanding.

Another issue in current distance learning is that the technology has progressed at such a fast rate, that many designers are getting involved in instructional design without a firm grasp of the underlying concerns and issues involved. Issues such as learner characteristics and needs, influence of the media on the instructional process, equity of access to the delivery system and role changes of the teacher to facilitator are not being considered (Sherry, 1996).

Although there are many perceived drawbacks to distance education, research has shown that it can be cost effective (commonly believed to be the most cost-effective) and, when appropriately planned, it can be as effective as traditional classroom education (Romiszowski, 1992). Rose (1995) identified that this holds true for traditional lecture approaches, or cognitive gain. However, other measures indicate less growth and development than other educational approaches. The issues identified here are the appropriate identification of the population being studied, and the circumstances surrounding the study. Most distance learners are those in higher education, and they are likely to be more highly motivated. They are also likely to be in a working environment and have to further their learning on a part-time rather than a full-time basis. It is also more related to learners who have to study on a compulsorily basis. This does not imply forced study but rather the need to study to further their career. The final decision as to whether one tackles the compulsory studies is still made voluntarily. Such decisions are normally dependant on how well the individual's development plans have been agreed.

BACKGROUND

About five years ago a careful analysis in the company indicated the need for not only technical but also managerial skills development. A further point that emerged was the need to cater for development on a wide front in many geographical areas. This realisation led to the decision to develop a distance-learning programme.

Analyses were done on learning styles and learning theories utilising Kolb and Honey & Mumford's learning styles questionnaires. These questionnaires differentiate between the various learning styles of adults. Having aggregated the data it showed that the prospective learners had a somewhat integrated learning style that correlated with Kolb's experiential learning model.

Individual needs were diagnosed using competence guides. The systemic data of the company were analysed as was the manufacturing and support strategies. The corroborated results together with a subsequent enviroscan resulted in a needs diagnosis mainly directed by strategy. It was clear that there was a deficit of technical knowledge and skills that manufacturing people needed for work related problem solving. Deeper knowledge of manufacturing equipment, the inherent process, quality and waste aspect as well as the engineering skills related to the equipment stood out as a significant deficiency.

The operational data, often also referred to as systemic data, which was analysed pointed towards the above in that most of the manufacturing units had encountered difficulties in controlling waste, quality and downtime on machinery. It also indicated that the response time to resolve these problems was too long. This is mainly as a lack of hardcore knowledge of the manufacturing processes.

All of this resulted in the development of a distance-learning programme comprised of ten modules. Five modules are technically orientated on equipment and the other five are managerial modules. The learner enrolls for 2 modules each semester, and therefore successful completion of the programme takes two and a half years. Each module is assessed using two assignments and an examination. Typically there is one assignment assessing rote learning whilst the other assesses practical application. The

assignments and the examination can take any form of assessment such as a test, project or even a simulation.

Competence acquisition, after being assessed, has been measured against the learner's competence guide. Every job in the company has a competence guide consisting of a number of unit standards that make up that particular job. Each of the unit standards has a number of specific outcomes that set the minimum standard for that particular aspect of the job. Against the specific outcomes there are assessment criteria that are used to assess the individual competence. These competence guides also form the foundation for curriculum design.

The programme commenced in 1998 with a pilot group of 6 learners. Due to the success of the programme the following semester saw an influx of learners. The programme has now grown to include 129 learners with 49 graduates. In addition, the success of the programme resulted in two other distance learning programmes being developed to cater for a lower and a higher level. At the lower end a Certificate Programme and at the higher end a Bachelor Degree was instituted.

The main reasons for the influx of learners were:

- Nationally accredited formal qualifications that would give the learner the necessary entry-level qualifications for higher positions in the company.
- Distance learning – the cost to company was minimal compared to having to transport delegates to a central point.
- It was business focussed and contained subject matter with which learners were comfortable as it was part of their job.
- Although within prescribed timeframes, the learning was learner paced.

It is clear that there is a correlation between a well-designed distance learning training programme and cost savings, improved efficiencies, improved quality and employee effectiveness. In the case of the group that was used to establish these benefits, the training cost was less than R1 million but generated savings/improvement of more R10 million. These cost savings are based on one or two examples per learner rather than every possible benefit extrapolated from the programme. It can therefore conservatively be assumed that the cost savings are more than the number stated.

Thus, the connection between a well designed distance learning programme and reduced costs, improved efficiency and effectiveness is attractive for the company, considering that with a wide geographical spread, travel and accommodation costs alone would be higher than the total distance learning cost. To achieve the same cost saving using classroom training would probably constitute a programme covering a few weeks. Considering the time away from work, the development cost of such a programme, as well as travel and accommodation it is clear that the distance learning option is very cost effective.

DOCUMENTATION

Needs Identification

1. *Describe the problem or need for which this practice is designed and implemented. How was this problem identified, and how was it determined that this practice is an appropriate response?*

As stated earlier, the needs diagnoses were done using a holistic approach in four steps namely: strategic analysis, environmental analysis (internal and external), systemic analysis and finally individual needs analysis.

At the strategic level the business and manufacturing strategies were analysed. These clearly pointed to key focus areas around quality, waste and equipment reliability. These key focus areas were either as a result of poor performance or due to new technology becoming available.

On the environmental front, there were certain legislative issues highlighted that could have a significant impact on process control to ensure compliance with legislative requirements.

Thirdly, the systemic data of the manufacturing function were analysed in depth. This data pointed to low efficiencies, poor machine reliability, poor quality and high waste in various areas. The key systemic data that needed improvement included:

- Factory efficiencies varied between 60 and 70% in the different plants with the divisional efficiency being 68%. This against a target of 72%.
- The Integrated Quality Measurement System (IQMS), which measures total compounded quality of the finished product, varied between 80 and 90% against a target of 95%.
- Container loss divisionally averaged 1,89%, which represents a monetary loss of approximately R20 million per annum.

The results were corroborated with the strategic and environmental analyses and indicated a high correlation for in-depth training on equipment, problem-solving techniques to resolve the focus issues as well as comprehensive managerial training. Good understanding of financial and “just-in-time” principles is examples of the shortcomings.

The human resource data indicated that there were poor cover ratios and succession depth at Packaging Manager and Unit Manager level and that there was not enough staff development taking place to ensure that the situation improves. The cover ratios for all managerial position are reported for < 6 months, 6 –12 months, 12 – 24 months and > 24 months. The ratios for Packaging and Unit Manager were 0.10, 0.15, 0.20, 0.4 and 0.24, 0.28, 0,08, 0.30 respectively. The business requirement is a compounded number of above 2.00. The business need was to have a programme in place to improve these cover ratios and succession depth rather than simply relying on external appointments to achieve the desired results.

Finally, individual diagnostic assessments were done to establish whether the focus areas were as a result of competence or performance gaps. The Brinkerhoff model was applied throughout the programme with the individual needs analysis being stage 1. Each individual needs analysis was done against the job competence guide. Although there were performance related gaps, it was evident that the majority of the gaps were competence related. The biggest gap was in deep technical process knowledge and the

ability to use the knowledge to problem solve the focus areas and put corrective actions in place as well as systems and procedures to prevent problems recurring.

In summary, the agreed objectives for the programme were to:

- Improve factory efficiencies.
- Improve quality results
- Improve waste aspects in high leverage areas such as container breakage
- Improve cover ratios at Packaging and Unit Manager level.

This holistic analysis indicated the need for a comprehensive drive to uplift the knowledge and skills in terms of manufacturing systems and processes as well as deeper machine knowledge and problem solving ethic.

Apart from the holistic needs, which clearly supported identified business and individual needs, a series of consultative processes were engaged to establish the best method of delivery of the anticipated programmes. With the company being geographically decentralised there was an overwhelming response from senior management to pursue the distance-learning route on a pilot basis. A learner was nominated from each of the seven geographically dispersed centres for the first six-months (or two modules) of the programme to pilot the distance-learning method of delivery.

The pilot proved very successful and drew the interest from other potential learners. The distance-learning format was so attractive that without further advertising of the programme, the learner numbers grew exponentially over the past five years to total 129 learners. (80 current and 49 graduates at time of writing this paper)

At every functional forum (that is held every three to four months) a regular items on the agenda was utilised to communicate the progress and findings as well as to solicit potential improvements to the programme itself, the mode of delivery or improved assessment methods.

Design Values

2. *Please describe how this practice takes into account the best interests of both the organisation and the employees targeted.*

The distance-learning programmes have been formally registered on the National Qualifications Framework. This ensured that the implementation of the training intervention is in the best interest of the employees targeted, by providing these employees with not only enhanced competence but also a nationally recognised diploma (Diploma in Packaging Management) followed by a further year of study, which resulted in the learner being awarded a Bachelor of Technology in Management (BTech) degree. The degree is also national registered at a higher education level.

Completion of the programme certainly provided the learners with confidence as evidenced by successful efforts to reduce downtime and waste, improve quality results as well as interaction in problem solving sessions. The learners were also able to coach their respective team members as a result of their own competence acquisition. The training resulted in many of the learners being tasked with formal problem solving activities as a result of their newly gained expertise. This happened either during or after a module. Thus informal training in the shape of coaching and mentoring resulted in a

multiplier effect. The net result ended in positive implications for problem solving, morale, team building, and for subsequent career development which had spin-offs in human resource cover ratios from 0,85 to 3,40.

The organisation gained from improved problem solving activities resulting in reduced machine downtime, reduced waste (or manufacturing and process sundries), improved quality, and reduced manufacturing unit cost. The net result of these improvements amounted to more than R30 million cost saving or output improvement. These improvements against a total training cost of less than R3 million over the past five years.

Other benefits to the company were improved standards and procedures relating to equipment process control. In one case the practical assignment highlighted a line design problem, which was rectified and incorporated into future line design concepts. In addition there has been a huge improvement in intellectual capital resulting in improved cover ratios with nationally recognised tertiary qualifications.

With the programme being modular and running over a period of three and a half years, it was structured to focus on the highest leverage areas in the technical arena first. The highest benefit areas were thus covered in the first modules. After the first year the training was expanded to focus on both the technical as well as the managerial concepts. The Bachelor of Technology (BTech) portion of the programme focuses mainly on managerial concepts namely Business Strategy Management, Operations Management, Financial Management and Research Methodology.

The Research Methodology module comprises of a practical research in the form of a thesis, which is used as a summative assessment of the learner. The research the learner does is agreed with the learners' manager to ensure that value can be extrapolated out of the research efforts.

Alignment

3. *How is this practice in alignment with the performance identified, as described in your answer to question 1?*

Stage 2 of the Brinkerhoff model was used as a guide. The total structure of the programme was designed and implemented based on the needs analysis ensuring that the curricula content was completely relevant and aligned with the identified needs. This was done with the help of technical expert colleagues and partners. The instructional design process took into consideration that it is not only the lack of knowledge that needed to be covered but also skills. In this aspect the programme and especially the assessment design ensured that both these areas were covered. With each module having two assignments, the focus of the one assignment was on rote learning whilst the other assignment focused on actual problems being experience in the plants and the skills to solve these.

With respect to learning transfer, the fact that the practice was based upon a proper needs diagnosis, which includes strategic, systemic and individual diagnosis, resulted in proper development plans constructed for every learner. These development plans were agreed between the learners and their respective managers ensuring that they are fully aligned with not only the individual needs but also with the organisational goals.

The learners learning styles were analysed using Kolb's Learning Styles questionnaire. This questionnaire is useful in identifying the particular target audience's style of learning. This analysis assisted in ensuring that the distance-learning concept would work. The dominant learning style was an integrated experiential learning style developed by Kolb. This necessitated proper alignment of the instructional design process to meet the learning styles. Having said this, the integrated experiential learning made it easier as it shows no dominance to a particular style but rather a smoothed effect towards all four Kolb's learning styles namely convergent, divergent, assimilation and accommodative.

The company has an entrenched culture of performance management, which includes customer-focussed goals and performance reviews against these goals. Indicators of success are included in the goals against which performance is measured. In all cases the individual development plans formed part of the learners goals for the respective period. There was thus buy-in to the process from both the learner as well as his/her manager. The latter point essentially created commitment from both learner and manager, which in turn assisted with transference of knowledge and skills.

The assessments of every module were designed such that they drive continuous improvement practices, which are aligned with the company's continuous improvement drive embarked upon several years ago - where teams are empowered to identify and solve problems autonomously. The assessments that were done during the course of a module were aimed at sampling problem areas, analysing them and making corrective action based on the theoretical knowledge gained. In certain cases the practical type assessments were agreed with the factory's departmental heads to assist in designing learning situations that would create benefit against the organisational goals.

Outcomes related performance objectives existed, involving the application of Bloom's taxonomy (viz. Evaluation, synthesis, analysis, application, comprehension and knowledge level). This approach often aided problem solving and diagnostic skills development. The instructional design was 'best practice' ensuring that outcomes were achieved.

4. *Please describe how this practice integrates other training, learning and performance improvement practices, and aligns itself with organisational goals to achieve the desired outcomes.*

The structure of the company is such that every functional area in the technical arena has a technical manager, which is the head of department (HOD) of that function at the company's head office. The HOD is the sapiential leader for the function and defines the strategic direction for the function in collaboration with the Board of Directors and in line with the business strategy. From the inception of the programme each functional HOD has been involved in a series of discussions to ensure total alignment to the business and functional strategies.

The functional strategy focuses not only on the technical aspect of the business but also on the human resource aspects in conjunction with human resource and training & development. The main focus areas of the functional strategy are:

- New product development
- Manufacturing Line Performance enhanced

- New technology researched and integrated
- Quality performance enhanced
- Waste reduction
- Material long term cost reduction e.g. light weighting
- Strategic People Resourcing and People Balance Sheet management.

The programme design was focussed on key strategic issues to ensure the functions' short and medium term goals are achieved. The HOD's provided additional support towards the programme in the form functional expertise within their departments at the company's corporate technical centre in head office.

On a systems level, the company introduced the SAP system that makes the capturing of learning and assessment relatively easy. Results and trends can easily be accessed and analysed.

A strategic alliance was formed with a tertiary educator for the provision of some of the managerial modules as well as the BTech portion of the programme. Careful consideration was given to the choice of subjects and lecturers to ensure strategic alliance and fit with the company's image, ethos and culture. These modules were further supplemented with input and support from the subject matter experts within the company (such as having the Financial Manager lecturing on issues such as Economic Value Added (EVA) and Activity Based Costing (ABC) etc).

Therefore the programme was suitably designed to ensure total alignment with the respective issues discussed above. The design not only took into consideration the company and individual development needs but also good instructional design principles as well as systems and procedures to drive proper development and record keeping.

In addition, the programme design and philosophy applied has served as a model and internal benchmark for other HRD functions within the organisation. The model and philosophy is now incorporated into several other functions in the organisation.

Evaluation Strategy

5. What evidence is there of partnerships within and outside the organisation?

The evaluation methodology basically followed the steps outlined in R Brinkerhoff's evaluation model.

At stage 1 the needs diagnosis is describe above, as was stage 2 on programme design. In the needs diagnosis strategy, environmental (internal and external) factors, systemic data as well as individual needs diagnoses were taken in consideration. In the programme design, outcomes based training formed the basis with well-developed objectives (outcomes) based on Bloom's taxonomy.

Stage 3 evaluation measures whether the learner has appreciated the learning opportunity and whether the material measures up to what was expected. This evaluation was done in three dimensions namely course content, course outcomes and benefits and facilitator efficacy. The reaction questionnaire uses a rating scale from 1 to

5 (with 1 being poor and 5 excellent). There were 2 out of 48 learners that assigned a score of 2 to the entire questionnaire and that happens to be in the area whether distance learning is a suitable method of delivery. This category scored the lowest with an average of just below 4. Albeit the lowest category it can still be concluded that a score of nearly 4 is good enough to substantiate the use of distance education as appropriate. Ignoring the two low scores, the rest of the target audience scored the use of distance education as excellent. The course design scored an average of 4,13 and the facilitator score an average of 4,11. The highest average score was 4,26 attributed to the course outcomes and benefits. On the question "to what degree would you recommend this programme to others" the average score was 4,43.

During the programme the learners had to do two assignments per module. In all cases there is an approximate 50/50 split between assessing for knowledge and then the application thereof (stage 4). On average, the knowledge component scored about 70 – 80% whilst the application component scored between 65 and 75%. At the end of each module there is an examination (assessment) that consisted of tests, projects or problems to be solved. The application type assignments and examinations gave an indication as to how often the learners used their gained knowledge (stage 5). Feedback from the learners' managers supported this. Comments are invited from the learners' managers during every module and in some cases the managers are involved in setting specific assignments.

The question of whether or not the training delivered any dividends (stage 6) tends to be slightly more difficult to isolate independent variables that might have impacted on the results (be it positive or negative). In all cases the known independent variables were noted and explained. Issues such as material usage, change of material supplier, improved maintenance practices or the replacement of machine parts were some of the independent variables that were identified and isolated. To establish the HRD's contribution, a technique developed by Jack Phillip was used to assign a percentage to the contribution. The contribution was assigned by the learners and agreed by their managers. In cases where there were known independent variables the HRD contribution was reduced even further to ensure that if the results are skewed, that it is defensible since it could only be higher.

The systems results also showed an increase in overall competence in the functional area (from 34% to 78%). These results are directly obtainable from the organisations computer system SAP (the competence gained as measured against the individuals' competence guide).

Furthermore correlation analyses were conducted between the manufacturing results of the various units and the increase in competence as a result of the training efforts. The correlations varied from very high 0,99 to fairly low 0,09 with an average of 0,65. To establish the reasons for the variations the Jack Phillips technique was applied again. This isolated independent variables such as major breakdowns where the correlation was low. Where the correlation was high, there was a positive contribution made by the increased competence of staff.

The General Managers and Packaging Managers of each plant were asked to identify the reason for their improved and/or sustained performance. The General Managers concluded that 38% of the improvements could be attributed to the increased

competence. This correlated well with the view of the Packaging Managers who attributed 40% to increased competence.

The indication from this corroborated analysis shows a return on investment payback in excess of R30 million versus a training cost of less than R3 million. In the training cost all costs of development and delivery were included in determining the learner fees amortised over three years. Since the programme is in its sixth year of running all development costs have already been recuperated.

Results

Quantitative and qualitative data is collected and used to measure performance indicators in several business areas such as cover ratios, percentage competence, factory efficiency, IQMS and several waste aspects. This is in direct alignment with both the programme and organisational objectives. Trend, anomaly and delta analyses reveal short and long term impact whilst correlation analysis indicate the relation between competence gained and performance factors.

This section will focus mainly on the results achieved by learners who have completed the entire programme. They were all part of the pilot and then first intake of learners that started in August 1998 and February 1999 and completed their final research in February 2002. The results they have achieved from their research module and subsequent implementation of their recommendations, which drew heavily on their knowledge and skills gained in the early part of their programme on the technical modules.

6. *How is this practice evaluated? What factors are included in your calculations (e.g. time, costs, staff count, lost phone calls, customer satisfaction)? Are the financial costs of this practice calculated? If so, how? How often is this practice evaluated?*

The organisation has a very active Strategic People Resourcing (SPR) strategy, which aims to attract, develop and retain high potential people. Cover ratios and succession depth are measured at all levels of the organisation. The result is a very comprehensive People Balance Sheet (PBS) indicating tenure of current jobholders as well as potential cover for that particular position. The potential cover as well as tenure is reported in < 6 months, 6 to 12 months, 12 to 24 months and > 24 months.

Many of the learners appear, as a direct result of the completion of their Diploma and BTech, on the PBS as potential cover for the next level up as well as potential for technical consulting in the company's head office.

Nine graduates have been promoted since the completion of the programme. The positions into which they were promoted have also been updated in terms of minimum entry-level criteria to include the Diploma/BTech combination as part of the entry qualification for these functional positions. The benefits of these promotions as well as the change in entry-level qualifications for certain jobs have had major spin-off for both the company and individuals. Individuals now feel that they are being appropriately recognised for their effort whilst the company enjoys higher staff morale and commitment.

One learner, who started off as an artisan in the company some 15 years ago (and who was promoted), commented that the distance learning programmes has changed his life forever. He had no promotional prospects prior to his enrolment on the programme and as he puts it “the sky is now my only limit”.

All graduates have been awarded the formal qualifications, which are also transportable throughout the industry and wider. Their skills and ability to do research based problem solving has been improved significantly as will become apparent in the benefits gained for the organisation. Thus their ability to assist team members with problem solving (creating a multiplier effect), speaks for itself.

The following 4 paragraphs is an edited abstract from an awards evening at the company’s prestigious annual manufacturing conference:

“One plants’ development manager was the first manufacturing employee to win the company’s coveted John Seton Award.”

“The award, which is made for exceptional innovation, was presented to the learner at the recent company conference by the company’s managing director.”

“The learner won the award for work he did as part of his research project described earlier, where he significantly improved machine capability through various technical innovations including the development of a new vent tube which resulted in a reduction in waste and material on the a manufacturing line, a move which saved the plant R5-million in F03.”

“The plant’s general manager says the value and relevance of the learners’ work is outstanding and the breakthrough he achieved on machine optimisation has been issued as a shared learning through the Knowledge Management process and is currently being considered by most other manufacturing units.”

7. *What specific participant behaviours are observed as a result of this practice, and how do these behaviours contribute to the goals of the practice? Are the impacts of these behaviours short-term or long-term? How do these behaviours differ from the results of previous practices?*

From an organisational point of view the introduction of the distance learning programmes has resulted in an explosion of interest to get enrolled. This has led to creating an effective learning organisation and a willingness to share information, knowledge and skills freely. The growth in training days over the past few years has been phenomenal from 2308 days in financial year 1999 to 12,409 in financial year 2003.

The distance learning training days are based on twenty learning days per module, which was calculated from the notional hours of the relevant subjects.

The objectives of the programme as identified under Q1 and the resultant impact on these include:

- Improved cover ratios at Packaging and Unit Manager level.

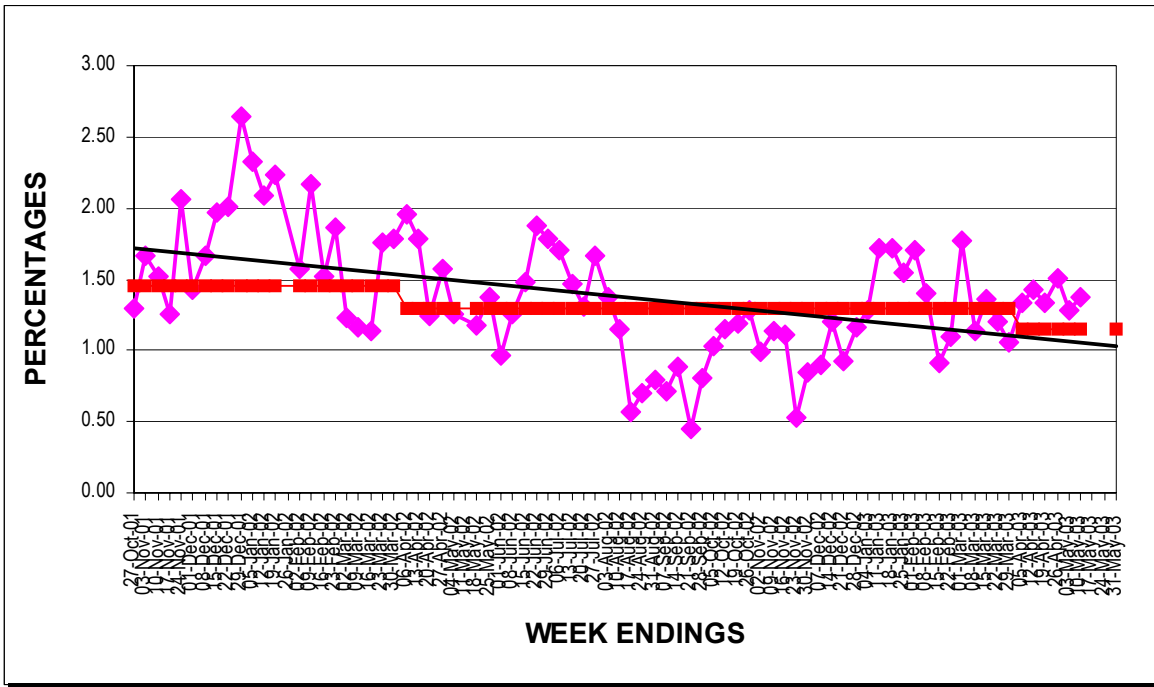
The improvement in cover ratios and succession depth is also an organisational benefit as described in the previous section under question 6. The cover ratio for Packaging Managers has increased from 0.10, 0.15, 0.20, and 0.4 to 0.95, 0.60, 0,85 and 1.00. Compounded it increased from 0.85 to 3.40, which is higher than the company's compounded target of 2.00. The graduates from the distance learning programmes constitute 55% of this cover.

- Improved waste aspects in high leverage areas such as container breakage

The financial results for the company are significant. Per example three learners did their research together in identifying the dependent and independent variables and its correlation to a specific material loss problem namely container loss. The container loss problem in question is one of the largest loss areas within not only this organisation but also in similar organisations. Their findings pointed them in the correct direction and they then drew on the technical skills and knowledge gained from the programmes to resolve the issues. Their recommendations/corrective actions were implemented in one area at a time with immediate reduction in losses (from 2,10% to 0,85%).

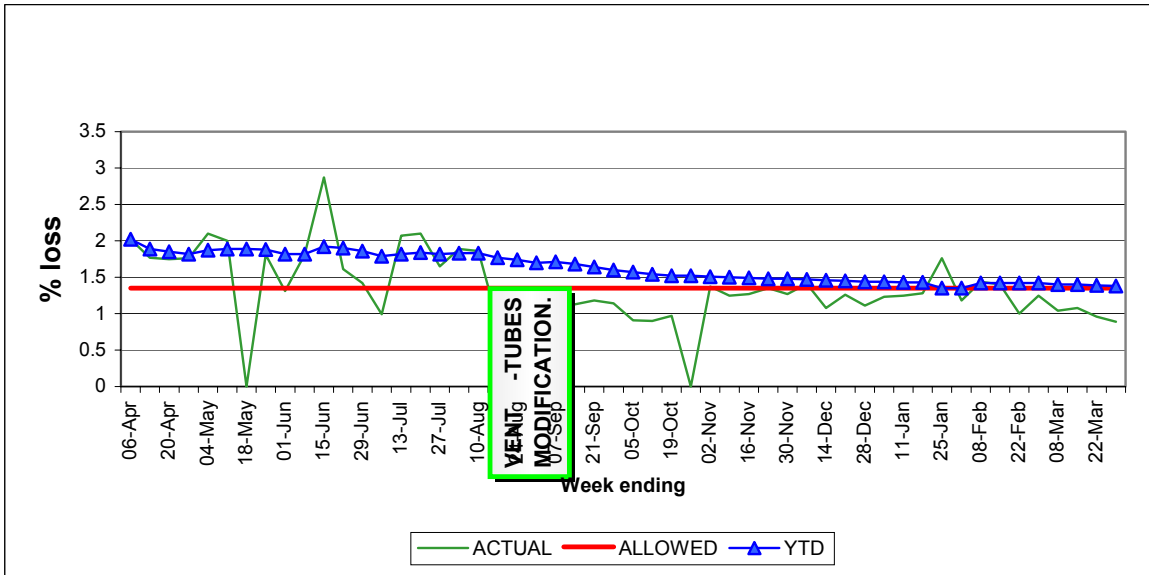
These improvements have been sustained since then as can be seen from the attached graphs. In the first manufacturing plant the losses reduced from approximately 1,80% down to 1.05%. This represents 1,5 million containers per annum saving versus the previous period. With the cost per container being R1,25 the saving amounted to R1,8 million. The graph below shows the improvements as well as the target line that has been reduced twice since.

As can be seen from the graph below there have been short-term as well as long-term benefits. These results achieved have been sustained for a number of months now.



The learning from this plant was repeated in another plant. The container loss in the second plant was reduced from about 1,75% to 1,00% resulting in an approximate saving of R1, 2 million. The graph below show the improvement realised in the second plant. The learning from this research has also been posted on the company's knowledge management system.

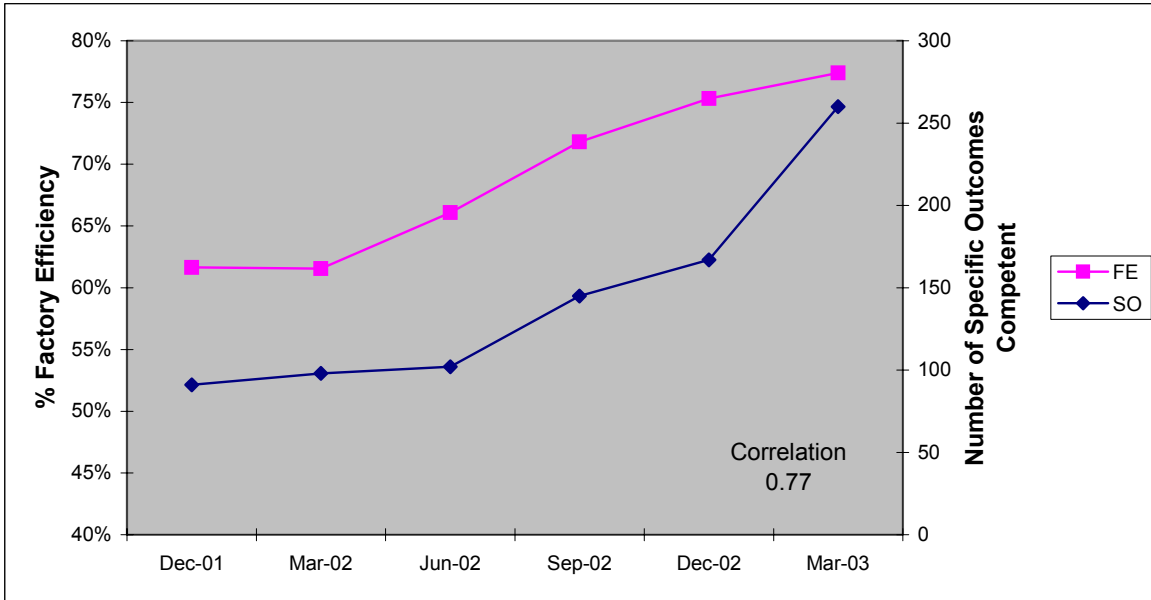
Also, in the graph below it is clear that there are short and long term benefits from the programme. As with the graph above these improvements have been sustained for a number of months.



- Improved factory efficiencies.

The aggregate factory efficiency of the company has improved drastically and more pleasing to note is that these increases have been sustained over a period of time now. For example, the graph below shows the improvement in competence in one plant as well as the improvement in factory efficiency. This plant has improved its efficiency from 62% to 78% whilst competence measured against specific outcomes has increased from 100 to 270 over the past 18 months.

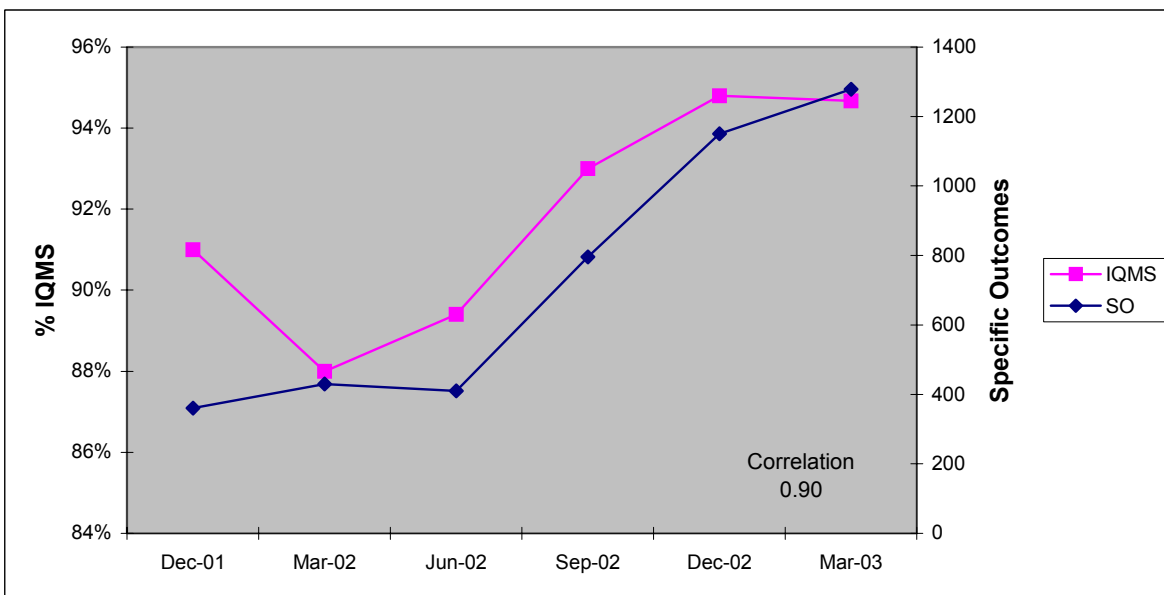
The correlation between competence and performance in this plant is 0.77 as indicated on the graph. The percentage HRD factor attributed to the improvements in this specific plant has been adjudged by the plant management at 25%.



- Improved quality results

The improvement in quality has also been significant. As example (this time in another plant) the IQMS score improved from 90% to 95%. This represents a significant improvement in the quality of the company's products. However, such improvements are more difficult to quantify in monetary terms.

The graph below depicts the improvement in IQMS against the increase in competence as well the correlation. The percentage HRD factor attributed to the improvements in this specific plant has been adjudged by the plant management at 40%.



The benefits thus linked directly to the programme and the objectives set at the outset can thus clearly be seen. These results are just a few of the benefits that have been realised. Some of the other benefits that are attributed to the programme are summarised in the table below:

Learner	Cost of Training	Actual Wastage & Material savings	Areas of improvement	X HRD % Factor	Monetary Benefit from Training
Learner JL	6,400	143,940	Reduced losses	70%	100,758
Learner CK	6,400	296,400	Reduced material and improve efficacy	55%	163,020
Learner VM	6,400	50,000	Local manufacture	30%	15,000
Learner MdK	6,400	226,200	Product losses improved	60%	135,720
Learner PE	9,600	30,000	Time efficiency	100%	30,000
Learner AvR	6,400	71,208	Reduced utilities	30%	21,362
Learner LL	9,600	469,252	Glass loss	5%	23,463
Learner JC	6,400	91,039	Training	100%	91,039
Learner CG	3,200	11,088	Efficiency and material improvement	100%	11,088
Learner MS	3,200	354,288	Overtime savings	50%	177,144
Learner SM	3,200	192,000	Reduced waste	15%	28,800
Learner MdM	3,200	165,663	Time management	70%	115,964
Learner WB	6,400	203,471	Waste and quick change-over technology	80%	162,777
Learner RN	9,600	46,757	Reduced stock holding	80%	37,405
Learner TN	12,800	1,300,000	Improved waste	30%	360,000
Learner JM	6,400	14,951,638	Improved efficacy	2%	299,032
Learner AIR	6,400	16,000	Training and coaching	100%	16,000
Learner DD	6,400	395,148	Reduced leadtime	40%	158,059
Learner LJ	6,400	648,000	Raw material waste	90%	583,200
Learner CBS	12,800	35,317	Manpower utilisation	65%	22,956
Learner MT	12,800	81,355	Waste reduction	50%	40,678
Learner AN	16,000	536,400	Waste reduction	80%	536,400
Learner RT	16,000	831,600	Improved efficiency	20%	166,320
Learner FJvV	6,400	11,989	Raw material waste	90%	10,790
Learner RN	6,400	600,000	Delayed capital expenditure	50%	300,000
Learner EvdM	6,400	7,560	Training & coaching	100%	7,560
Learner KK	16,000	432,000	Time and problem solving	65%	280,800
Learner SP	34,000	6,500,000	Waste reduction	70%	4,550,000
	251,600				8,445,335

The percentage HRD factor is a conservative estimation of the contribution that HRD has made in the contribution/improvement based on the Jack Phillip model. As mentioned earlier the cost of training is the total cost for development and facilitation of the programme amortised over three years. The cost per module is then calculated.

The knowledge and skills transfer on these distance-learning modules over a six-month period is better than the transfer of knowledge and skills in a one week classroom session at a higher cost basis than the distance learning modules. It is therefore apparent that the distance learning option in comparison with classroom training is a more attractive option for the company.

Shared Learning

8. *What was the impact of the practice on your organisation? Are the impacts of these behaviours short-term or long-term? (Where possible please include actual figures related to the practice.)*
9. *What have been some of the specific lessons learned from designing and implementing this practice for the purposes of continuous internal improvement? Please discuss whether and how this practice might be transferred and replicated both internally and externally to your organisation.*

From the start of the programme there have being a number of learnings. The main learnings are as follows:

- A properly designed distance-learning course can add value to the bottom line of the organisation. It is essential that the instructional design of the programme makes provision for transference of learning and that application of knowledge takes place.
- Curriculum design is of utmost importance to ensure that the content being trained correlates with the high impact learning opportunities and addresses the gaps identified in the needs diagnosis on a just-in-time basis. The more comprehensive the needs diagnosis the easier it is to align the curricula to suit a wider audience. It also poses a particular difficulty when there are many manufacturing sites with varying types or makes of equipment.
- The curriculum of the course has been adapted a number of times now as new learnings become available and, whereas, the diploma started off as an eight module course over two years it is now a ten modules course over two and a half years. At first there were six technical and two managerial modules. The technical modules have now been combined into 5 modules and the managerial modules have been extended to five modules to make it a more comprehensive development programme.
- A holistic approach to performance improvement in a technical environment (addressing not only technical knowledge but also managerial knowledge as well as skills) yields greater business results.
- High quality course material, a conducive environment and good technical and management practices are an economically viable development offering with performance benefits that far outweigh any cost of implementing it.
- With respect to transferability the programme lends itself to complete transferability within common industries. Where the industries differ slightly or even vastly the managerial modules will stay common and the industry specific modules would be substituted with modules from that industry with relative ease. The programme is currently, within this country, a nationally recognised diploma that is transportable within the industry.
- The programme has been rolled out to the organisations' subsidiaries with great success as well. In addition the programme is also available to any other company in the same manufacturing environment.

- Within the company the diploma has now been used to model two other initiatives on in different disciplines. It will be used as a basis of instructional design principles for two other distance learning programmes to be launched. The managerial modules will be utilised as it's been designed whilst the technical modules will be substituted with discipline specific modules. It is thus only necessary to develop the technical modules.
- The external provider with which the organisation has had a relationship for the provision of some or part modules has also applied the philosophy to a number of their clients. Regular visits to our organisation have been entertained over the past five years to share the learnings from the practice. Some of these visits resulted in organisations replicating the practice and asking for consultation time to assist them.
- This practice offers external practitioners an opportunity to apply these successful techniques or the overall program, with small adjustments, within their own organizations, regardless of the type of job function involved.
- Another learning, which also is a benefit of the programme, is the contribution it has made towards the intellectual

- depth of the organisation in this discipline specific. In addition to that is the improvement in cover ratio at lower, middle and even senior management levels.
- A comprehensive evaluation strategy provided important feedback to not only the programme administrators but also to the delegates, management and the company at large. Most training practitioners are reluctant to do evaluation, as was the writer. However after these exercises the learning has been phenomenal and the results and cooperation from the function equally so.

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