



# ArcelorMittal Dofasco

## Measuring the Impact of Essential Skills Training

**AUTHORS:**  
**Lynette Gillis, Ph.D.**  
**Allan Bailey**  
**Dawn Campbell-Borland**



# Case Study

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# CASE STUDY

# Investing in People®

*“There is a difference between returns from training investment and the effectiveness of training. The effectiveness of training investment addresses the issue of what ROI could have been attained, as opposed to what ROI was actually attained. This involves a comparison of the calculated ROI and the potential ROI. In general, actual ROI will be less than potential ROI. The divergence between calculated ROI and potential ROI is an indication of the lost opportunities for improving performance.”*

**Enterprise Return on a Training Investment**

**NATIONAL CENTRE FOR VOCATIONAL RESEARCH (2000)**

(Australia)

## **AUTHORS**

Lynette Gillis, Ph.D., CTD; & Allan Bailey

**Centre for Learning Impact**

(Formerly, Learning Designs Online)

[lgillis@cfl.ca](mailto:lgillis@cfl.ca)

[abailey@cfl.ca](mailto:abailey@cfl.ca)

t.905.823.3367

f. 905.823.1675

Centre for Learning  
The logo for the Centre for Learning Impact features the word "impact" in a teal, lowercase, sans-serif font. To the left of the word "impact" are three concentric, light teal circles that resemble ripples in water.

## CASE STUDY

# ArcelorMittal Dofasco

## Measuring the Impact of Essential Skills Training

**Overview** ArcelorMittal Dofasco, one of the most successful steel operations in North America, produces a range of products from hot rolled coils to steel tubes for customers in the automotive, construction, manufacturing, and packaging industries. Each of ArcelorMittal's 5,000 Hamilton-based employees is part of a pro-active corporate culture—known as the Dofasco Way—which has been the company's driving force since its founding in 1912.

Since the 1990s the Hamilton operations have followed the industry-wide shift to increased use of efficient, computer-based manufacturing to enhance productivity and remain competitive in the global steel industry. Since 1990 ArcelorMittal's (Dofasco's) attrition has remained low and the company's productivity has increased 50%—about twice the rate of the Canadian manufacturing sector.

### Rationale for Essential Skills Training

This strategic move to more intensive reliance on computer technology has created an ongoing need to upskill its workforce, many of whom are long-term employees, some with secondary school education or less. ArcelorMittal is committed to providing educational/upskilling opportunities to its existing workforce in preference to simply acquiring new employees with the necessary skills and expertise.

Moreover, Dofasco's organizational philosophy supports the view that it is incumbent upon the organization to provide learning opportunities—in particular such essential skills as literacy, numeracy, and computer awareness—for their existing employees to give them the necessary competencies to be the best contributors they can be. They hope to enhance the employee's contribution not only at work, but also at home and in the community at large.

**Lynette Gillis Ph. D**  
**Allan Bailey**  
**Dawn Campbell Borland**  
**CENTRE FOR LEARNING IMPACT**

### Basic Computer Skills Course

To support this philosophy, the company implemented an Essential Skills training program in 1997 designed to foster lifelong learning. The program uses a "pull" versus "push" strategy to engage the company's business units and employees—as such, participation is voluntary and confidential. If employees commit to training, the company pays for 50% of their time in training. The program is delivered through a four-way partnership that includes the employees, the company's HR department, workplace teams and community providers of Essential Skills training. The HR department coordinates the program, community providers assess workplace needs and provide instruction, and employees volunteer 50% of their time.

The recent adoption of GPS inventory management and other upcoming suites of computer-based manufacturing technologies has, in the last few years, placed an increasing focus on courses such as the *Basic Computer Skills* training. This course is designed to increase employees' overall comfort level with technology and computers. *Basic Computer Skills* also strives to provide hands-on experience in using computer applications and packages, to enhance participants' technological vocabulary and keyboarding skills, and to use computers as a means of further developing more general communication skills.

In their current job roles, some course participants may use computers for such tasks as looking up parts, creating or accessing work orders, scheduling, maintaining records, emailing, doing payroll, dispatching, or using Excel spreadsheets. Some may also use the company's specialized enterprise-wide software systems: Tracess and Tesys.

A key business objective of implementing *Basic Computer Skills* has been to ensure that the organization gets the maximum benefits as they continue to introduce new productivity-enhancing manufacturing technologies such as GPS into the workplace. This objective will best be attained if all employees have the foundational computer skills to use the new technologies and leverage the productivity potential they offer.

This impact analysis was specifically intended to evaluate how the *Basic Computer Skills* training contributed to the overall business performance improvements (productivity contribution) resulting from the introduction of the GPS technology in the Slab Handling and Storage facilities. Typically, such analyses seek to establish links between improved Capability, Transfer to the job, and business performance improvement. This linkage is evaluated using the Learning Value Chain™ evaluation tools and business performance records as well as techniques to isolate the specific contribution of the training from other factors that also influenced business outcomes.

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### The Training **Basic Computer Skills**

**Target Audience:** The *Basic Computer Skills* course is offered on a voluntary basis to all employees including those working in the Slab Handling and Storage facilities. Current classes include employees holding a variety of job positions: mechanics, technicians, crane operators, millwrights, transportation, etc. Participants' education might range from those who have not completed high school to college and university graduates.

**Format:** Courses are instructor-led and conducted onsite in computer classrooms. The courses are scheduled one evening a week for 2 hours for 12 weeks. Courses are

voluntary, not mandated.

**Content:** The course content includes such topics as: use of email, digital cameras, USBs, file management, Windows Basics, net searching and troubleshooting, PowerPoint, Excel, hardware, and digital video.

**Activities:** Class activities included individual practice activities, small group activities and activity worksheets.

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**The Case Study  
Methodology**

## THE LEARNING VALUE CHAIN™

The *Investing in People™* (IIP) case studies adopt the Gillis and Bailey concept of the Learning Value Chain™ as a general framework for evaluating the learning effectiveness and the business value of training and human resource investments (Figure 1).

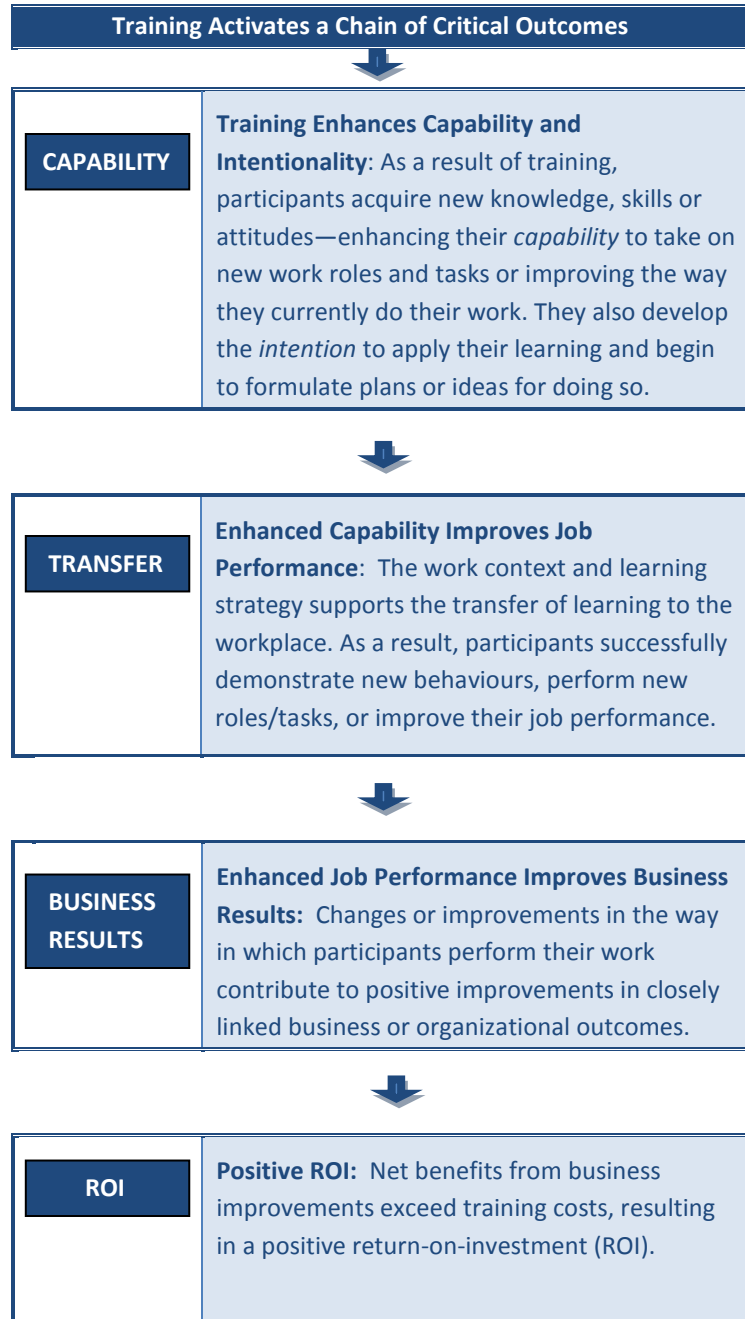
In the Learning Value Chain™, the training program triggers a chain of critical outcomes. As desired outcomes are achieved at each link along the chain, greater value is added and the likelihood increases that training will result in positive business outcomes and return on investment. Conversely, if training fails to meet outcomes at any link, value is diminished and the prospect of positive business results and return on investment is at risk.

Using the Learning Value Chain Methodology™, the training program is evaluated at each of four links (Capability, Transfer, Business Results and ROI). At each link, data is gathered to assess the extent to which the training has achieved key outcomes, added value and enabled the next critical event in the chain to occur.

The Learning Value Chain™ model also incorporates a diagnostic strategy to investigate training practices and strategies that may strengthen or weaken outcomes at each link and subsequently influence business impact and return on investment.

Figure 1

### The Learning Value Chain™



**CAPABILITY RESULTS**



**Evaluation Questions:** Did training participants develop new *capability*: acquire new knowledge and skills, adopt new attitudes, improve existing skills, or discover new and more productive ways of doing work? Did participants also develop the *intention* to apply their learning or improve their job performance?

To assess Capability—the first link in the Learning Value Chain™—all participants were asked to complete the Capability Questionnaire (CQ) at the end of their 12-week training. Fifteen of 22 participants completed questionnaires, resulting in a good response rate of 68%.

*Results suggest that Basic Computer Skills training succeeds in enhancing skill level and confidence to a high degree in half of participants. All participants are motivated to apply their learning, and about half report well-developed plans for doing so.*

Key questionnaire results are summarized in the Capability Index (at right).

- **Skills & Knowledge:** Before training, only 13% rate their knowledge and skill level as 'high' across seven key areas of learning. After training 52% rate their skills and knowledge level as 'high;' 44% rate their skill level as 'average,' and only 4% rate it as 'low' (down from 61% who rated their skills and knowledge as 'low' prior to training). Learning gains are consistent across all areas of learning, but greatest in 'using Microsoft Office' software.
- **Confidence in Applying Learning:** 51% report a 'high' level of confidence in applying their learning to their jobs; an additional 46% report 'moderate' confidence.
- **Perceived Value:** Participants virtually unanimously rated the training's "credibility", "practicality", "relevance" and its "necessity" as 'high.'
- **Motivation:** 100% of respondents report that they are highly motivated to apply their learning to their jobs.

**Capability Index**

**Impact at a Glance**

**Red** Low (1 & 2)  
**Yellow** MODERATE (3)  
**Green** HIGH (4 & 5)

(5-POINT SCALE)

N=15

SKILLS & KNOWLEDGE



CONFIDENCE



PERCEIVED VALUE



MOTIVATION



PLANS FOR ACTION



RISK ALERTS	
	<b>SKILLS AND KNOWLEDGE:</b> ALMOST HALF (48%) REPORT A LOW TO MODERATE LEVEL OF KNOWLEDGE AND SKILL FOLLOWING TRAINING.
	<b>CONFIDENCE:</b> ALMOST HALF (49%) REPORT A LOW TO MODERATE LEVEL OF CONFIDENCE IN THEIR ABILITY TO APPLY THEIR LEARNING ON THE JOB.
	<b>PLANS FOR ACTION:</b> ALMOST HALF (47%) REPORT ONLY MODERATELY DEVELOPED PLANS TO APPLY THEIR LEARNING.

- **Plans for Action:** 53% report that they have developed plans for applying their learning to a 'great' or 'very great' extent. 47% report a 'moderate' level of planning.

**Risk Alert for Transfer** As indicated by the red flags in the Risk Alert box of the Capability Index, almost half of respondents rate their knowledge and skill level as 'low' to 'moderate' following training. Similarly, approximately half report 'low' to 'moderate' confidence in their ability to apply their learning to their jobs.

About half report they have not done a 'high' degree of planning with regard to how they plan to apply their learning. Taken together, the findings suggest a risk for the transfer of learning to the job and subsequent performance enhancement.

**Effective Practices** The overall instructional quality of the *Basic Computer Skills* course was rated very highly: 97% of all participants rated the course 'effective' or 'very effective' across six key aspects of instructional quality.

Using the Effective Practices Audit the following strategies and practices are identified by participants as having contributed positively to their learning:

- Adjusting participants' work schedules to allow them to attend training
- Support from the classroom tutor
- Individual practice activities
- Small group practice activities
- Help from peers
- Using activity worksheets
- Instructor-led training delivery

#### Safe Learning Environment

Interviews with those involved with the program cited other effective practices. For example, the onsite training is seen to provide a "safe learning atmosphere where all learners are at the same level." If employees take similar courses at a nearby college, they are sometimes uncomfortable in classes where students have a broader range of computer knowledge and expertise.

#### Graduation Ceremony and High Profile Champion

The Graduation Ceremony held for *Basic Computer Skills* participants is also seen to be a unique feature of the program—and a highly effective practice. Participants often attend the ceremony with their family and take great pride in presenting their projects and receiving recognition for their learning accomplishments. According to managers, having a high profile management Champion who supports the program and is visible at all graduation ceremonies is also seen to contribute to the program's success.



**TRANSFER RESULTS**



**Evaluation Questions:** Did the work environment and learning strategy support the transfer of learning to the job? Did training participants apply their learning to their jobs, and did the application of learning impact their work or job performance?

To assess Transfer—the second link in the Learning Value Chain™—training participants completed the Transfer Questionnaire (TQ) approximately two to three months following their computer skills training. Nine of 22 participants completed the questionnaire resulting in a response rate of 41%.

*About half of those trained transferred skills to the job. Findings suggest that about half of the group were able to apply their learning in their workplace situations and improve their performance on computer-related job tasks.*

The Transfer Index (at right), summarizes key results:

- **Learning Application:** 46% of participants report that they have applied the skills learned in their training to a 'high' degree; 17% report a 'moderate' level of application; and 37% report a 'low' level.

More detailed analysis of this finding reveals that the highest level of learning application occurs in the areas of: “using the Internet,” “Dofasco Intranet,” “email,” and “using proper keyboarding techniques.”

Only one-third of participants are applying their learning to a high degree in: “using Microsoft Office software,” “using the computer for problem solving,” and “using the computer for making presentations.”

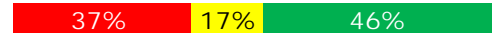
- **Performance Improvement:** 65% of respondents report a 'high' level of improvement across seven areas of job tasks; 24% report 'moderate' improvement; and 11% report a 'low' level of improvement.

**Transfer Index**

Transfer at a Glance	
<b>Red</b>	Low (1 & 2)
<b>Yellow</b>	MODERATE (3)
<b>Green</b>	HIGH (4 & 5)
(5-POINT SCALE)	

N=9

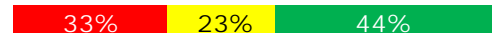
LEARNING APPLICATION



PERFORMANCE IMPROVEMENT



WORKPLACE READINESS



**TRANSFER ALERTS**

- LEARNING APPLICATION:** MORE THAN HALF (54%) REPORT A LOW TO MODERATE LEVEL OF LEARNING APPLICATION.
- WORKPLACE READINESS:** MORE THAN HALF (56%) REPORT THAT IT IS NOT POSSIBLE TO APPLY LEARNING IN THEIR SPECIFIC SITUATIONS.

**BARRIERS**

- 'LACK OF RELEVANT SITUATIONS TO APPLY MY NEW LEARNING' OR 'CONTENT NOT APPLICABLE IN THE WORK SITUATION' WERE THE MOST FREQUENTLY CITED BARRIERS TO LEARNING APPLICATION.

Further analysis reveals that improvement is greatest in the areas of “using Traccess (enterprise software)” (87%), “using email” (87%), and “using the Internet” and “Dofasco Intranet” (75%). Improvement is much less in other areas: “using Tesys (enterprise software system),” “Excel” or “PowerPoint”.

- **Workplace Readiness:** 44% report that it is possible to apply their learning to a 'high' degree in their specific work situation or circumstances (i.e., have time, manager’s support, resources, opportunity). 23% report that learning can be applied to a 'moderate' degree in their work circumstance, while 33% report a 'low' degree of workplace readiness.

Note: “Learning Application” ratings reflect participants’ application of specific computer skills learned in the course—some of which did not transfer to the job. “Performance Improvement” ratings reflect improvement in the broader application of technology for job tasks.

#### Other Job Impacts

In addition to improving performance in specific computer-related tasks, findings also suggest that the *Basic Computer Skills* course succeeds in increasing employees’ overall comfort level with technology in general, not just computers.

- 100% report that they are now more eager to learn new computer technology.
- 75% report that they are now more confident in using new technology.
- 71% report that they are now quicker to pick up new technology or updates to software used in their units.
- 63% report being able to apply their skills and knowledge more effectively and better navigate different technology.

Several participants remarked in their open-ended comments on the confidence they gained from taking the course:

*"The Essential Skills program helped in ways of making me feel confident in navigating my way through the computer. I also gained keyboarding skills and a basic understanding of how a computer works."*

*"This has given me the added confidence to move on in the organization."*

The coaches and managers of the course participants observed other important outcomes such as improved teamwork and communications.

They also noted that course participants learn more about other work areas in the company from their classmates and tend to develop a willingness to help one another that transcends the classroom.

**Risk Alert for Business Improvement** The first red flag in the Risk Alerts box of the Transfer Index draws attention to the finding that, following computer skills training, a large proportion of participants fail to apply their learning.

The second red flag suggests that, for a sizable proportion of trainees, learning transfer is not feasible in their specific workplace situation or circumstances. They cite 'lack of relevant situations' or 'lack of applicability of the content' as the greatest barriers to learning application and performance improvement.

Given that approximately half of those trained are not in a workplace situation to fully use their training, this signals a potential risk to business impact.

**Effective Practices to Enable Transfer** The following practices were cited most frequently by respondents on the Transfer Questionnaire as having aided the transfer of learning to their jobs:

- Having a sufficient level of knowledge and skill (cited by 75% of respondents)
- Information, reference materials, tools, or job aids (63%)
- Adequate motivation or incentive (63%)
- Support from manager or supervisor (63%).

**Barriers** The greatest barriers to learning application included:

- Lack relevant situations or opportunities to apply my new learning (33%)
  - Content not applicable in my work situation (22%).
-

## BUSINESS RESULTS



**Evaluation Questions:** *Did the application of learning or improvements to job performance impact business results? What were the intangible benefits from the training?*

## BUSINESS MEASURES

As indicated previously, the goal of this study has been to evaluate how much the *Basic Computer Skills* training contributed to the overall business performance improvements resulting from implementing GPS locator technology in the Slab Handling and Storage area.

As a result of efficiencies realized in the Slab Handling area, ArcelorMittal estimates a total annual cost savings of \$500,000. The savings come primarily because the automated equipment precisely locates the locations of all steel slabs in the inventory storage yard. This eliminates the requirement for the inventory team to include a full-time inspector (to physically check the accuracy of storage location records). Eliminating the need for an inspector on every team results in one less full time employee (FTE) per shift 24/7, 52 weeks per year.

ROI not obtainable

For a number of reasons, however, this analysis was unable to unambiguously apportion the component of the *Basic Computer Skills* training's contribution to the overall GPS business performance improvements with an acceptable level of confidence. As a result of unanticipated participant and scheduling changes, the training cohort evaluated for this study contained an insufficient number of Slab Handling and Storage employees to enable this analysis to draw reliable conclusions about the training's overall contribution to improved productivity. As a result, precise business benefits and return on training investment could not be quantified.

## PERCEIVED BUSINESS BENEFITS

Although exact business performance outcomes linked to the training were not attainable, examination of the earlier links in the Learning Value Chain™ strongly suggest that the training positively impacted business outcomes. Participants' responses to the Transfer Questionnaire suggest a favourable trend. 100% of those responding report that since taking the *Basic Computer Skills* course:

- The quality of their work has improved.
- They have been able to save time by using the computer.
- They work better with their unit or team.
- They are able to prevent accidents.
- They are more satisfied in their jobs.

In addition, 87% report that they have been able to lower production or other costs; 86% claim to make fewer errors in their work.

One participant commented on how his improved computer skills helped him become proficient in his new role as a team leader more quickly:

"I was already pretty good with a computer but the knowledge I acquired through the Essential Skills program helped me to grasp the Team Leader role more easily."

Participants' managers also perceived business benefits. One manager observed that previous to offering the courses, there was a shortage of dispatchers. Now that more employees are computer literate, there are fewer situations of dispatcher shortages.

### TRAINING COSTS

Although this analysis will not develop the business impact of the training or the return on investment, it is nevertheless instructive to recognize the cost of the training to the organization and to the employee (since employees are paid only for 50% of their time in the classroom). A complete appreciation of the full cost to the organization of this training pilot—in this instance largely participants' time (opportunity cost)—will yield invaluable insight for the next design iteration of the *Basic Computer Skills* program.

#### Company Cost

(Company investment)

Skills Pre-assessment Cost: \$4,400 (\$200 per participant X 22 participants)

Facilitator costs: \$1,800

Participant salary (Loaded, Hourly): \$25.89 X 30% (benefits) = \$33.66

Participant salary costs:

= \$33.66/hour X 12 sessions X 2 hours X 0.5 (company share) X 22 participants

= \$8,886

Total training investment: **\$15,086**

Per participant cost to organization: **\$686**

#### Participant Cost

Note: Participants are paid only for 50% of their time in training (12 hours per course). This analysis assumes, therefore, that participants' investment is equivalent to the value of foregone wages (12 hours X \$33.66/hour), or the time they attend Basic Computer Skills training without their customary compensation.

\$33.66/hour X 12 sessions X 2 hours X 0.5 (participant's share) = **\$404**

## INTANGIBLE BENEFITS

### Social ROI

Perhaps one of the most profound and lasting benefits of the *Basic Computer Skills* program is its impact on many of the employees and their families. Participants and others at ArcelorMittal who have been involved with the *Basic Computer Skills* program over the years report that many of the steelworkers—especially those in their late 40's and 50's—had no previous exposure to computers and the online world. Some participants, for example, described their personal goals to improve their computer skills in order to email their grandchildren, to surf the internet, or to book trips. Some, as a result of the course, purchased computers for the first time; others now apply the computer skills they acquired in home businesses.

One senior program Champion observed that the *Basic Computer Skills* course has demonstrated its value in employee morale and engagement:

*"The return on investment for us is somebody who comes to work with pride in their company—more pride in what they are doing. They have a feeling that they are contributing more. At the end of the day, it's pretty hard to put a dollar value on that."*

### Employee ROI

Several participants and senior managers pointed out that it was important to consider the personal returns to individual employees from the *Basic Computer Skills* training. Specifically, managers pointed out that employees who otherwise lack the educational background may become eligible for promotion to the position of Training Lead as a result of the essential skills training.

**Hypothetical Personal ROI** It is instructive to consider the hypothetical personal ROI—the ROI a participant might realize as a result of attending *Basic Computer Skills* training and becoming more eligible for promotion as a Team Leader as a consequence. This hypothetical example assumes an Equipment Operator receives a promotion after attending four *Basic Computer Skills* sessions.

Personal benefit: The financial benefit for an employee resulting from a promotion from Equipment Operator to Team Leader is an increase in wages and benefits from \$33.66 to \$38.16 per hour (\$4.50 per hour). Considering the employee's investment in training time as equivalent to his or her fully loaded wage (\$33.66 per hour), the cost of attending one course (12 sessions) equates to a personal investment of \$404 (see 'Training Costs' above). Assume that four such courses are required to enable an employee to be eligible for promotion to shift supervisor.

Therefore, Personal ROI could be calculated:

Total cost to employee: \$1,616 (\$404/course x 4 courses)

Total Benefit to Employee: \$8,640  
 (\$4.50/hour X 8 hours per day X 240 workdays/year)

$$\text{Personal ROI (Hypothetical)} : \frac{\text{Total Benefits} - \text{Total Costs}}{\text{Total Costs}} = \frac{\$8,640 - \$1,616}{\$1,616} = 435\%^{1,2}$$

<sup>1</sup> (Note this hypothetical example is conducted only for illustrative purposes and is not a formal component of this analysis. It should be noted, too, that this calculation of personal ROI assumes that taking four computer skills courses would be sufficient to enable an employee's promotion.

<sup>2</sup> This means that every 'equivalent dollar' employees invest in their computer skills upgrading is returned along with an additional 'profit' of \$4.35. Also, it should be noted that the ROI estimated here accounts for only the first year of benefit following the promotion. This is consistent with the conservative principles of the Phillips ROI Methodology<sup>TM</sup> In practice of course, financial benefit will continue to accrue in subsequent years.)

### CONCLUSION

The results of this impact analysis suggest that the *Basic Computer Skills* course is succeeding in accomplishing a principal goal for the company: enhancing employees' general confidence in using computers—and technology in general. As the company moves through a critical period of transitioning to more computer-intensive industry, the results provide strong indication that—as a result of this training—employees are willingly and successfully retraining to adapt to their new work environment and job demands.

Participants report that they are more eager to learn new technology, quicker to pick up new technology, and able to navigate new systems more effectively. Moreover, they see great value in the training, are highly motivated to apply their learning, and take great pride in their achievements. They see benefits—not only in their work lives—but in their personal lives as well. 100% of those who responded to questionnaires are in agreement that the training has enhanced their job satisfaction.

There is also evidence that this enhanced comfort with technology is improving work performance. Almost two-thirds (65%) report that they have improved their performance in key job skills—especially in such areas as using the company's computer systems (Traccess, email, Intranet).

Respondents to the Transfer Questionnaire (though response rate was low) were unanimous in their belief that the *Basic Computer Skills* was also impacting business measures. They perceive the greatest impacts in: improving the quality of their work, time-savings, preventing accidents, enhancing teamwork, and improving job satisfaction. There is also suggestion that enhancing the computer literacy of employees has enlarged the applicant pool for key positions like 'dispatcher.'

Both employees and their managers also report wide-ranging intangible impacts to employee engagement, morale, and company pride.

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**ISSUE: Training Alignment**

*Training not directly aligned to current and future job roles*

Although course participants describe improvements in areas of their work performance, the results indicate that some of their learning from the *Basic Computer Skills* course is not being applied to a significant degree. One-third of survey respondents, for example, report finding little opportunity in their work to apply their newly acquired skills in using Microsoft Office or to use the computer for problem solving or making presentations. In addition, program developers indicate that the program has been designed more as a 'generic' computer skills awareness package rather than to address specific workplace technology requirements.

This is further corroborated by the 'Workplace Readiness' finding that more than half of the group (56%) report that it's not possible to apply their learning to a high degree in their specific work situation or circumstances (i.e., have time, managers' support, resources, opportunity). When asked to identify the greatest barriers to learning, they cite: 'lack of relevant situations to apply my new learning' or 'content not applicable in the work situation.'

Finally, since the *Basic Computer Skills* training is offered as a voluntary option, there is little to guarantee that training targets the appropriate audience—those workers who will benefit most or those most likely to require enhanced computer skills in their current and future job roles.

**RECOMMENDATION: Revisit Training Alignment**

*Recommendation: Consider Directly Aligning Training Content to Current and Future Job Needs*

In light of the findings cited above, it's recommended that the content of the *Basic Computer Skills* course be reviewed to assess its alignment to current job needs. According to instructors, the course content has not undergone sufficient revision in a number of years; however, in recent years there has been increasingly rapid growth in the use of technology and computer-based systems throughout ArcelorMittal and unprecedented change in job roles and skill requirements. Some adjustments to the content of the *Basic Computer Skills* course may be needed to more accurately reflect the needs of the new workplace and ensure greater applicability of the skills learned.

**AUTHORS: Lynette Gillis, Ph.D. & Allan Bailey**  
**Centre for Learning Impact**  
[lgillis@cfl.ca](mailto:lgillis@cfl.ca)  
[abailey@cfl.ca](mailto:abailey@cfl.ca)  
t.905.823.3367    f. 905.823.16  
[www.cfia.ca](http://www.cfia.ca)

