



Case Study **March 2005**

Building Essential Skills in the Workplace Shaping Performance at BHP Billiton Diamonds Inc.

OVERVIEW

BHP Billiton Diamonds Inc., operator of Canada's first diamond mine, is committed to building a sustainable Aboriginal and northern workforce. BHP Billiton developed its essential skills training program (hereinafter referred to as the Workplace Learning Program) based on a combination of circumstances, namely, Impacts and Benefits Agreement requirements, dedicated hiring practices favouring Aboriginal workers, lower literacy levels in the Northwest Territories (NWT), and socio-economic agreements signed with the Government of the NWT in 1996. In these agreements, the company committed itself to providing local and community benefits by hiring significant numbers of northerners (defined as permanent residents of the NWT) and northern Aboriginal peoples.

BHP Billiton Diamonds Inc. employs 900 people, with most employees working at its remote Ekati Diamond mine site. Located approximately 300 kilometres north-east of Yellowknife, this new mine operates 24 hours a day, 365 days a year. The main work rotation is two weeks in, two weeks out, with 12-hour shifts each day.

The Education and Learning case studies examine outstanding education and lifelong learning programs and initiatives. This case study addresses best practices in developing essential skills in the workplace.

Name of Program
Workplace Learning Program

Date Established
1999

Skills Developed

Reading text
Document use
Numeracy
Oral communication

Contact

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Workers at the Ekati diamond mine site work a 12-hour shift for 14 days straight, followed by two weeks off. When they are working their 14-day shift, workers live on-site, spending all of their time in close proximity to their co-workers. The only access to the camp is by airplane.

The company gives hiring preference to Aboriginal northerners and other NWT residents who have the required skills. It sets a hiring target of 62 per cent for northern residents and, within that target, 31 per cent for northern Aboriginals.

The northern and Aboriginal labour force from which the mine draws its workers presents several skills-related challenges: a population with a strong oral, rather than written, culture; workers with little or negative experience with schooling; and, for many of the workers, Ekati is their first formal workplace. While incoming workers are “good with their hands” and have good critical thinking and problem-solving skills, academic skills (such as using numbers and documents) have often not been a priority for new recruits and are frequently lacking. As a result, company management was aware that the literacy skills of the workforce could be low. Newly hired workers’ skills and education ranged from the level of beginning readers and writers to high school graduation equivalency and apprenticeships. To address the need among some for literacy skills upgrading, the company initiated a Workplace Learning Program (WLP) once a full-time workforce was in place at the new mine.

OBJECTIVES

BHP Billiton Diamonds established the WLP to satisfy corporate production and safety needs, as well as the learning goals of individual workers. The WLP aims to:

- maintain and improve safety in the planning and execution of all work activities; and
- offer upgrading to learners of all levels (through literacy skills upgrading, pre-trades training and apprenticeship preparation, instruction and support for workers wishing to complete high school) and access to correspondence courses.

The company addresses five essential skills, identified as such by Human Resources and Skills Development Canada (HRSDC). The company places a heavy emphasis on document use, reading, writing, working with others and oral communication. Because employees live and work in close quarters at a remote site that does not enable access to and egress from the site during their two-week work terms, employees need to get along with co-workers and supervisors, practicing good communication and conflict resolution skills.

BHP Billiton considers the five essential skills described above as “need to have.” It designates four other skills—problem solving, critical thinking, numeracy and computer use—as “nice to have.” Problem solving and critical thinking are often embedded in reading and writing exercises.

TARGET GROUPS

The company began its essential skills training by putting on regular classes and structured programs. The WLP is a resource for all workers who wish to upgrade their skills, including BHP Billiton employees and contractors. Workers who benefit from the program range from non-readers and non-writers to those wanting to complete high school, enter a trade or successfully complete their trades training, and they constitute the program’s primary target audience.

Buoyed by the success of its core essential skills program, BHP Billiton continued to canvass the skill needs of its employees through surveys, informal feedback, and crew talks with workers, team leaders and supervisors. These consultations resulted in the expansion of essential skills training from the original core offerings to optional workshops targeting all workers. Examples of optional workshops include money management (reading a pay stub) and starting a small business. And an exciting new addition offered by the company is an oral Dogrib language class.

As BHP Billiton enlarges its target group and learning offerings, the company envisages offering its essential skills programming at a “community level” within the mine, reaching general mine employees as well as temporary and permanent contractors through a kind of learning centre.

ACTIVITIES

The Workplace Learning Program at BHP Billiton is built on an assessment of key jobs using HRSDC's essential skills job-profiling methodology.

At the Ekati mine site, this methodology was used to profile the essential skills of four crucial jobs in 1999. These jobs are Process Plant Operations Assistant, Maintenance Helper, Heavy Equipment Operator, and Warehouse Technician.

Use of this methodology involves identifying tasks typically performed by workers in different roles and collecting examples of documents used in the workplace. Generally, once tasks and documents have been identified and collected, the skill requirements of different jobs are specified according to scales developed for the Statistics Canada's International Adult Literacy Survey. The next step in assessing skill gaps is testing the current skill levels of employees and new recruits.

BHP Billiton adult educators crafted a four-point scale for rating essential skill levels based on the needs of the workforce at Ekati. A skill level of 1 corresponded with "easy"; a skill level of 4 corresponded with "difficult."

The WLP develops skills through many learning delivery methods and activities. After an assessment of an individual's workplace literacy skills, a customized curriculum targeted at developing specific skills is designed for that worker. Typically in module format, the curriculum includes learning objectives, measure mastery and completion, and use of authentic work documents and resource materials.

WLP adult educators are responsible for designing a relevant and useful curriculum. To that end, they shadow workers in their jobs, on their equipment, and in the field to see how and where literacy and essential skills are used on the job (for example, document use and logbook entries). Their diligence and "hands-on" approach to curriculum design help the company and the workers get what they need out of their investments in learning.

Mining Diamonds in the North

BHP Billiton uses a wide range of unique technologies to mine diamonds from the permafrost near Yellowknife. The end product, cloudy white diamonds, emerges through a complicated system of mining and refining techniques. First, cone-shaped kimberlite pipes (large, characteristically shaped, rough-bearing diamonds) are extracted through open pit mining or, increasingly, through underground mining techniques. Once rock has been blasted and shovelled out, heavy equipment operators remove waste rock to a dumpsite and haul kimberlite-bearing ore to a processing plant.

Next, kimberlite "scrubbers" separate kimberlite from surrounding granite, and a series of increasingly refined processes gradually remove all remaining kimberlite from rough diamonds. These secondary refining processes involve the use of centrifuges, "grease tables" and X-ray luminescence.

Conveyor belts transport materials at increasing levels of refinement from hopper to hopper as diamonds are carefully extracted from kimberlite.

The combination of mechanical, chemical and physical technologies requires operators to use equipment optimally and to keep equipment in good working order to maximize the diamond yield from mined kimberlite pipes.

Essential skills training is key to ensuring safety and productivity as diamonds are extracted from the tundra.

The WLP at BHP Billiton has expanded in the three-and-a-half years it has been operating. The company is moving from developing curriculum directly aligned with workers' jobs to optional modules broadly related to workers' interests and needs, such as money management and small business management.

Adult educators at BHP Billiton strive to marry essential skills with workplace content. Accordingly, modules are labelled and positioned for workers based on typical situations that require the use of essential skills in and around the workplace. Thus, rather than offering a general course on "document use," instructors at Ekati have developed a "Standard Operating Procedures (SOP)" module related to finding, reading, understanding and interpreting SOPs at the mine site. Another example is the way in which money management training has been pitched to employees. Rather than offering a "money management" course, the Ekati instructors have positioned their essential skills training in this area as "Understanding Pay Stubs," which involves the development of the essential skills associated with using numbers and documents.

At the mine, the WLP offers one-on-one tutoring, in addition to small classes. And workers can always take advantage of pre-trades math and science classes, General Educational Development (GED) high school equivalency preparation classes and computer reading

classes. Workers attend classes and other learning activities within the WLP for two hours every two to three days. They attend the program on a combination of work-release time and personal time.

While the breakdown of workers participating in these different streams varies within BHP Billiton's WLP, typical enrollment patterns show that one-third of participating workers are involved in core literacy, another third are involved in independent learning and GED preparation, and the remaining third are involved in pre-apprenticeship training.

RESOURCES

After profiling the essential skills of its four entry-level positions, BHP Billiton hired two adult educators in 2001 to design and develop the WLP. Later on, as demand for the program grew, it hired a third pre-trades apprenticeship adult educator. Adult educators at Ekati work split shifts and teach two classes per day. Approximately 60 per cent of their time is spent teaching content and providing one-on-one feedback to learners. Instructors spend the remaining 40 per cent of their time developing curriculum, scheduling classes and working with other mine site team leaders, supervisors and staff.

The Ekati mine site provides two classrooms for essential skills training. One classroom is dedicated to workplace training done on company time, while the other, located in the mine's recreational facility, is used for voluntary learning activities, including GED preparation. In addition to providing classroom space, the company provides customized literacy and trades materials and resources drawn from the Ekati mine site itself.

Essential skills training involves time commitments from both BHP Billiton and from its workers. Employees participating in core WLP programs receive paid work release time. On average, this requires an investment on the part of BHP Billiton of four to six hours per worker during a typical two-week work rotation (in other words, 104 to 156 hours of paid release time per worker per year).

BHP Billiton's investment in core essential skills training is significant, given that approximately 140 of the 900 shift workers at the Ekati mine site participate in core training. In a given year, BHP Billiton invests

between 14,560 and 21,840 hours of paid release time in core essential skills training. Core WLP programs are voluntary—the company believes that a direct link exists between success in essential skills training in its core programs and safety, better productivity and good morale.

Employees participating in independent study programs, including distance learning, do so on their own time. Employees participating in GED preparation typically commit two hours weekly for eight months of their own time, but are paid by the company for the nine hours required to write the GED exams. BHP Billiton estimates that 30 to 40 workers participate in such optional essential skills development programs at any given time.

Employees participating in trades training receive three to four hours per week in paid work release time to accomplish their learning objectives. Depending on where they are in their pre-apprenticeship or trades training program, workers may commit an equal amount of their own time to training in these areas.

BHP Billiton does not receive any external funding for its core and optional essential skills development programming. The company does, however, receive a small portion of external funding for its pre-apprenticeship and trades training programs.

BHP Billiton's resource commitment goes beyond providing release time for its employees to participate in its WLP. The company makes a significant investment in consulting with all staff to determine their needs and in crafting customized programming to meet the skills development needs of its entire workforce. Indeed, the program is successful not only because BHP Billiton commits so many resources to it, but also because it invests in ongoing curriculum development: supervisors are consulted often for curriculum ideas and feedback on the company's skills upgrading efforts.

INNOVATIONS

This program is unique in that it brings together workplace learning, Aboriginal content and functional literacy (which includes personal and community interests) and offers customized program content for each individual learner. While the corporate need for a skilled workforce is an essential consideration, the learning

program focuses on the individual—both at the assessment stage and in the delivery of the program. To promote the continuity of individual learning programs, the adult educators maintain close working relationships with community adult educators across the NWT to support workers' learning on their time off from the mine. The adult educators at the mine also participate in collaborative training events with community adult educators and college staff in order to be more effective in the training they provide.

The program is designed in collaboration with supervisors and with input from workers. The adult educators have made a point of understanding workers' positions as much as possible, through job shadowing, learning how diamonds are mined, and by understanding everyone's role in the process. The resident adult educators work flexible shifts to accommodate day and night shift workers. Workers may join ongoing literacy classes and pre-trades upgrading offered at the mine, and they receive paid work-release time to do so. To help create and maintain an overall workforce with the best skills possible, the WLP is open to BHP Billiton employees and contractors alike.

Part of the "magic" of essential skills training at the Ekati diamond mine site is the remoteness of the location and the fact that employees live on-site for two to three weeks at a time and have few options for occupying themselves during their personal time. As such, employees are a kind of "captive audience" who have the opportunity to upgrade their essential skills when they finish a shift. The Ekati site makes satellite television available to all employees and does provide recreational facilities, including saunas and golf simulators. Still, many employees voluntarily participate in essential skills development activities on their own time after their shifts are finished.

Another innovation in essential skills training at Ekati is the emphasis placed on developing verbal communication skills and enhancing employees' ability to work with others. Because workers live and work in close proximity for up to three weeks at a time—dining, working and sleeping in shared accommodation—managing personal differences becomes an essential skill. Conflicts from the workplace, the mess hall or living accommodations can easily spill over from one setting to another, negatively affecting safety, productivity and morale.

The Ekati workforce is also ethnically and religiously diverse and incorporates workers of different ages and genders who may be removed from their normal "support systems" when they are on-site at the mine. BHP Billiton has a "zero tolerance" policy with regard to violence and fighting in the workplace, and contract workers teach courses at the site in non-violence crisis intervention.

BHP Billiton takes a variety of approaches to improving communication and teamwork skills in its workforce. At the start of each day, it holds crew talks as an opportunity for giving and receiving feedback, uses case studies and employs role-playing techniques. A typical essential skill that the company develops is how to respond to feedback without becoming defensive. It also offers a course in radio etiquette, which focuses on teaching radio operators to use the communications tool respectfully and not as a vehicle for dressing down a co-worker over the public airwaves.

Perhaps the most exciting innovation in essential skills training at the Ekati site is the recent trend towards engaging employees and supervisors alike to participate and act as facilitators in optional programming, specifically designed to meet the needs and interests of the workforce. One of the upshots of this facilitation is the company's plan to offer a course in spoken Dogrib.

CHALLENGES

Creating a learning culture within a workplace at a remote northern location is challenging. Besides the lack of physical access to formal educational institutions due to geographic distance, several concerns are apparent in developing and maintaining the learning program.

PROGRAM DEVELOPMENT CHALLENGES

- getting buy-in from all levels of management and from workers who may be coping with the stigma of low literacy
- learning how literacy and essential skills are best developed at the mine site
- helping the mining world see and understand the essential skills embedded in lessons developed by adult educators
- helping the mining world see the link between the essential skills that are taught and how those skills are transferable and useful on the job (for example, enhancing a worker's communication skills may help

to make that worker more comfortable speaking up at a safety meeting, which, in turn, may improve morale, productivity and safety at the mine)

- trusting adult educators to understand the business need for essential skills training and convert that into something teachable with observable workplace benefits
- scheduling time for learning when production and work at the mine site is continuous, 24 hours per day, seven days per week, 365 days per year
- understanding that, in terms of priorities, workplace learning must come second to safety and production targets (workers are not released from their work for training if their absence will jeopardize meeting minimum crew numbers for safety or production reasons)

PROGRAM MAINTENANCE CHALLENGES

- dealing with an interrupted work and learning schedule (that is, workers are present at the mine site for two weeks, then are off-site for two weeks)
- working in isolation—program educators at the remote site cannot gain easy access to other educators for consultation, feedback and discussion
- maintaining confidentiality of learners' progress when workers, supervisors and adult educators are always in close quarters at the remote site: living, travelling, eating and working together
- progressing fast enough—workers at low literacy levels often want to see quick results from their efforts
- helping individuals to gradually take responsibility for their own learning paths and choices

The most striking challenge faced by the adult educators at BHP Billiton also represents Ekati's greatest opportunity. As markets and companies become more competitive, they tend to allocate resources to new technologies and more highly skilled workers. The Ekati mine has resources on-site, and that is why workers and production facilities are there. Yet, as the educators at Ekati observe, essential skills are the "invisible thread" to more effective training, increased production, morale, retention and innovation. The adult educators, as essential skills trainers at Ekati, have observed that workers who feel valued and empowered to speak up or write out their suggestions tend to present helpful problem-solving ideas. By the same token, employees with low morale tend to feel that the company is not interested in hearing their experience in the field and withdraw accordingly.

LESSONS LEARNED

Educators at Ekati have learned many lessons about adult learners themselves and about the craft of teaching adults in four-and-a-half years of offering their WLP. In particular, educators have learned not to assume that a worker has a strong set of essential skills based on how they present themselves or on how articulate they might seem.

Moreover, the adult educators at Ekati are continuously learning how to develop learning materials for the workplace that are based on essential skills at a time when procedures and practices in the mining industry are continuously changing. The Ekati site has gone from open-pit mining to underground mining, which has required the introduction of new procedures for safety and heavy equipment.

Employees themselves are learning about different ways of learning (multiple intelligences). Learners are realizing the depth and extent of knowledge and experience they bring to the job (such as the ability to figure things out on their own when they are out on the land) and are becoming more interested in building not only their job skills but also the essential skills they need to be more successful in their personal lives. Employees recognize that the mine is not going to be operating forever and they will need to prepare for the day when they need to make a fresh start in the labour market. Increasingly, workers at the Ekati site are investing more in their work roles and are taking greater ownership of their skills development.

SOLUTIONS/KEYS TO SUCCESS

Despite the considerable challenges of creating and maintaining a learning program at a remote northern mine site, the WLP at BHP Billiton Diamonds Inc. continues to be a great success. One very important key to success: upper management's buy-in and support of the WLP with paid work release time. The real breakthrough on this front came when the WLP was listed on the daily lineup sheet, and "who gets to go to school" was posted alongside work assignments for the day.

Another key was inviting managers, team leaders and supervisors to see first-hand what adult educators/essential skills trainers are doing. This helped to remove the "mystique" surrounding the training. Moreover,

inviting input and suggestions from workers and managers alike helps to keep the WLP current and relevant. The concept and definition of learning has expanded since the WLP was launched in 2001. Learning is no longer confined to the “three Rs”; workplace-relevant learning that appeals to workers and their managers now includes such things as the ability to figure out bonuses based on production and safety records, researching the causes of fatigue, and distinguishing, in Stoic-like fashion, between things over which one has control and those that are beyond one’s power to change (especially with regard to interpersonal dealings, company policies, etc.).

In addition to management support and worker enthusiasm, several elements are key to the program’s sustainability:

- Consistency, confidentiality and respect for workers, managers and supervisors is maintained.
- Confidence is instilled in workers, motivating them to gradually take risks.
- Educators are approachable and available to everyone.
- Educators consult and collaborate with adult educators at other remote mine sites and with local community adult educators to share resources and ideas, provide support and learning continuity, and to bridge isolation.

OUTCOMES

Due to the enthusiastic support and hard work of all levels of employees, the learning efforts at the BHP Billiton Diamonds Inc. mine site yielded positive results. The outcomes range from some workers, formerly non-readers and non-writers, learning to read and write, to other workers passing pre-trades examinations. Workers at every level of skills upgrading are making strides towards improving their own performance and productivity, thus benefiting the organization as well as themselves. Other specific outcomes of the learning program include:

- workers improving literacy and numeracy skills;
- workers preparing to complete their high school equivalency examinations;
- the first group of 18 participants passed their GED high school exams in June 2004 and received diplomas;
- Aboriginal workers moving from entry-level jobs into apprenticeships and receiving support from the company to ensure that they will succeed throughout their apprenticeship;

- workers improving their confidence and participating more often in safety meetings and discussions about equipment or processing;
- workers using their skills at home, with children, in money management issues, problem solving and decision making, with band council meetings, etc.; and
- workers setting long-term goals as a result of increased morale.

IMPACTS AND BENEFITS

The long-term impacts of this relatively new program have yet to be fully realized. One unintended, but highly positive, consequence of the WLP is the program’s tendency to provide a voice for workers and a resource for them to have some of their concerns and questions answered. While WLP adult educators are not counselors, they refer workers to their Employee Family Assistance Program (EFAP) when appropriate. WLP adult educators/essential skills trainers therefore occupy a safe, in-between place where workers can ask a question and receive information without jeopardizing team relations. In turn, they receive the right information in a learning context, which helps to reinforce the relevance and usefulness of essential skills training to workers in their working and personal lives.

Ekati’s WLP is visibly producing a number of other benefits linked to upgraded skills, including:

- a safer and more productive workplace;
- lower turnover—when workers feel their needs are being met through their job, the WLP and their support systems (co-workers) at the mine site, they tend to stay in their jobs;
- increased participation in all workplace activities;
- workers taking on new roles as mentors and peer learning coaches;
- improved self-esteem of workers;
- increased motivation to learn, enhance skills and develop a career progression plan;
- workers pursuing educational goals that they would otherwise not be able to pursue because of their two-week-on/two-week-off work schedule;
- workers who may have had limited educational opportunities overcoming their fears of reading and writing;
- increased awareness of the importance and transferability of education, both on the job and at home;

- support towards achieving new goals in workers' lives; and
- continued hiring of northern Aboriginals from remote communities.

For many workers, having a pre-trades adult educator on-site at the mine means the difference between pursuing a trade or giving it up. Many workers come from small communities that do not have a pre-trades college program or an apprenticeship program representative. With proper tutorials and general support from the pre-trades adult educator at the mine site, however, more workers are now able to succeed in the formal schooling component of their trades training programs.

USE AS A MODEL

The WLP at BHP Billiton Diamonds Inc. is well-suited for northern or remote workplace sites, with its flexible training schedule and customized curriculum. It especially targets Aboriginal workers who may have had limited experience with written language or formal education. BHP Billiton is in contact with other companies operating workplace education programs, including coal- and diamond-mining firms in British Columbia and Saskatchewan, who regularly ask BHP Billiton for advice, resources and support.

About the Education and Learning Case Studies

The Education and Learning case studies examine outstanding education and learning programs and initiatives. The case studies provide in-depth analysis of the methods used to develop, assess, implement and deliver education and lifelong learning in schools, colleges, universities, workplaces and communities. They focus on goals, activities, resource requirements, achievements and outcomes, benefits, innovations, and keys to success and challenges.

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