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What Is Technical Training?

TECHNOLOGY IS CHANGING EXPONENTIALLY, and we now see human capital is a company's biggest asset. But it is puzzling that those two facts refer to a topic that gets little attention in literature and at training industry events and is often forgotten in HR organizations globally: training and development of the technical workforce, also referred to as technical training! What is it? How is it different from other types of training? Is customer training or technology-based training considered technical training? How does technical training relate to product development or human resource development? Do only technical experts need it? There are no commonly accepted answers to these questions. This chapter defines what technical training is and what it is not. An inclusive definition includes training on content related to any technology and training on content specific to a discipline, function, or profession. It sets technical training apart from other

types of training, also considered non-technical training. Related activities that are often called technical training but aren't necessarily technical training are examined, and the differences between those activities and technical training are clarified.

The Complete Training Suite for Technical Experts

What is technical to one person is not technical to another. Many factors play into this and include, but are not limited to, different background, experience, and values. This is not only true for the general population but also for training experts, who are faced with decisions like the following when designing curricula and developing or deploying training:

- Should a course on “technical leadership” be part of a company’s leadership curriculum or technical skills curriculum?
- Is training on the Sarbanes–Oxley Act, which informs employees about standards for public companies in the United States, ethics training or technical training?
- Is training on a project management tool considered general skills training or technical training?
- Should Cisco security training be considered technical training or IT training?
- Should maintenance management training be on a management or technical curriculum?
- Is training for Microsoft Word technical training or professional skills training?

Technical Training Defined

The Society for Human Resource Management (SHRM), the world’s largest association devoted to human resource management, defines training (and development) as “the process to obtain or transfer knowledge, skills, and abilities needed to carry out a specific activity or task” (SHRM, 2009). If SHRM’s definition of training is accepted as a baseline, then the question is: How is technical training different from this general definition of training? Would

medical training for registered nurses be considered technical training? Would training on legal statutes be considered technical training? For some it would, but for others it would not, similar to the examples mentioned earlier. Fifty interviews with Fortune 1000 business executives and managers, technical experts, training professionals, and other thought leaders in the field of HR and training yielded some interesting definitions of technical training, covering many different aspects, as the following definitions illustrate.

DEFINITIONS OF TECHNICAL TRAINING

- “Technical training is product support and development training, for example, training for the maintenance of vehicles. It is different than core/front office and non-core/back office training, for example, Microsoft training, time management training, program management training, and soft-skills training.”
- “Technical training is everything that has to do with computers.”
- “Since this is a product/software company and technical training is responsible for all product training, technical training is everything that is not management and leadership training.”
- “Technical training is about people learning a technology, tool, process, or workflow; it is about understanding software and hardware.”
- “Technical training is anything that builds the skills of the research and development community. For the IT community, it would be programming or debugging.”
- “Technical training is every bit of training required to gain competence as an individual contributor, for example, as a scientist or engineer. It does not include soft skills or finance training.”
- “Technical training is any training on the design, implementation, support, or operation of a technology.”
- “Technical training is training for all products, and it is training that is not management and leadership training.”

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- “Technical training is related to a function and how I do my job on a daily basis. The word ‘technical’ is based on function, not technology.”
- “Technical training is everything that has to do with computers, it does not include finance training; that is called professional skills training. The context is important: for a training company, legal training for lawyers is technical training, and for a hospital training for nurses is technical training. In a technology company, it is not.”
- “Technical training is technician training.”
- “Technical training is related to a technology based subject, as opposed to sales training that is related to a process or HR training that is related to touchy feely stuff.”
- “Technical training is broken into the following segments: desktop training, software development, engineering and design training, infrastructure/telecommunications training, and equipment/hardware training.”
- “Technical training is always associated with hardware or software, no matter what device it applies to. You need one of these components to call it technical training.”
- “Technical training is training related to a real technical topic like Six Sigma or math; it is the opposite of soft-skills training. The depth of the subject or knowledge of Six Sigma is what makes it technical. Six Sigma also has a quality aspect, but the complexity and the math/statistics that is part of it makes it technical.”
- “Technical training is training that teaches applicable skills with some type of technology. Technical training needs to be specific to a technical area. It is anything hardware or software related or technical in terms of manufacturing. Technical training is anything that is not soft skills or common skills training.”
- “Since I come from technology companies, technical training is training on technology. However, training in a marketing function is different because then technical training is training related to that particular function. So, if you look at technical training holistically, technical training is not just training on technology.”

All of these definitions have merit in their own right and are correct to the people who gave them. They reflect a combination of background, experience, and values and, while they vary widely, the patterns are clear:

1. Most employees who do not have a technology background consider technical training to be training specific to a discipline, function, or profession or IT training.
2. Employees who work in, or have experience in, a technology company and/ or have technology related training and education, largely define technical training as training related to technology.
3. The majority of employees from the high-tech world have a narrower definition of technical training than employees from other technology companies. To them, technical training tends to be IT training only.
4. Technical training as a category is set apart from training for managers and executives, often called management and leadership training, and training that is built on social sciences, often referred to as soft-skills training.

Michael Littlejohn, vice president of the Stimulus Response Team for IBM Global Business Services, confirms these findings: “Because I work for IBM, I default to IT training when asked for a definition of technical training. If I put my management consultant hat on, it takes on a different meaning. Technical training then becomes training where the content is more objective, concrete, and explicit. Some people differentiate between soft and hard skills, but it is not that black and white. Technical training is training for a concrete discipline. Medical training is technical training. Training a phone technician on how to test fiber optic lines is technical training—it depends on the hat you wear.”

If “technical” is defined as “related to a specific scientific, mechanical, or specialized discipline, function, or profession” and added to SHRM’s definition of training, a very inclusive definition of technical training is the result: The process to obtain or transfer knowledge, skills, and abilities needed to carry out a specific activity or task, related to a specific

scientific, mechanical, or specialized discipline, function, or profession. It is similar to a definition of technical training Rothwell and Benkowski offer: “instruction intended to help people perform the unique aspects of a special kind of work and apply the special tools, equipment, and processes of that work, usually in an organizational setting” (2002, p. 7). As a baseline, they use job categories that are considered to be technical in nature, as defined by the Bureau of Labor Statistics (2009). While very general and all encompassing, it provides a starting point for technical training–related discussions.

In 1995, ASTD defined technical training as “the most common type of skill improvement instruction that seeks to increase the technological capabilities of workers” (Kelly, 1995, p. 586). This definition is very straightforward and only includes training focused on technology. For the purpose of this book, technical training will be split into two types of technical training. The first will be technical training where the focus is on technology and will be defined as “training on content related to any technology.”

TECHNICAL TRAINING

Training on content related to any technology

Technical Functional Training

As the comments from the interviews and Rothwell and Benkowski’s definition have shown, another set of development activities is often considered technical training. Instead of relating to technology, it is training related to a specific discipline, function, or profession. It is training that is necessary to understand and manage one’s job and is sometimes called professional skills or functional training. In most companies, the functions are engineering, sales, manufacturing, HR, legal, finance, and IT. Training for these functions would be technical functional training, which in the case of engineering and manufacturing, is specifically technical training.

TECHNICAL FUNCTIONAL TRAINING

Training on content specific to a discipline, function, or profession

While in some cases there is a big difference between technical training and technical functional training and the book differentiates between the two where appropriate, the similarities are also significant. Hence, the focus of this book will be on both types of technical training unless otherwise indicated. For reasons of simplicity, “technical training” will relate to both definitions. The goal is to differentiate technical training and technical functional training from other types of training and highlight the intricacies of each. Characteristics that technical training shares with other types of training are not a focal point of the book.

While technical training is often defined as training for hardware and software, this type of training is only one aspect of technical training and is called information technology (IT) training. IT training is training on content involving the development, maintenance, and use of computer systems, software, and networks for the processing and distribution of data or, simply stated, computers.

IT TRAINING

Training on content involving the development, maintenance, and use of computer systems, software, and networks

IT training can mean two different things depending on the context. For IT professionals, IT training is technical functional training because it is the core of their profession; for all other disciplines, functions, or professions, it is technical training. With the use of computers in almost all disciplines and professions, companies are seeing a commoditization of some IT training, in particular desktop training. Twenty years ago, desktop training was without exception considered IT training; however, today it is often found on a general skills curriculum.

CHARACTERIZING TECHNICAL TRAINING AT AN INTERNATIONAL PHARMACEUTICAL COMPANY

An interview with the HR director based in Hong Kong.

How Does Your Company Define Technical Training?

Technical training relates to specific technology based training programs and activities for associates in different job families. It is targeted at all employees. Examples of courses include systems, tools, and applications training, like IT and information systems related training, new office system training, sales record tracking system training, and finance budgeting tool training.

How Does Your Company Define Technical Functional Training?

Functional training means training for associates in functional departments such as sales, HR, legal, clinical development, medical affairs, and so on. It provides employees in these functions with the required functional knowledge, concepts, and skills they need to perform their jobs. An example is product training for sales people.

How Is Technical Training Different From or the Same As (Technical) Functional Training?

In our company, non-mandatory training or non-managerial/leadership training is usually referred to as functional training or technical training. Sometimes there is overlap. For example, training on a financial budgeting tool is part of the functional curriculum for finance associates and is also part of the technical curriculum for all the budget owners in the company including commercial leaders, HR associates, and so on. Since almost all functions at our company use some type of technology, most functions require technical training. Some courses are applicable to several functions, but most courses on the functional curricula are specific to a particular function.

Do Technical or Functional Training Courses Ever Include Non-Technical Content? If So, Can You Give an Example?

The boundaries between technical/functional training and non-technical training are somewhat blurred. Even in some technical training courses, non-technical skills or knowledge are incorporated to improve overall knowledge and effectiveness. One common example is product training, which is considered functional training. In product training, not only product knowledge and disease knowledge (the technical aspect in functional training) are taught: questioning and inquiry skills, which are considered soft skills, are also addressed. Technical content can be dry, and some may consider it to be tedious to learn. To ensure engagement and learning, non-technical content is usually included in the application component of the technical and functional training to help employees learn and apply concepts to their daily work.

What Training, Aside from Technical and Functional Training, Is Available?

New hire training, compliance training, soft-skills training, company culture related training, management skills training, and leadership training are also provided to employees.

What Organizations Offer Technical Training, Functional Training, Soft-Skills or Management Training?

Training is delivered by external training companies and internal trainers, who teach locally, regionally, and globally. Our internal trainers, who teach technical and functional training, are the content experts in their respective functions. Management training is usually delivered by HR training professionals. External vendors play an important role for us but usually have limitations.

Are There Different Terms That HR, Employees, or Managers Use for All These Different Types of Training?

People use different names and terms for courses on the technical training curricula and the functional training curricula. For other training, such as soft-skills

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training, the terminology is quite clear and all parties seem to be able to use the same language.

Have You Observed Any Differences in the Area of Technical and Functional Training Between a Pharmaceutical Company and Other Companies You Have Worked at?

My experience is predominantly in high tech and the pharmaceutical industries and, generally speaking, I do not see any difference in how technical and functional training are defined or managed across the two industries.

Are There Any Differences Between Technical and Functional Training in the U.S. Versus Asia That You Have Noticed?

Functional and technical training courses in the U.S. seem to have a wider scope than those in Asia. It is also more common to find soft-skills aspects incorporated into technical or functional training in the U.S. Training in the U.S. tends to focus more on the application of the knowledge gained. An example is a sales product training course that is delivered both in Asia and the U.S. In the U.S., employees are expected to acquire knowledge prior to training, and instructors subsequently focus on practicing the skills through role play and applying them in the daily work context. In Asia, the same course contains more product information and less practical or real-life application.

How Would You Summarize the Value Technical and Functional Training Adds to Your Company?

There are three main benefits we see. Technical and functional training (1) enhances the skills and knowledge of the employees to perform their jobs, (2) increases employees' judgment, and (3) saves managers' time because less coaching is required. When employees from different functions participate in training together, they gain an increased understanding of operations and communication is enhanced.

Personal Effectiveness Training

Technical employees face a big challenge on a daily basis. Not only do they have to constantly learn new skills and live with the pressure of skill obsolescence, but they also have to focus on building additional, non-technical skills—a need that is becoming more and more apparent. In addition to understanding their jobs and respective technical skills, technical experts need to understand themselves. Many different categories have been defined for this type of training. The most common terms are soft-skills training and management and leadership training. Other common categories are basic, general, people, interpersonal, communication, HR, generic, employee development, management development, and executive skills training.

As the categories already suggest, examples of courses that help employees understand themselves include decision making, giving and receiving feedback, influencing, collaboration, problem solving, team building, and negotiation. The list is not exhaustive and never can be, as there are countless titles, combinations, and variations. For the purposes of this book, this category of skills and related training is termed “personal effectiveness” skills and training. It incorporates soft-skills training and management/leadership training, as both of these types of training aim to teach skills to understand and manage oneself.

PERSONAL EFFECTIVENESS TRAINING

Training on content that teaches skills to understand and manage oneself

It is important to note that personal effectiveness training has a cumulative, rather than an additive, effect on technical experts, enabling them to become well-rounded employees, managers, and people in general. As Tom Kelly, training and learning industry consultant, puts it, “Technical training is transitory to accomplish a job. Soft skills are more enduring: they have impact beyond just the job, we can integrate them into our personal lives.” For example, if a recent college graduate took all the personal effectiveness

training available in the first year of employment, it would not have the same effect as taking those same courses over the span of a career. The reason that personal effectiveness training is cumulative is that people hear the messages in the training differently, depending on where they are in their lives and careers. Life experience and maturity increase the value of a personal effectiveness course.

It is not the intent of this book to define different curriculums for personal effectiveness training, as the resources for that are as unlimited as the courses themselves. What is important to highlight, however, are some additional points as they relate to personal effectiveness training for technical professionals. Differentiation of training by skill is more helpful for technical experts than differentiation by audience, which often is done for professional skills training. Curricula that are defined by audience (like curricula for new hires or managers) generally have a limited shelf life and are for the benefit of training administration primarily. Curriculum definitions based on skills that technical experts need, such as a technical curriculum or a personal effectiveness curriculum, are more useful for the technical experts if they are broken up by topic and show skill progression. Those curricula also tend to survive employee and organizational transitions.

Many people are quick to judge technical experts on their lack of personal effectiveness skills, and generalizations that people with strong technical talent do not have exceptional people skills are not uncommon. It is a reality for many technical experts (and this does not necessarily include technical functional experts) that their forte is technology and not interaction, communication, and so on. One must comprehend, though, the tall order true technical experts have been handed in terms of skills development. Technology changes make technical skills obsolete at a faster rate than other skills. Technical experts need to keep up with that. This is slightly different for technical functional experts: marketing principles for marketers, accounting standards for finance experts, or labor laws for HR professionals do not change as frequently and are not as intertwined with other standards and related disciplines. So not only are those functions more confined to their own areas, but their skills are longer lasting. There is only so much time in a day and only so much time allocated for training. Technical

experts realistically cannot be experts in their respective fields and in behavioral sciences and business concepts. Interestingly enough, the challenge is still fairly one-sided, although that is slowly changing. Marketers, finance experts, and HR professionals are not as often chastised for their lack of technical knowledge as technical experts are for their lack of business or personal effectiveness skills; they do get some criticism for their lack of business acumen but still not as much as technical experts do for their lack of personal effectiveness skills.

A common complaint is that technical professionals traditionally receive little training in the domain of non-technical skills. Lack of training may be one reason why many technical contributors find it difficult to move from a technical expert in their field to an effective people manager. Managers of technical experts need to be accountable for ensuring technical experts receive personal effectiveness training. Because managers of technical experts often have a similar background, and hence similar resistance and prejudice, a cycle is created that needs to be broken by allocating budget and time for such training.

Because technical experts gravitate more toward technical and technical functional training than toward personal effectiveness training, in some companies offering mental bridges can help. Not calling personal effectiveness training “soft skills” is a first step. This categorization tends to alienate technical experts and downplays the perceived need for such training. Calling a leadership course “technical leadership” or a communication course “communication for technical experts” can go a long way. Embedding personal effectiveness modules in technical courses is another option if attendance at personal effectiveness courses is an issue (Stone, 2006). “However, it is often difficult to squeeze soft-skills education into a course already jam-packed with technical skill requirements” (McLean, 2006). Highlighting the technical aspects of a personal effectiveness course may help. For example, emphasizing the use of a calendar program in a time management course or the use of intranets in corporate communications focuses on the technical aspects within the personal effectiveness course. Additionally, Edmonds Wickman (2008) believes because technical people tend to be more analytical “it’s important to teach them soft skills in the same way you would teach technical skills.”

CASE STUDY: MOTIVATING ENGINEERS TO TAKE NON-TECHNICAL COURSES WITH ASME

Dr. Amy Geffen, director of Volunteer Leadership Development at the American Society for Mechanical Engineers (ASME), explains how ASME influences their technical members to take non-technical or managerial courses. ASME is a non-profit professional association dedicated to creating excitement about engineering. Its mission is to serve diverse global communities by advancing, disseminating and applying engineering knowledge to improve quality of life. ASME provides education, publications, and advocacy. ASME's 127,000 members are students and entry-level, mid-career, and seasoned engineers and biologists. Although the association was founded in the United States, members are from 140 countries.

ASME uses a number of different methods to gather information about members' training needs, including:

- Biannual surveys
- Periodic focus groups at conferences
- Training evaluations
- Customized company assessments of engineers and engineering managers

In response to the needs identified through these various methods, ASME provides a wide variety of live and online courses and webinars to keep members and interested non-members abreast of developments in engineering and management. Training activities occur during the year at conferences, workshops, seminars, and webinars. ASME also works with engineering firms and consults on their skills development needs.

One longstanding issue has been the need for engineers to develop management and leadership skills to enhance job performance and serve as effective volunteer leaders within the Society. ASME constantly strives to close this gap by weaving non-technical offerings into the technical curricula and programs:

1. Global Management Conference—ASME hosts a major conference dedicated and focused solely on management issues and challenges.
2. Leadership Training Conference—This annual conference, which attracts roughly three hundred members who are active in different sections and committees of the society, includes interactive sessions on topics such as business and strategic planning and budgeting.

3. **Specialized Conferences**—Conferences in the nuclear, power, and pressure vessels engineering areas include non-technical training tracks.
4. **Leadership Orientations**—Orientations, which are led by senior staff and volunteers, focus on enterprise-wide issues such as strategic initiatives, financial responsibilities, or board legal responsibilities.
5. **Professional Practice Curriculum**—A curriculum with forty short online interactive modules on engineering principles, business practices, and professionalism for college students and early career engineers.
6. **Special Workshops**—Special workshops on management topics through outside consultant groups such as The Tom Peters Group are meant for emerging and senior leaders and are by invitation only.
7. **Live Courses**—More than one hundred courses, including seventeen management-related courses are offered live at eight major U.S. cities and three cities in Europe.
8. **Online Courses**—Instructor-led and self-study online courses, twenty of which are dedicated to non-technical topics, such as problem solving and project management.

Engineers want to know “What’s in it for me?” when taking the time to develop managerial and leadership skills. ASME shows members how non-technical skills enable them to move up the career leadership ladder within the Society and on the job. The Society’s promotional material and website explain the benefits of all of their offerings and conferences.

The Society also uses leadership opportunities within the organization to provide engineers an opportunity to practice their leadership skills. It has defined leadership competencies and knowledge areas required at each level of the volunteer structure—from sector (chapter) level, committee, division committee, board, vice president, senior vice president, and board of governors (director) levels. Examples of leadership skills include managing a sector meeting, writing a business plan, developing a strategic plan, and managing change. Volunteer opportunities include:

- **Volunteer Orientation and Leadership Training (VOLT) Academy**—The Society has a special department that serves as a resource center and provider of training, guidance, and materials for all ASME volunteer leaders.

- VOLT Resource Website—The website is a central repository of information and resources for volunteers. In the future it will be part of the learning management system that the Society uses to house online courses.
- ECLIPSE for Emerging Leaders—This program targets early-career engineers who are interested in moving up the volunteer career ladder. Engineers apply for the position and are assigned to a specific sector. They attend and participate in committee, council and board meetings based on their individual development plans.

Despite the challenge of getting engineers interested in non-technical training, the Society is able to leverage its unique position to overcome this obstacle. As a professional engineering society, the caliber of its members and instructors has contributed to its excellent reputation as a premier provider of training for engineers.

Business Training

To understand and work effectively within a company, a number of business skills are required. Examples include accounting and finance principles and general business operations, including strategic thinking, business acumen, ethics, and safety. Business training helps technical experts understand how the company works holistically. It gives them understanding, context, and language to use when presenting their work and showing the impact to the company

BUSINESS TRAINING

Training on concepts that teach skills to understand and work effectively within a company

While many technical experts would like to work uninterrupted in laboratories where they can talk technical with other experts and avoid meetings, this is no longer possible in today's fast-paced world. Business training is a way to connect them to other parts of the company and challenge them to

apply systems thinking to their work and take into account other functions and impacts in an integrated and systematic manner. A study by Lake Forrest Corporate Education concludes that most technical experts can no longer remain specialists but need to broaden their mind sets and skill sets to include business skills if they want their companies to remain competitive (Leck, Spilotro, & Wang, 2006, p. 3). The goal is to ensure an understanding of the business but also better communication between business people and technical experts.

The more senior technical employees become, the more apparent the need for training on business skills since technical experts often move into management positions. Business skills are also important to customers. More and more customers place a high value on the ability to translate technical concepts into common-sense business language and put the “business first.” Speaking the business and customer’s language demonstrates that technical experts understand their issues and increases others’ confidence that they will be able to develop relevant solutions. Opinions vary widely in terms of what business training technical experts should take—in general, it depends on prior experience, feedback from others, company culture, and availability of offerings. As with personal effectiveness training, the intent is not to define business curriculums but to highlight the need.

Unfortunately, the need and value of business training, similar to personal effectiveness training, is often underestimated, creating a gap between technical experts and those on the business side. “In today’s corporate world, it often seems like technical and business people speak completely different languages. So the end result is technical people who can’t get their points across and business people who regard technical personnel as skilled technicians with little, or no, management potential” (Ortiz, 2006). The underlying reason for this dilemma is that people choose professions based on their natural aptitude and interest.

“The qualities and skills that make great technologists, engineers, and scientists are not the qualities and skills that make great business-people. For example, think of a technical specialist and what picture appears? Often the mind conjures up the stereotypical image of the ‘gear head’ sitting in his or her respective cube tinkering with

the latest gadget, the 'heads-down programmer' hovering over the computer writing code, or the 'man in the white coat' watching the contents in the glass beaker boil atop the Bunsen burner. These are, of course, stereotypes, but these images were born from somewhere. Traditionally, technical specialists pursue careers in their respective fields because that is where their interests and proficiencies lie. They're good at their jobs, and certainly, businesses cannot survive without experts such as these. Still, people who focus on data, who can follow an idea from start to finish in perfect order, who concentrate on a single project, are not generally the people who are seen confidently taking questions at a business meeting." (Leck, Spilotro, & Wang, 2006, p. 4)

The fact that technical experts often lack business (and personal effectiveness) skills cannot be blamed only on natural talents. Colleges and universities are under pressure to graduate well-rounded and prepared students who not only know their own disciplines but can also adjust and work effectively in a company environment because they have the personal effectiveness and business skills to do so. As Dr. Barry Farbrother, dean of the Tagliatela College of Engineering at the University of New Haven, points out, it was difficult to develop a broad skill set before the mid-1990s because engineering accreditation was somewhat prescriptive. Back then, disciplinary engineering programs had a great deal of similarity, rendering the course catalogs almost identical across institutions because educational content was set by the Accreditation Board for Engineering and Technology (ABET). When ABET revised its accreditation process, the guidelines for the engineering programs were relaxed, requiring universities to consult their stakeholders (including the companies that were hiring graduates from their schools), to determine what type of skills (technical, technical functional, personal effectiveness, and business skills) were needed, and they built the curriculum accordingly. Today colleges and universities approach this differently and students engage in college-level courses on everything from technical skills to people skills" (Gilmore, 2008).

Because technical experts do not tend to gravitate toward non-technical training, some technical training vendors have found a good way to help

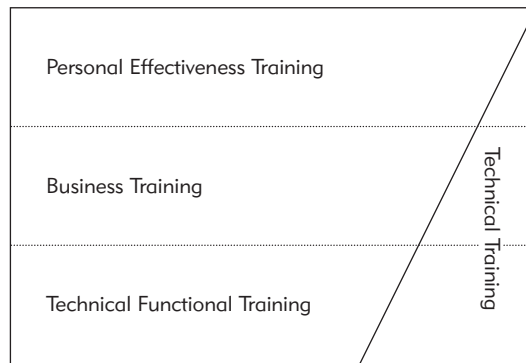
employees overcome that resistance: offer business training as part of their portfolio. Because the vendor is respected in the technical community, and respect and trust go a long way, they are able to leverage their reputations and have instant credibility for other types of training.

Training professionals, internal or external to a company, should recognize that technical experts process information and learn a certain way. They are most influenced by data and information, as Paraglider (1995) points out:

“A ‘typical’ engineer decides to take up the flute. Two weeks later, he (the typical engineer is still male although this is slowly changing) will be able to expound on the relative merits of conical and cylindrical tubing and their effects on the harmonic structure in the top octave, but he will still play like any other rank beginner—all wind and no toot. This illustrates the engineer’s ability and need to assimilate data and to intellectualize an activity. Unless the aim of a training event is to change this learning style, the trainer is well advised to cater to it and be prepared to provide all the necessary facts and arguments early in the proceedings. This is not as reactionary as it might at first appear. It is merely recognizing that, in engineering, the heart follows the head, and, if you would inspire your technical team to change their approach, you should first help them to the intellectual conviction that a change is a good idea.”

Explaining how a certain technology is deeply engrained in business processes may help technical experts see the value of business training. Additionally, tying facts to a larger, logical framework, model or system like ISO 9000, the Capability Maturity Model (CMM), or a customer relationship system is helpful. Technical experts need tangible approaches, processes, and frameworks to recognize the significance of business training and apply it to their work.

In summary, a well-rounded employee needs to understand three key areas: his or her job (technical functional training), his or her self (personal effectiveness training), and his or her company (business training) to be effective. Technology touches all three categories to a varying degree.

Figure 1.1. Training Categories

Technical training can be considered a vertical tier that, depending on the type of skill or function, is more or less present. As an example, desktop training is becoming commoditized and is more frequently considered personal effectiveness training, albeit with a technical aspect. Another example of personal effectiveness training with a technical aspect is training on presentation delivery. Not all personal effectiveness training involves a technical aspect, but many do. Business training may also have a technical aspect. For example, resource allocation tools may be introduced in a resource management course or proper equipment usage may be the focus of safety training. While all training categories have a technical aspect, technical functional training tends to have a higher technical aspect or content than personal effectiveness or business training. (See Figure 1.1.)

Analogous Content Types

All four types of training—technical, technical functional, personal effectiveness, and business training—teach analogous, or similar, types of content: procedures, concepts, factual information, and processes. While process training and new hire training are often characterized as training categories, they are actually examples of content and audience types, respectively. Ruth Clark (2007) defines each of these content types as follows:

- Procedure—“a series of clearly defined steps that result in achievement of a job task” (p. 46)

- Concept—“a class of items that shares common features and is known by a common name” (p. 65)
- Factual information—“unique, specific concrete items, specific data, or one-of-a-kind associations among concepts” (p. 95)
- Processes—“descriptions of how things work” (p. 121)

Each of these content types is found in all four types of training, as shown in Table 1.1.

Table 1.1. Training Categories by Content Types

<i>Content Types</i>	<i>Training Categories</i>			
	<i>Technical</i>	<i>Technical Functional</i>	<i>Personal Effectiveness</i>	<i>Business</i>
Procedure	Performing maintenance on a car	Applying for health insurance	Providing performance feedback	Entering budget numbers
Concept	Emission	Insurance plans	Integrity	Zero-based budgeting
Factual Information	The average passenger car emits 11,450 lbs of carbon dioxide	The monthly rate for individual health insurance is \$193	1 out of 4 managers gives regular feedback	The increase over the previous year’s budget is 4 percent
Processes	Material replacement in a manufacturing plant	Processing a health insurance claim	Providing step by step feedback to a low performer	Integration of new hires into a finance organization

Incorporating the four examples from the beginning of this chapter into the four training categories yields the following answers:

- The technical leadership course would be part of the personal effectiveness curriculum.
- The Sarbanes–Oxley training would be part of the business curriculum.

- The project management training would be part of the technical functional curriculum despite the use of an application or tool.
- The Cisco security training would be part of technical functional curriculum for IT professionals, but technical training for any other audience.
- The maintenance manager training should be on the technical curriculum.
- Whether the Microsoft Word training is put on the technical training or professional skills curriculum depends to a large degree on the maturity of IT skills in a company.

In ASTD's Benchmarking Forum (BMF) the training content areas that companies gave the most attention to were profession and industry specific (21 percent) and IT and systems (19 percent). Processes, procedures, and business practices (12 percent), managerial and supervisory (8 percent), and "other" (quality, product knowledge) (8 percent) were the next highest-used content areas (ASTD, 2009). If the four categories of training defined here are overlaid to ASTD's BMF content areas, an interesting picture is painted. From the order of spending, companies consider technical and technical functional training priorities, thereby confirming the prevalence and importance of technical training (ASTD, 2009):

- Sixty percent of training in the BMF analysis was related to technical training (including IT training) or technical functional training [BMF groupings: profession and industry specific: 21 percent, IT and systems: 19 percent, other: 8 percent, sales: 6 percent, and customer service: 6 percent].
- Twenty-three percent of training was related to personal effectiveness training [BMF groupings: managerial and supervisory: 8 percent, executive development: 4 percent, new employee orientation: 2 percent, basic skills: 4 percent, interpersonal skills: 5 percent].
- Seventeen percent of training was related to business training [BMF groupings: processes, procedures, and business practices: 12 percent, mandatory and compliance: 5 percent].

Technical Training and Related Activities

As if the differentiation and categorization of different types of training were not confusing enough, there are some distant cousins of technical training that are either called technical training but are not, or are not called technical training but are.

Product Development

As new products and services are designed and developed, there is a fine line between engineers sharing new conceptual ideas and producing so-called training materials. What starts out as a PowerPoint presentation to executives or management is often turned into material for training hundreds, if not thousands, of employees. The only thing missing may be the formal student enrollment, fancy course materials, and evaluation sheets as peers will be invited through e-mail, will hear a presentation, and will skip the evaluation. Adult learning theory and instructional design concepts are ignored, and slides become teaching aides—at times to the annoyance of the training organization. In some companies, mostly creative or start-up companies, this approach is encouraged; in many other companies, especially where following formal roles and responsibilities is encouraged, it causes conflict. The questions in both types of environments are: Where and when does sharing new technology, processes, or products turn into technical training? When should the training organization become involved? And when should the ownership for skills development for a particular technology, process, or product be transferred from the technical experts to the training professionals? As is often the case with technical content, it is not always clear when technical expert information and content should be formalized into technical training, and the perspective varies by company.

As a rule of thumb, the technical experts should own all aspects of the product life cycle (which typically includes the following four phases: exploration, planning, development, and deployment), but involve the training experts early on. It is critical that training professionals be brought along in the process to build the delivery process for technical knowledge and make key training-related decisions around prioritization, funding, vendor engagement, delivery methods, and so forth. By participating in conversations with and building

the technical knowledge of training experts, technical experts feel their training partners understand what they are trying to accomplish and are more willing to partner on the content and hand over training development and deployment.

While early inclusion and partnership are ideal, the reality sometimes looks different. For example, if a product is brand new and there is a very short window to get it to market, technical experts document details and features as best they can and use this information as training and presentation aids, since no other materials exist and no time can be wasted. The newer the product, for the company or the market, the higher the stakes and the less likely technical experts are to let go of training. Once a product or service has been around for a while and the risk is lower, content development tends to be moved to less experienced employees, and technical experts may be relieved when the training organization steps in. While many training experts do not appreciate this approach, it is a reality in many companies.

Customer Training

Building the technical skills of customers and partners, in addition to internal employees, is an important consideration and can be a form of technical training. To include customers and partners as stakeholders in the training process can be strategically important for demand creation, marketing efforts, relationship building, and cost control. This type of training is often referred to as end-user training, customer training, partner training, or product training. When training covers the entire supply chain, it is referred to as training the extended enterprise. “Organizations are increasingly focusing on the development of talent not just within their own organizations, but across the wider supply chains. Training the organizations’ key employees remains vital in our highly competitive environment, but impacted by the credit crunch, organizations are increasingly investing some of their training dollars in individuals who really impact the bottom line across their broader value chain. Extending the function of a learning department to encompass training for customers and partners helps to maximize the impact of the learning spend and makes good economic sense” (Neale, 2008). For mature products, customer content can even be used for internal training. If the technical training organization owns all aspects of technical training (from employees

to customers and partners), then the overarching term “technical training” is accurate; if that is not the case, the different types of training are best referred to by their respective terms.

To ensure success and avoid the assumption that one size fits all, a careful needs analysis needs to be conducted. Things like company culture, attitudes toward technical training, geographical distribution, and availability of technology may be drastically different in customer or partner organizations and may need to be assessed. What works in a manufacturing organization may not work in a retail organization. However, the analysis may reveal that training content and delivery can be similar across constituents and may make the most sense, cost wise, especially if customers are charged for training, which offsets the development and delivery costs. According to Nick Howe, vice president of Hitachi Data Systems (HDS) Academy, using identical processes for technical, non-technical, employee, and customer training in terms of requirements gathering, delivery, and “go to market” is a cost-efficient way for HDS to get economies of scale.

While some companies use the same content and materials for all stakeholders, it is not uncommon to see higher-quality training material used for customers. Training for customers directly impacts the bottom line and is targeted to increase revenue, customer loyalty, and/or productivity, causing training organizations to spend more time and money on the design. Additionally, training that is delivered outside the walls of the company reflects on the quality of the company and, of course, everyone wants that to be a positive impression. While technical training for employees is less likely to be cut than non-technical training during a downturn, technical training for customers and partners, as opposed to technical training for internal employees, is even more bullet proof.

Technology and Computer-Based Training

When one of the authors tried to gather information on technical training at a major industry conference for training, she was consistently referred to vendors of computer-based training (CBT), technology-based training (TBT), and learning management systems (LMSs) and solutions. Not one conference attendee or exhibitor thought of technical training from a content perspective.

Distinguishing TBT from CBT and from LMS is clearly an exercise in semantics. The definitions used in this book are as follows:

- *Computer-Based Training (CBT)*—A form of training delivery involving use of a computer.
- *Technology-Based Training (TBT)*—A form of training delivery involving use of technology. It includes both computer-based training (CBT) and web-based training (WBT) as well as other technology such as Internet, satellite broadcast, audio or videotape, or interactive television.
- *Learning Management Systems (LMS)*—Software or web-based technology for training administration, content management, training delivery, evaluation, and/ or other learning functions.

As is evident from the definitions, technical training content can be housed in any of the three. While CBT is clearly related to content housed in a software program on a computer, TBT is related to content housed in technology in a broader sense. While LMSs used to be primarily training enrollment and tracking tools—carrying out administrative functions—they are now designed to be complete training systems, including content development. Therefore, training content, including technical training content, can be housed in an LMS also.

The word “technology” in the title of TBT further adds to the confusion. What TBT really refers to is technology and web-based training. The difference between technical training and TBT is that the technical part in TBT lays in the delivery, whereas the technical part in technical training is in the content. The content of a TBT course can be technical or non-technical, depending on the subject matter covered.

Human Resource Generalist Work

Weatherly (2004), in a SHRM article, states that the role of the HRD function is to “ensure that the current and future knowledge, skills, abilities, and performance needs of the workforce are understood and can be achieved within the timeframe required by the organization. This is accomplished through processes and programs designed to address employee training,

change and performance management initiatives, and other development needs that may be unique to specific employee groups within the organization.” Most companies apply the definition of HRD as defined by Weatherly. However, as Swanson and Holton point out, “As with any applied field that exists in a large number and variety of organizations, HRD can take on a variety of names and roles. This can be confusing to those outside the profession and sometimes confusing to those within the profession” (p. 12). One example is that some companies use HRD and related job titles, such as human resource development representative (HRDR), to describe the work of HR generalists who are not actually involved in training and development activities. Other companies use the term HRD more broadly to describe any development—development of employees through training as well as development of organizations, referred to as organization development (OD). Training tends to focus on individuals or groups of employees, whereas organization development focuses on the company or organizational unit as a collective and can often be found as a separate HR function.

Summary: The Power of a Common Language

One of the principles we advocate in this book is the need to create a common definition for technical training and other types of training that facilitates a common language between training and its stakeholders. This would ensure a common understanding of what the business is trying to achieve, relative priorities, the role of technical training, and so forth. The power of a common language has been recognized by many and is summarized well by Robert Bogue (2006):

“The foundation for creating less rework is in developing a common language that you can use to communicate as clearly as possible. It will never be perfect, but having the same understanding of a word will radically improve your chances of fully understanding what someone else is communicating.”

Once definitions for technical training and other types of training are available, the training organization can use those to create a training taxonomy, a hierarchy of categories used to classify training data, course materials,

and other information. Using the definitions offered in this book would yield the following training categories or taxonomies: technical training, technical functional training, business training, and personal effectiveness training. The categories enable scope definition, stakeholder assignments, target audience classification, competency definitions, curricula design, and deployment approaches. They are core building blocks for building a first-class, systemic, and proactive (rather than reactive) technical training organization.

A training taxonomy, like any other taxonomy within an enterprise, needs to be flexible and practical. “A classical taxonomy assumes that each element can only belong to one branch of the hierarchical tree. However, in a corporate environment, such formal ordering is neither feasible nor desirable” (Woods, 2004). For example, a course in lean manufacturing—while not ideal—could be listed on the technical training curriculum for engineers and operators, not just on one or the other, since the topic is likely of interest to both groups.

As important as defining technical training and supporting training taxonomies are, so is the need to differentiate technical training from related activities. The term “technical training” should only be used for activities that truly are technical training. It is the training professionals’ charter to clarify:

- What technical training is and what it is not.
- Where product development ends and technical training begins.
- That technology enables technical training, but by itself is not technical training.
- That the term human resource development should be reserved for training activities, not general HR activities.
- That product and customer training can be part of a technical training organization’s scope.

Now that a definition of technical training has been offered and there is an understanding of what technical training is, the challenges and opportunities associated with technical training can be explored next.