

SSMI's Operational Guidelines for Leadership Development



Abstract

This paper discusses the leadership development process used by the Six Sigma Management Institute (SSMI) to train and certify Six Sigma practitioners. Although the related certification process is constrained to Black Belts and Green Belts, certain steps within the process are also applicable to several other SSMI training programs. Essentially, the certification process consists of two stages: Proficiency Certification and Project Certification. The proficiency certification is granted upon successful completion of an extensive knowledge exam and intensive digital DMAIC project exam. The project certification requires the successful execution and validation of at least one value-based Six Sigma project approved by the student's sponsoring organization. Taken together, the two certifications constitute a de facto professional certification. In this context, the training organization is responsible for ensuring compliance to the knowledge requirements, while the student's sponsoring organization is responsible for ensuring conformance to the project requirements. In this manner, the benefits of a Six Sigma credential are extended to a wider audience while concurrently ensuring curriculum integrity and value-based returns for the sponsoring organization.

Introduction

Recognized for their ability to identify, plan and realize targeted improvements, Six Sigma practitioners have become experts at reshaping the competitive landscape of many well respected businesses within the world economy. Of course, many of these individuals have

distinguished themselves by earning an X-Belt credential, where X stands for the ranks of White, Yellow, Green and Black. Within the world of Six Sigma, this mark of formal distinction often constitutes a type of *de facto* professional certification. In this context, a professional credential represents a form of personal accomplishment and symbolizes a certain level of competency. Hence, such credentials serve as artifacts that evidence one's scope and depth of knowledge. The pursuit of credentials not only brings great benefit to the individual; credentials also convey substantive value to employers.

For the individual, a Six Sigma X-Belt certification can yield a host of personal and professional benefits, such as higher pay, vertical mobility and job satisfaction. From the employer's perspective, internally certifying X-Belts represents a mechanism to identify and develop high-potential players within the organization. Along the same lines, certification is also a meaningful way to rapidly standardize and institutionalize selected core values.

Generally speaking, an individual can achieve a Six Sigma X-Belt certification by way of a two-stage process. The first stage is related to training, while the second stage is linked to application. While the first stage is focused on transferring knowledge, the second stage is concerned with developing on-the-job experience.

Although treated independently during execution, the combined influence of both stages is highly interactive. Without question, the two mutually reinforcing stages can deliver a synergistic effect, often terminating in X-Belt certification. While the training organization certifies a student's base of Six Sigma knowledge, the sponsoring organization certifies the student's ability to apply that knowledge in a purposeful and meaningful way. This approach is illustrated in figure 1.

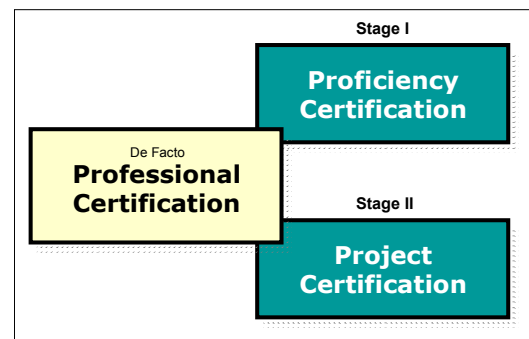


Figure 1. Core Stages of the SSMI Six Sigma Leadership Development Process

However, in far too many cases, the pragmatic benefits of certification is lost or significantly delayed because the trainee: a) was assigned to an inappropriate training program; b) did not have access to an on-the-job project; c) was made responsible for an improperly scaled project; d) was not provided adequate resources or coaching; or e) some combination thereof.

Almost without saying, such shortcomings may disillusion and frustrate the student, as well as the sponsoring organization. Sometimes this effect is so severe that the proverbial baby is thrown out with the bathwater, so to speak.

To this end, the Dr. Mikel J. Harry Six Sigma Management Institute (SSMI) has developed a training and certification process that is fully consistent with the traditional two-stage approach, yet avoids virtually all of its classical limitations.

Essentially, the SSMI certification process requires that a student first complete all of the SSMI training requirements. Upon successful testing, the student is then *Proficiency Certified* by SSMI. Next, the student completes a value-based project. Following this, the project must be validated by the student's sponsoring organization.

Once the validation cycle has been satisfactorily executed, the student is then *Project Certified* by the sponsoring organization. Thus, we have the two components of a *de facto* professional certification for the practice of Six Sigma.

Proficiency Certification

During the first stage of proficiency certification, an X-Belt candidate receives fundamental instruction in the concepts, tools and methods of Six Sigma. The student accomplishes this by way of live classroom training or computer-based instruction.

Naturally, testing of the student after each instructional topic ensures the proper scope and depth of comprehension. Upon successful examination of all program topics, the student is then *Program Qualified*. For example, *Black Belt Program Qualification*. This level of qualification can be realized for all SSMI programs-of-study.

The next step toward a proficiency certification involves demonstrating a mastery of the tools and methods defined within the X-Belt's curriculum. This is accomplished by way of a simulated project, also called the "application project," or "training project" as some would say.

Conventionally speaking, an X-Belt's on-the-job project is executed in 5 distinct but interrelated phases. Namely, the progressive phases are Define, Measure, Analyze, Improve and Control. This method is commonly referred to as the "DMAIC" problem solving process. Figure 2 presents the DMAIC strategy for project execution and problem solving.

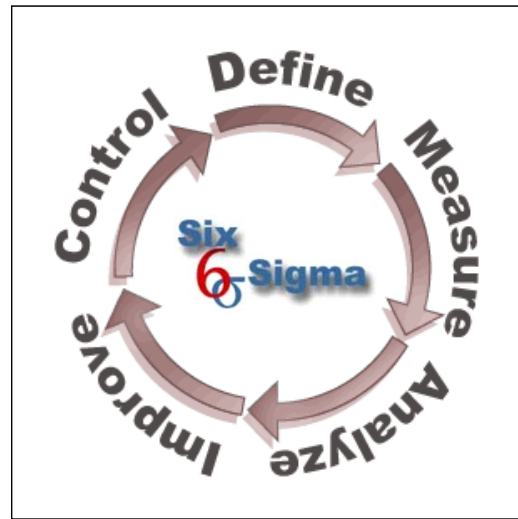


Figure 2. The DMAIC Cycle for Six Sigma Project Execution and General Problem Solving

By careful design, the SSMI digital training project bridges the gap between a student's conceptual knowledge and the real world.¹ This provides a means to fully exercise the curriculum's tools and methods, but done so without the restrictions and nuances commonly associated with actual practice.

From this perspective, the training project integrates and interrogates a student's base of Six Sigma knowledge without the usual career implications typically associated with on-the-job practice. Upon successful completion of the project-based exam, the student is then *Project Qualified*. For example, *Black Belt Project Qualification*.

Expressed differently, a project qualification means that the student is now technically

¹ Essentially, the SSMI digital training project connects training to application through a data-centric DMAIC case study. To fully execute this case-based training project, the successful student must utilize the supplied data, apply the related Six Sigma concepts and tools, and then draw the appropriate conclusions. In turn, the conclusions are used to answer various questions presented within the Application Exam. Given that the student achieves a satisfactory score on this exam, SSMI issues a proficiency certification. Thus, the SSMI Proficiency Certification = SSMI Program Qualification + SSMI Project Qualification.

competent to execute live Six Sigma projects. It also means that this competency has been validated by way of rigorous testing. This level of qualification is restricted to the SSMI Black Belt and Green Belt programs-of-study.

Once a prospective Black Belt or Green Belt has been fully trained and successfully tested (i.e., both program qualified and project qualified), SSMI issues a proficiency certification. This certification stands as a formal testament to the student's mastery of the SSMI Lean Six Sigma Body-Of-Knowledge (LSS-BOK).

Naturally, this certification means that the student has successfully demonstrated a verifiable command of the terminology, concepts, tools, methods and procedures associated with the related LSS-BOK. It also means that the student is fully qualified to execute an actual on-the-job DMAIC project.² Thus, the student has proven his or her intellectual ability and the capability to execute a value-based Six Sigma project.

Project Certification

There is no substitute for the experience of on-the-job application. Without question, Six Sigma projects benefit the X-Belt as well as the sponsoring organization. Through an application project, the Six Sigma X-Belt practitioner can demonstrate the value of his or her skills to the sponsoring organization, as well as to themselves. A Six Sigma application project is the point where the proverbial *rubber of training* meets the *road of reality*, so to speak. Of course, the notion of success is a relative thing. To this end, SSMI believes that a Six Sigma project can only be purposefully defined, reviewed, and approved by the sponsoring organization.

By definition and conventional practice, a valid Six Sigma certification project must return some form of tangible, measurable and verifiable benefit for the student's sponsoring organization. Only those activities that deliver hard forms of

² From a historical perspective, on-the-job projects are executed in parallel to training. This parallel deployment strategy has yielded many great successes, but also suffers from several consequential shortfalls. For example, a live on-the-job project may not be available to the student at the time of training. Even if a project is available at the time of training, the meaningful synchronization of the training curriculum and application project is often lost, owing to the project's scale or execution requirements. In such cases, the student's learning does not align to the actual timetable of the project. Yet in other cases, the student's on-the-job project is cancelled in the middle of training, owing to a host of unforeseen issues. Still other individuals seek a certification, but their employer has not yet embodied Six Sigma. As a consequence, the student can not satisfy the project requirement for purposes of certification.

value should be considered for purposes of project certification. In other words, only accounting-quantifiable problems should be placed in the pool of assignable X-Belt projects that are used as a basis for professional certification.

Again, only the student's sponsoring organization should make this determination, simply because such value-based projects are a *business issue*.³ Therefore, it is the sponsoring organization that should say whether or not a particular problem constitutes a Six Sigma project.⁴ In addition, a Six Sigma project must conform to a standardized set of performance criteria, often taking the form of project review tollgates. A tollgate is simply a progressive set of success criteria that must be satisfied before a Six Sigma project is allowed to continue through the DMAIC process.

In other words, tollgates are associated with the key milestones along the path of project planning and execution. Common milestones are inclusive of, but not limited to: a) project selection and initialization activities; b) the DMAIC improvement process; and c) project validation and closure procedures. Here again, only the sponsoring organization should define the nature of such things.

Six Sigma tollgates ensure the judicious and timely planning, approval, execution, review, verification, and closure of the X-Belt's project. In addition to tollgates, Six Sigma projects must be tracked in an effective and efficient manner. To facilitate this activity, it is often necessary to employ some type of Six Sigma tracking and reporting tool. Figure 3 provides a screen capture for such a tool.

³ For more information about Six Sigma projects, the reader is directed to Harry, M. J. and Schroeder R. (1999). *Six Sigma: The Breakthrough Management Strategy Revolutionizing the World's Top Corporations*, Doubleday, Random House Inc. New York, New York. Additional information can be found by referencing Harry and Linsemann (2005). *The Six Sigma Fieldbook: How to Successfully Implement the Six Sigma Breakthrough Management Strategy*. Doubleday, Random House Inc. New York, New York.

⁴ This stems from the pragmatic belief that a proficiency certification (per say) is best administered by the respective training organization while the project certification should be directed by the student's sponsoring organization. Only the sponsoring organization can meaningfully assess the business feasibility of a potential Six Sigma project. Simply stated, training professionals should govern the process of proficiency certification, while business professionals should oversee the process of project certification. Therefore, it is the sponsoring organization's responsibility to determine whether or not a prospective project has the right scope and depth and whether or not it can return a bottom-line, measurable and verifiable benefit. Clearly, this is the business of management, not trainers, consultancies or professional societies.



Figure 3. Streale Enterprise Project and Reporting Tool

Naturally, the success criteria associated with each tollgate is established by the sponsoring organization. As would be expected, the success criteria vary organization-to-organization and are usually established in the light of prevailing business needs, management philosophy, operational requirements and organizational policies.

Without exception, Six Sigma projects should be properly defined and appropriately scaled. By design, such a project should address some type of process-centric problem that ultimately connects to a business goal. Only when such a project is successfully validated and closed should the sponsoring organization grant final approval.

Upon the successful closure of a Six Sigma project, the X-Belt would be officially *Project Certified*. For example, *Black Belt Project Certified*. Again, it is the sponsoring organization that should have the formal authority for granting this particular credential. Of course, such a credential can assume one of several forms, such as a letter of project completion, certificate of validation, and so on. The exact form of the credential is not as important as what it conveys.

Training Platform

As previously stated, training is a key component of the *SSMI Roadmap for Leadership Development*. In support of this aim, SSMI has developed a world-class Lean Six Sigma Body of Knowledge and organized the related content into a master curriculum. By virtue of the curriculum's modular design, the various Six Sigma roles can now share a common core of knowledge and information. SSMI's knowledge transfer system is a training tool called

"MindPro®". Of course, this web-based display of this tool can be custom branded for any organization (see figure 4.0).

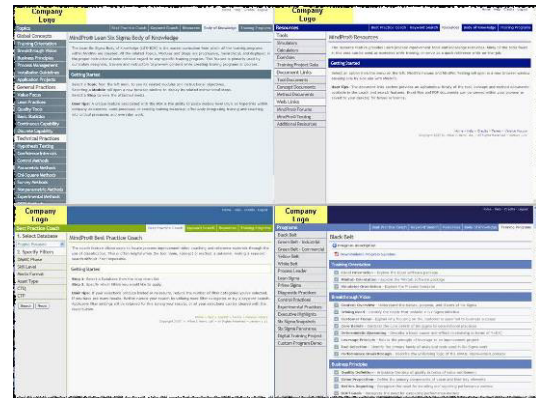


Figure 4.0 Custom Branding of Display Pages

More specifically, MindPro® is a web-based training tool designed to provide students with full access to the total SSMI Lean Six Sigma Body of Knowledge (LSS-BOK). In addition, MindPro® can be effectively employed as a powerful coaching and mentoring tool, or as the primary base for a blended learning model. In this regard, MindPro® is a complete Six Sigma knowledge transfer system.



Figure 4.1 MindPro Training Programs Tab

This means that the MindPro® Knowledge Transfer System is a highly innovative, dynamic, video-based training and coaching system that offers a full range of Six Sigma and business process improvement programs and functionality (see Figure 4.1). The training programs and supporting curriculum offered within MindPro® have been fully endorsed by such notable

institutions as Arizona State University, Society of Manufacturing Engineers, Korean Standards Association and successfully used by several well known corporations and many individuals.

In conjunction with several internationally recognized Six Sigma subject-matter-experts, this author (Dr. Mikel J. Harry) was able to develop a modular, business-centric yet competency-based architecture for all forms of Six Sigma training. The resulting curriculum and personalized teachings were integrated into the MindPro® Learning System. Of interest, this digital training approach represents over two years of exhaustive research, intensive development and carefully prescribed testing.

The MindPro® web-based video delivery system has been specifically designed to provide self-paced, high-quality, low-cost, on-demand, role-based Six Sigma training, as well as traditional business improvement methods and tools. It prepares Six Sigma Black Belts, Green Belts, Yellow Belts and White Belts to pass SSMI's program and project qualification exams.

MindPro® also includes a wide array of features to facilitate the learning process, including various calculators and simulators, as well as an integrated search feature. Taken together, these features constitute an extremely powerful instrument for developing, reinforcing and advancing a student's portfolio of Six Sigma knowledge and skills. Figures 6 and 7 displays screen shots of how the instructional content is reinforced for optimal comprehension and understanding.

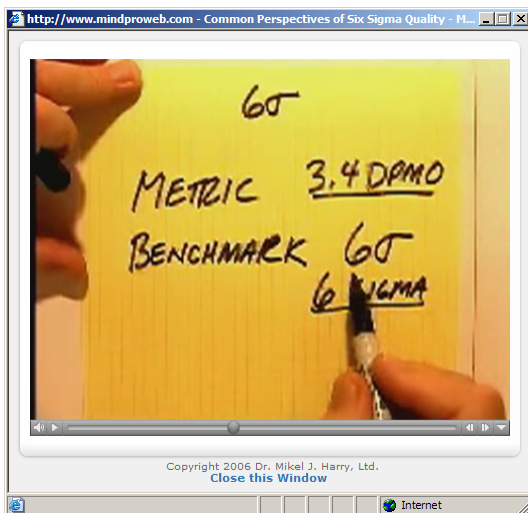


Figure 5. Dr. Harry's Over-the-Expert's-Shoulder (OTES) Style of Instruction

To this end, Six Sigma practitioners are better able to consistently deliver phenomenal and visible cost savings to the bottom line. Figure 5 highlights one of the video lectures contained within MindPro®.

Owing to the highly innovative design of MindPro®, it is now possible for virtually any business enterprise, institution, or governmental agency to fulfill a wide array of Six Sigma training needs, on any level, to any extent.

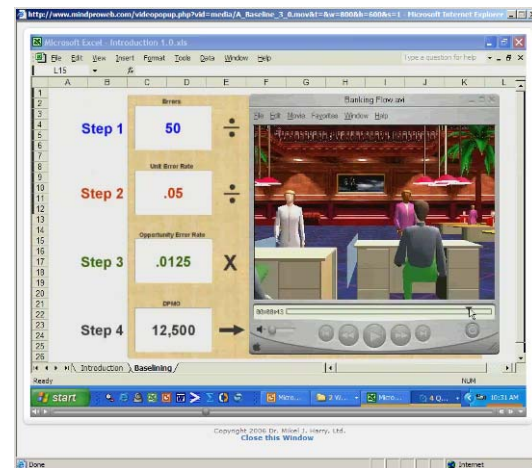


Figure 6. Example Video Connecting Instructional Content to Real-World Applications

Through MindPro's wide range of functionality and its many compelling features, students are far better postured to maximize the learning experience – at their own pace, any time, anywhere. Of particular interest, MindPro® can be employed by an organization (of any size) to efficiently deploy Six Sigma in an extremely cost effective manner.

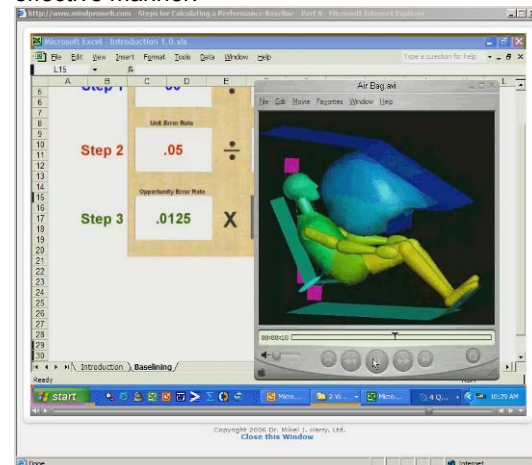


Figure 7. Example Video Connecting Instructional Content to Life-Like Simulations

In this regard, MindPro® can be used as the foundation for implementing: a) fully self-directed training; b) a blended learning model; c) distance coaching and mentoring; or d) any combination thereof. Of course, this represents a highly cost effective solution that maximizes deployment and implementation flexibility, for any organization, from any industry, of any size.

Leadership Development Process

This author has long advocated that Six Sigma is an ideal way to develop a world-class workforce of business leaders. In his sense, Six Sigma is an HR proving ground, not just a business improvement tool. To this end, SSMI has developed a Six Sigma leadership development process that leads to role-based Six Sigma certifications. As previously stated, this process is based on a two stage, four phase certification strategy. The four progressive phases are presented in figure 8.

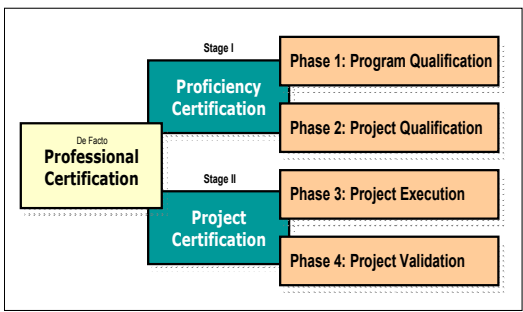


Figure 8. The SSMI Six Sigma Leadership Development Process

Program Qualification

Step 1: Personal Evaluation. The optional personal evaluation helps an unsure student determine whether he or she should proceed with one of the higher order training programs such as Black Belt and Green Belt, or instead consider a less intensive program like Lean Sigma or Quick Sigma. The focus of the evaluation is to determine if the student possesses the prerequisite arithmetic knowledge and skill necessary to successfully complete Black Belt or Green Belt training.

The prospective student can take the personal evaluation free of charge by going online and

visiting the MindPro® Evaluation Center at www.MindProTesting.com. At this website, the prospective student will be able to access the exam, answer the related questions and immediately receive their scores. Based on the exam report, the student will then be able to interrogate their performance and conduct a personal gap analysis so as to identify any deficiencies. Figure 9 displays the MindPro® Evaluation Center home page.



Figure 9. The MindPro Evaluation Center

The evaluation exam is quick and simple. It consists of 85 true/false questions. The questions are related to basic arithmetic operations, such as addition, subtraction, multiplication and division, as applied to whole numbers, fractions and decimals. The exam uses a traffic light scoring system to make interpretation straightforward and easy – green, yellow, and red lights.

A green light is given if the student's score is greater than 90%. Essentially, this indicates that the student is adequately prepared to take on one of the higher order training programs like Black Belt or Green Belt.

A yellow light is signaled if the student's score is between 80% and 89%. Such a score would suggest that the prospective student should brush up on their basic arithmetic skills before proceeding with one of the higher order training programs.

A red light is signaled if the student's score is less than 80%. A score of this magnitude would imply that the candidate should likely not

consider X-Belt training, but rather focus on the Lean Sigma or Quick Sigma training. It would be certain to say that the student should acquire additional knowledge in basic arithmetic before proceeding with any of the MindPro® role-based training programs.

Step 2: Program Selection. During program selection, the student should first decide his or her professional needs and objectives. In turn, this will provide the essential guidelines for selecting an appropriate program-of-study or short-course. Next, the prospective student should review each of the program descriptions. By matching the various descriptions to individual needs and objectives, the student is then better enabled to determine which training program will best facilitate their personal and professional goals. Appendix A contains the various Six Sigma programs-of-study offered within the MindPro® Knowledge Portal.

Since the SSMI curriculum is modular and progressive in nature, the prospective student can enter one of the lower order training programs, such as White Belt, and then move on up to Yellow Belt, Green Belt, or even Black Belt status. In this sense, the curriculum architecture is much like a staircase. A student can start at the top (Black Belt) or climb up the ladder, starting at the base (Prime Sigma).

This particular step (Program Selection) would not be applicable for a student that has already assigned been a Six Sigma job role or training program by his or her management, such as in the instance of a corporate Six Sigma deployment.

In this case, the corporate management usually pre-selects one or more Six Sigma training programs and then judiciously determines which employees will receive that training. This is usually done in accordance to a centrally coordinated deployment and implementation plan. Of course, the specific nature and sequencing of such a plan will vary organization-to-organization, depending on the prevailing business needs and operational circumstances.

Step 3: Program Registration. Although program registration is optional, it is an essential step if a student seeks to capitalize on the full range of supporting resources available within the MindPro® learning system, such as the MindPro® Discussion Forum and the MindPro® Evaluation Center.

A student can gain access to the discussion forum by requesting a user login when they purchase a MindPro® program. The student will then be able to access the private discussion board to read and post content. However, certain corporate students might be directed to a different area of the discussion forum, but only if the sponsoring organization has opted for a private and hidden forum or a completely segregated forum.

Structurally speaking, the MindPro® Discussion Forum is broken into three components, as illustrated in Figure 10. The first component is private corporate forums that are hidden from general users. The second component is private forums reserved for MindPro® students. This particular area is dedicated to posting questions and answers related to the various SSMI training programs. The third area is specialty forums like Technical Support. All areas of the MindPro® Discussion Forum are periodically moderated by highly seasoned Six Sigma veterans – Master Black Belts, Champions, and Subject Matter Experts. In particular, many students find the peer-to-peer discussion to be quite useful.



Forum	Topics	Posts	Last Post
Private Corporate Forums			
Private Forums			
For instructor / student discussion and training related questions. Also utilized for technical support for MindPro, MindPro Forums and MindPro Testing.	80	63	Wed May 16, 2007 1:45 pm Sallan
Private Forums for MindPro Users			
Getting Started & Important Notices	2	2	Thu Feb 01, 2007 12:02 am Technical Support
How to Register, Join a category, and start using MindPro Forums. Also includes Important Notices for all users.			
Six Sigma - General Discussion	28	66	Thu Jun 07, 2007 9:13 am Technical Support
Six Sigma - Tools & Methods	11	24	Thu Jun 28, 2007 10:28 am Dr. Mikel J. Harry
Six Sigma - Projects	3	6	Fri Jan 26, 2007 8:04 am bookshelton
Six Sigma - Management Practices	0	0	No Posts
Six Sigma - Career Development	1	1	Mon Dec 18, 2006 9:32 am Ezekiel
Specialty Forums			
Technical Support	12	37	Tue Jun 26, 2007 8:51 pm Technical Support

Figure 10. MindPro Discussion Board Home Page
 To register for qualification and certification testing, the student is directed to the MindPro® Evaluation Center. The address for this center is www.MindProTesting.com. At this site, the student can access the appropriate knowledge and application exam packages. Of course, each topical exam related to the student's selected program-of-study must be satisfactorily completed before a credential is issued. Once registered, the student will receive an enrollment confirmation via email from the site administrator.

Step 4: Program Execution. After selecting an SSMI program-of-study from the MindPro® offerings and registering for the supporting services, the student is ready to commence

training. By way of the MindPro® Knowledge Transfer System each student is guided through a series of topics, modules and instructional steps.

At each instructional step, a video-based lecture, presentation, simulation or demonstration delivers the knowledge. The average runtime for a video is about five minutes. This short-cycle format has many advantages for students, i.e. watch a video during break, between classes or anytime they have a few minutes to spare.

Essentially, there are three types of content videos that convey knowledge – Instructional, Expansion, and Application. The instructional videos provide lecture-based knowledge. By design, each content video is self-contained, yet conceptually linked to its neighboring videos.

The expansion videos build upon the instructional videos and are intended to clarify, enlarge or supplement the student's understanding of the central concepts. Figure 11 exemplifies several different types of videos used within the MindPro® Learning System.

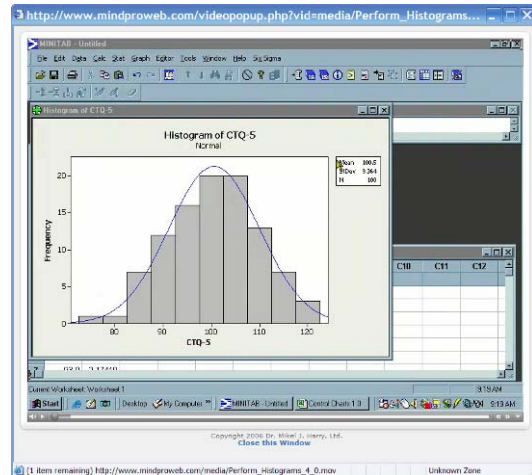
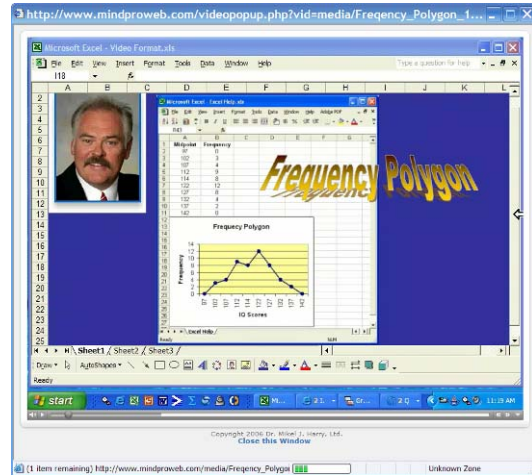
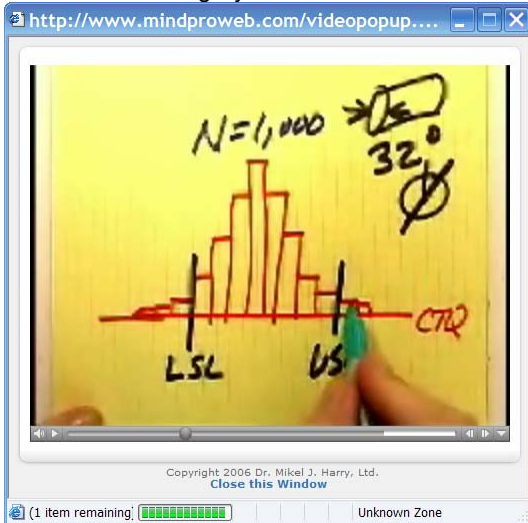


Figure 11. Examples of the Instructional, Expansion and Application Videos within MindPro
 In other words, the expansion videos can greatly increase the scope and depth of understanding (pertaining to one or more of the instructional videos) through dynamic simulations, movies, animations, and presentations. Finally, the application videos illustrate how the central ideas are played out using Excel and Minitab. Of interest, this is accomplished by way of a key-stroke-by-key-stroke demonstration.

In addition, there is a 3,000+ page statistical handbook associated with MindPro®. This extensive handbook utilizes hyper-linked text, thus making it a convenient and easy-to-use reference tool. MindPro® also has a powerful built-in search tool and coaching feature. Figure 12 illustrates the handbook.

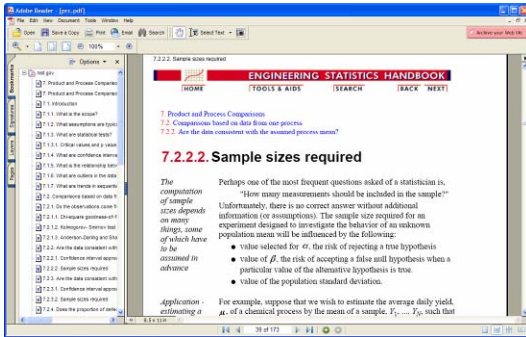


Figure 12. Screen Shot of the Statistics Handbook linked within the MindPro System

Step 5: Program Testing. For any given SSMI program-of-study contained within MindPro®, there is a corresponding set of performance tests.⁵ The related set of topic-based tests is collectively referred to as the *Knowledge Exam*.⁶ This exam applies to the ranks of White Belt, Yellow Belt, Green Belt and Black Belt. For example, *Black Belt Knowledge Exam*. It is also available for the Quick Sigma, Lean Sigma and Process Leader programs-of-study, as well as Diagnostic, Experimental, and Control Methods.

After watching all of the videos associated with a selected program topic, the student would then take the corresponding Knowledge Exam.⁷ The exam is at www.MindProTesting.com. It should also be noted that the SSMI Knowledge Exam does not cover the curriculum topic entitled "Training Project." This particular topic is only available for and designed to be undertaken by Black Belt and Green Belt candidates.

⁵ Testing is optional for each SSMI program-of-study, but if the student seeks an SSMI credential, the exams are mandatory. In the case of a corporate deployment, some students may be required to take the related exams by directive of their management (for a variety of reasons and purposes).

⁶ The Knowledge Exam is available to all students, regardless of their original training provider. For example, an individual might have been trained as a Black Belt by a particular consultancy or corporation, but was not offered the opportunity for qualification or certification testing. However, prior to taking the corresponding SSMI Knowledge Exam (e.g., Black Belt exam), the student is well advised to review the related SSMI curriculum. Thus, the student can ensure a sufficient alignment between their past training experience and the related SSMI curriculum and exams.

⁷ For any selected program-of-study, the related topic-based exams can be taken immediately following instruction, or the student can elect to complete all of the exams at one time. Generally speaking, the latter option should not be considered for the more intensive programs-of-study, such as Black Belt and Green Belt.

As would be expected, the SSMI Knowledge Exam is used to qualify or otherwise validate the student's comprehension and understanding. In order to successfully complete a selected Knowledge Exam, the student must score a minimum of 70% on each related topic exam.⁸ Figure 13 provides a screen shot that illustrates how the exam questions are presented to the student during the course of testing.

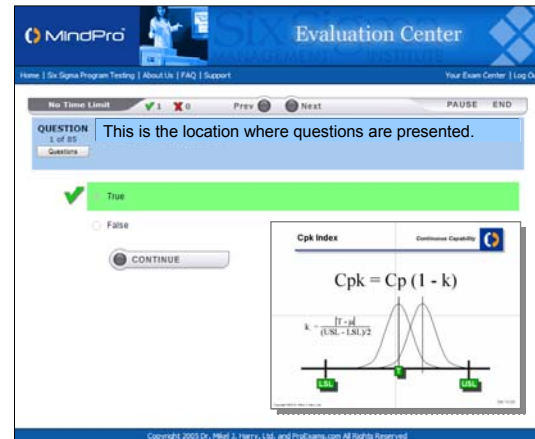


Figure 13. Example from the SSMI Knowledge Exam

If the student fails a given topic test, he or she then considers the possible reasons, goes back to the training material, bones up, and takes the test again. Any given topic exam can be taken up to three times. Of course, the third failure on any topic within the selected curriculum will result in program termination.

When the minimum score has been realized for each topic of the selected training program, the MindPro® system recognizes the graduating student with a letter of program qualification, signed by this author (Dr. Mikel J. Harry). For example, Green Belt Qualified or Lean Sigma Qualified, etc. This qualification letter constitutes an official recognition of the candidate's comprehension and understanding of the Six Sigma terminology, concepts, tools, methods, procedures and practices as it relates to their individual program-of-study.⁹

Through the Knowledge Exam, a student is better able to validate the extent to which he or she was

⁸ It should be recognized that a corporation can lower the minimum score of 70%; however, this will disallow that company from issuing a certification that is connected to SSMI or Dr. Mikel J. Harry.

⁹ For an individual that is enrolled in the SSMI Green Belt or Black Belt training, the student must also successfully complete the Application Exam in order to become Proficiency Certified.

able to digest and understand the curriculum content. In this context, each topic-based exam constitutes a source of instructional feedback. In addition, the various reports offered by the MindPro® Evaluation Center provide a sponsoring organization with an objective means to evaluate individual accomplishments as well as group performance. Furthermore, the exams can be used by an organization to benchmark their existing Six Sigma base of knowledge prior to launching a training initiative. This feature is also used to track student progress throughout the training program.

Questions related to each Knowledge Exam are straightforward and taken directly from the training material within MindPro®. Furthermore, all of the test questions are *True-False* in nature. If the student passes the test, he or she may begin the next topic. Each question on this exam is designed to independently or interactively interrogate a certain aspect of the SSMI Six Sigma body-of-knowledge; i.e., common terminology, key concepts, analytical graphs, statistical tools, application methods, and execution practices. Many of the questions are supported by illustrations, charts, graphs, diagrams, numerical tables, or Minitab output.

Project Qualification

Step 6: Project Training. Once a Black Belt or Green Belt candidate has been program qualified, he or she is then eligible for project qualification. This means the student has passed the related SSMI Knowledge Exam and is ready to proceed forward with the SSMI competency-based digital training project, or just “training project.”

The training project consists of two independent yet highly interactive components. The first piece is referred to as the *Application Case*, while the second element is called the *Application Exam*. In the interests of training continuity, the application case study (and related data) is presented to the student in accordance to the DMAIC cycle of improvement. Moreover, the case study is framed by a set of life-like business conditions and operational circumstances. In this sense, the collective body of “case facts” provides a rich context for executing the fully digital training project. Figure 14 provides an example display of the DMAIC digital training project format.

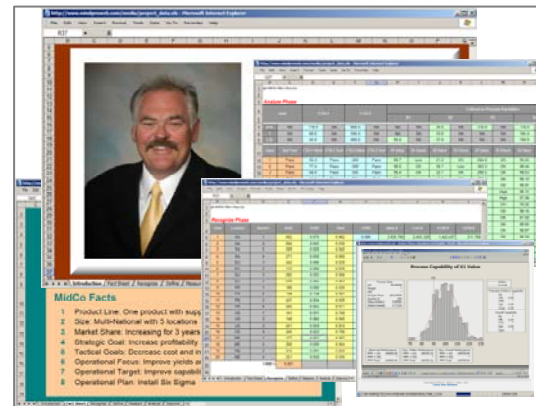


Figure 14. Selected Screen Shots of the MindPro Digital Training Project Case Study

The actual case study parameters and related performance data are fully discussed and exemplified by the supporting instructional videos. These videos are located under the curriculum topic called “Training Project.” Figure 15 exemplifies the training project videos.

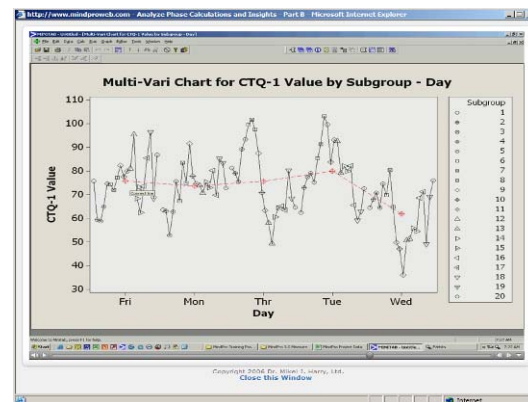


Figure 15. Example of the Instructional Videos that Support the SSMI Training Project

Of particular interest, the instructional videos provide the step-by-step actions that are necessary to execute each segment of Application Exam. In other words, the instructional videos discuss the various types of questions, as well as how to best answer such questions.

Step 7: Project Testing. Before taking the Application Exam, it is highly recommended that the student become familiarized with the supporting case study. As previously stated, the case study performance data is partitioned in accordance to the DMAIC strategy. Of course, the student uses the related data to answer

various questions as prescribed in the Application Exam. Figure 16 provides an example of the Application Exam.

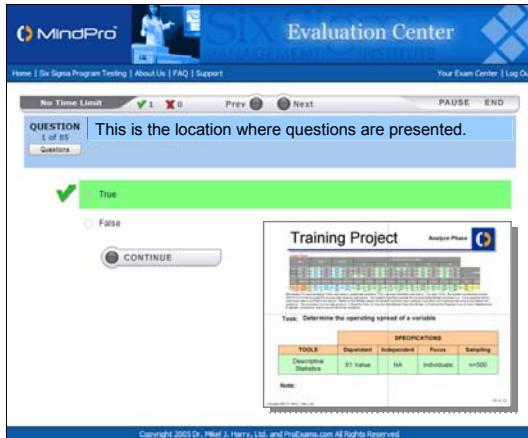


Figure 16. Example of the SSMI Application Exam

Upon completion of the Application Exam, the successful student is granted an official Proficiency Certification, signed by the instructor (Dr. Mikel J. Harry). For example: Green Belt Proficiency Certification or Black Belt Proficiency Certification.

Through the Application Exam, the Black Belt and Green Belt candidate is able to demonstrate and validate their ability to draw conclusions and make decisions through the application of Six Sigma tools, methods, and concepts. This means the student must exercise the case study data to discover performance patterns, discern relationships, and distinguish differences among and between key performance variables.¹⁰

The digital training project allows each student to independently bridge the gap between training and on-the-job application, yet done so in a standardized way. Thus, the training project provides a mechanism whereby each student can comprehensively apply their newly acquired Six Sigma knowledge, but done so on a level playing field with all other such students. Unlike the real-

¹⁰ As the student is guided through each phase of the training project, he or she is presented with an array of analytical conclusions set forth by several world-class experts. In turn, the student must exercise the case study data in accordance to their training, experience, and best judgment. Following this, they must draw their own conclusions and then determine whether or not their independent analyses and conclusions agree with those presented by the experts. Of course, some of the conclusions are true while others are deliberately made false. In all cases, the informed student will clearly recognize the valid conclusions as being true, while recognizing the improper conclusions as being false. In this context, the digital training project forces the student to apply the full range of concepts, tools, and methods associated with their respective curriculum.

world where project execution requirements vary widely and the selected tool set is discretionary, the digital project challenges each student to execute the same set of Six Sigma tools and answer the same questions.

This means that the training project can provide the types of instructional experiences and reinforcement that better prepares a student to take on live Six Sigma projects once he or she is back on the job. In other words, the training project and its related exam ensure that the student is *qualified* to take on real-world projects before such projects are assigned and executed. This strategy instills greater confidence in the student, as well as the student's sponsoring organization. Again, it should be noted that this particular exam is available only for the ranks of Green Belt and Black Belt.

When compared to a live on-the-job training project, the digital project better focuses and more thoroughly exercises the student's base of knowledge. It has this distinct advantage because the case study parameters and supporting data have been carefully designed to demand the application of certain predetermined skills and patterns of thought. During testing, these capabilities must be called into play so as to meaningfully answer the test questions.

Furthermore, the digital training project demands the application of a wider range of concepts and tools, whereas a live on-the-job training project generally uses only a few of the tools within the practitioner's larger basket of technical skills. While a live application project delivers an immediate value-based benefit to the sponsoring organization, it often misses the instructional aim (i.e., knowledge integration and reinforcement). On the other hand, a training project definitively reinforces learning but does not generate any immediate value-based benefits. Thus, the digital training project can help the student better learn how to:

- Translate practical problems into statistical problems
- Apply the DMAIC process in ambiguous situations
- Organize messy data and judiciously deal with incomplete data
- Apply many different tools to the same analytical situation

- Use dummy variables to facilitate the analysis of performance data
- Design, structure and manipulate raw data for subsequent analysis
- Modify, augment, group, transform, recode or otherwise edit raw data
- Perform common statistical analyses using raw and grouped data
- Interpret tabular, graphical and statistical outcomes
- Compare analyses resulting from continuous data to that of discrete data
- Develop a global picture by merging the outcomes of several independent data analyses
- Solve common classes of problems that Black Belts and Green Belts frequently encounter
- Make effective and efficient use of Excel and Minitab

Project Execution

Step 8: Project Selection. Six Sigma application projects must focus on business value, plain and simple. A valid on-the-job project must yield some form of tangible value for the sponsoring organization. As would be expected, the student must take responsibility for learning the Six Sigma tools and methods. On the flip side of things, the sponsor must take responsibility for identifying, selecting, assigning, reviewing, approving and closing Six Sigma projects. Only when these two conditions are realized and judiciously blended will mutual success prevail.

Naturally, a live on-the-job Six Sigma project must have the right scope and depth for a Black Belt or Green Belt. Only those projects that are capable of delivering hard benefits should be considered. In other words, a Six Sigma project should only be declared, activated and executed if it meets certain predefined decision criteria.

The general criteria for selecting a Six Sigma project are as follows: 1) the project has the proper mix of scope, depth and timing; 2) the project necessitates using the DMAIC improvement process to realize its projected

benefits; and 3) the targeted process and forecasted benefits can be clearly defined and are rationally measurable. A project should only be considered “viable” when these three criteria can be reasonably satisfied (in both spirit and body). Only then should that project be assigned to a qualified Six Sigma practitioner, such as a Proficiency Certified Black Belt or Green Belt.

Step 9: Project Activation. By conventional practice, a Proficiency Certified Black Belt (or Green Belt) must have completed at least one live Six Sigma DMAIC project as a part of his or her professional development. Without saying, the scope and depth of that project should be consistent with the X-Belt’s rank. Through on-the-job Six Sigma application projects, X-Belts are able to further validate and improve upon their technical and leadership knowledge, but in a real world setting.

In addition to the enhanced learning, Six Sigma projects greatly benefit the X-Belt’s sponsoring organization by bringing value-based benefits to the bottom line. To this end, it is strongly recommended that the X-Belt prepare a Six Sigma project charter, receive management approval and then execute the project in accordance with to the originating charter.

Generally speaking, a project charter is the cornerstone of successful execution. More to the point, completion of a charter signals the activation of a Six Sigma project. Once a project charter has been realized and approved by the sponsoring organization, the key elements for execution will have necessarily been identified, prioritized, and committed to a timeline. In this sense, the project charter is a fundamental management tool and should be carefully and judiciously prepared. This is not a simple “check the box” kind of activity. The importance of a Six Sigma Project Charter can not be overstated. Figure 17 displays one screen of an example charter.

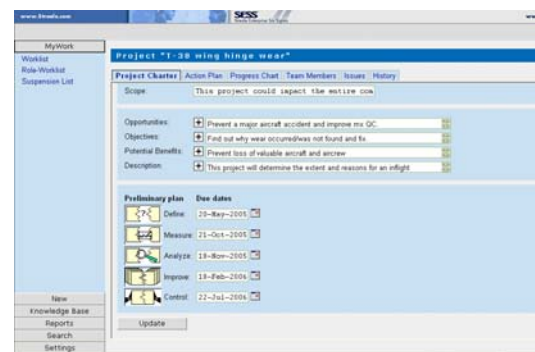


Figure 17. Streale Enterprise Project Charter Feature

Project Validation

Step 10: Project Review. It is firmly suggested that the X-Belt's sponsoring organization manage their Six Sigma projects through a formalized set of management tollgates. A tollgate is simply a set of success criteria that must be fully satisfied before a project is allowed to continue on to the next scheduled phase of execution. Normally, tollgate reviews coincide with each phase of the DMAIC improvement process.

Six Sigma tollgates ensure the timely and proper planning, approval, execution, review, verification, and closure of Six Sigma projects. Naturally, the X-Belt's sponsoring organization would seek to establish the success criteria associated with each tollgate – before the fact. Prevailing business needs, management philosophy, operational requirements and organizational policies often greatly influence the identification and adoption of success criteria.

As one would expect, such criteria will vary from organization-to-organization, depending on a host of business variables and constraining circumstances. Owing to the business-centric nature of such criteria, only the sponsoring organization's management can definitively say what constitutes project success. Thus, the management would be concerned with the *quality of business*, not the *business of quality*.

Step 11: Project Closure. After an X-Belt has successfully completed a Six Sigma DMAIC project, that project must pass through a final management review before it can be officially closed. In other words, the project activities and resulting benefits must be validated before it is formally closed.

Of course, the criteria for closure will vary organization-to-organization, but will normally revolve around satisfying one or more of the following needs: a) sustainable benefits; b) accounting verification; c) management approval; and d) technical validity, not necessarily in this order of priority. Generally speaking, a project can only be closed once the X-Belt's sponsoring organization officially declares that these needs have been reasonably satisfied.

Step 12: Project Documentation. As a normal course of business, the sponsoring organization often provides the X-Belt with some type of

formal document that confirms the successful completion and closure of a Six Sigma project. Such documentation can take the form of a letter or certificate, but does not reveal specific details about the project (in the interests of business confidentiality). Needless to say, such “artifacts of success” are quite important to the X-Belt. They are also meaningful for the sponsoring organization in that such documents can be used to facilitate personnel reviews and provide a trail of the employee's career progression and development.

Most normally, a successful project can only be authenticated or otherwise formally certified by a recognized member of the sponsoring organization's management team. For example, such an individual might be the X-Belt's immediate manager, the related process owner, or one of the organization's senior Six Sigma leaders (Champion, Master Black Belt and so on). Only at this point can the X-Belt legitimately declare a successful project – in a verifiable way.

It should go without saying than an external consultancy or professional institution is not meaningfully positioned to authenticate, validate or otherwise approve/certify the successful closure of an X-Belt project – for a wide array of business reasons. Such tasks are incumbent upon the sponsoring organization. Essentially, these matters are of a business nature and should only be decided by the management of that enterprise. While a consultancy can (and perhaps should) independently certify the knowledge base of an X-Belt, the practice of project closure and certification should be only be executed by the sponsoring organization.

Summary

This paper has discussed and illustrated the leadership development process used by the Six Sigma Management Institute (SSMI) to train and certify Six Sigma practitioners. Although the related certification process is constrained to Black Belts and Green Belts, certain steps within the process are applicable to other SSMI training programs.

Essentially, the certification process consists of two stages: Proficiency Certification and Project Certification. The proficiency certification is granted upon successful completion of an extensive knowledge exam and intensive digital DMAIC project exam. The project certification requires the successful execution and validation of at least one value-based Six Sigma project.

Taken together, the two certifications constitute a de facto professional certification. In this context, the training organization is responsible for ensuring compliance to the knowledge requirements, while the student's sponsoring organization is responsible for the project requirements.

In this manner, the benefits of a Six Sigma credential are extended to a wider audience while concurrently ensuring curriculum integrity and value-based returns for the sponsoring organization. Figures 18 through 21 provide various screenshots of the MindPro® platform capabilities.

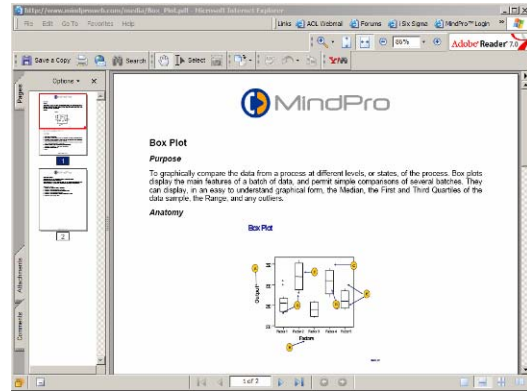


Figure 19. Tool-Concept-Method Documentation

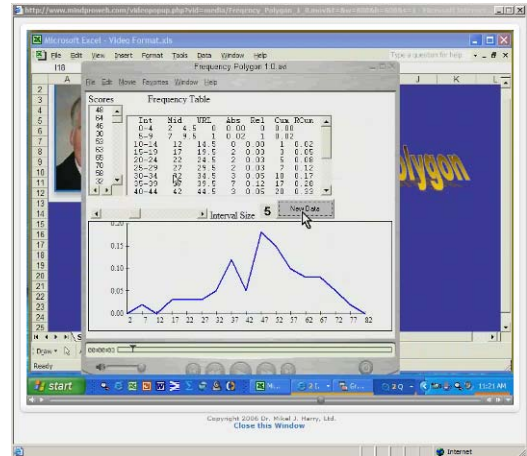


Figure 20. Statistical Simulations



Figure 18. Best Practice Coach



Figure 21. Key Word Search