

Performance: The Missing Ingredient in Technology Certification

In the rapidly changing world of information technology, certifications have arisen to augment or supplant traditional college degrees as the preferred way to measure proficiency. We have seen an explosion of certifications in the past decade for every technical topic from routers and switches to firewalls and programming languages. Microsoft, Cisco, and CompTIA have certified hundreds of thousands of individuals in their various credentials, and the market for test preparation and training just continues to grow. Why then are hiring managers unsure of the value of these certifications? Why do the industry magazines and websites continually feel the need to defend credentials against allegations of incompetent certification holders? Clearly, something is not quite right in the world of MCSE, CCNA and Network+.

Not all certifications are made the same. A few high-level certifications garner universal respect. The best known of these is the Cisco Certified Internet Engineer (CCIE). Only a few thousand people in the world hold this credential and the test to acquire it is legendary. The applicant has to pass not only a written test, but also a lab practical before they can become a CCIE. Furthermore, while two-thirds of applicants pass the written test, only about one in three pass the hands-on portion. What is it that sets this designation apart from most of the rest of the certification industry? To get at the answer to this question, we need to look at the purpose of certification and the structure of current exams.

Why Certification?

One purpose of certification credentials is to demonstrate the candidate's preparation to perform a particular job. The certification acts as a high-stakes gatekeeper that separates those who can perform at the minimally successful level from those who cannot. Doctors must earn an MD before they are allowed to practice. Lawyers must complete a law degree and pass the bar exam before they can write a brief or enter a courtroom. In a perfect world, certifications in the technology industry would serve the same purpose. If someone holds an MCSE designation, he or she should be able to manage a Microsoft Windows network with 200 to 26,000 users.¹

The second purpose of certification is to show the relative skills of different applicants for a position. Someone with CompTIA's Network+ designation should have basic networking knowledge, but may not know how to run a large Microsoft network without help. A human resources person should be able to look at the resumes of applicants for a job and know what the skill level and abilities of each individual are based largely on their certifications, just as someone hiring a lawyer could look at the school they graduated from and their class rank. Furthermore, training managers can look at the certifications someone holds to decide what education that person requires in order to move into a new job or do their current job better.

A third purpose is to validate the success of training programs. Certifications can serve as capstones to a battery of training in which all the participants may not have used the same methods. Today's mixture of instructor-led training, online-courses, and self-study make it difficult to measure when someone is qualified to do a complex job.

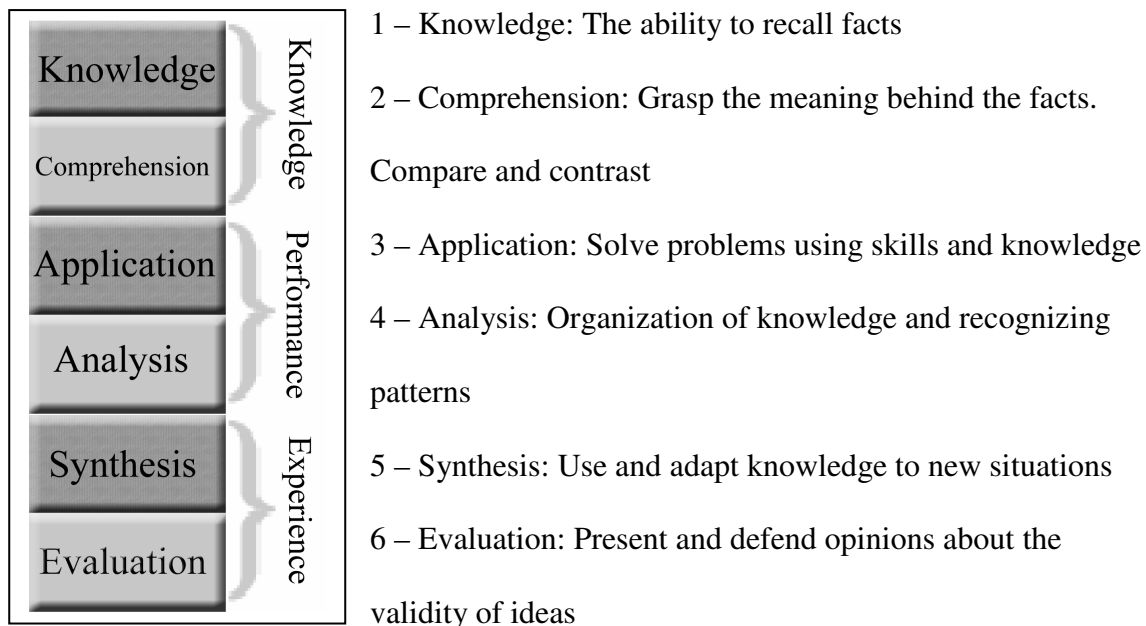
¹ According to the MCSE certification site. <http://www.microsoft.com/traincert/mcp/mcse>.

Certification should allow organizations to measure when their training succeeds and fails to teach practical skills.

Most certifications do an imperfect job of serving these functions. They suggest what jobs a person can do and what their skill level is, but hiring managers usually resort to having one of their on-staff experts talk to job candidates to judge their actual competence. The basic structure of most certification exams makes it difficult to arrive at hiring and promotion decisions based on the credential alone. We can see why with a brief look at educational theory.

Bloom's Taxonomy

In 1956, Benjamin Bloom codified levels of cognitive learning in educational settings into six categories.²



² Bloom, B.S. (Ed.) (1956) Taxonomy of educational objectives: The classification of educational goals: Handbook I, cognitive domain. New York, Toronto: Longmans, Green.

This system shows cognitive levels from simple memory and recall to higher functions of comparison, analysis, and synthesis. Clearly, higher levels on this scale equate to greater competence and expertise. Knowing what a clutch does is very different from successfully shifting gears in rush-hour traffic.

For testing, levels one and two correspond to knowledge of facts. These concentrate on recall and comparison of information. Levels three and four are performance indicators because they go beyond simple recall to the application of knowledge to actual situations and using information in new ways. The final two levels are experience based because they rely on extensive use of the knowledge in creative ways and evaluation of methods and ideas.

The Truth about Certification Tests

The vast majority of certification exams today are solely knowledge-based. They rely exclusively on the recall of specific information, usually through the use of multiple-choice tests. Knowledge is certainly important to technology professionals. In order to successfully maintain a Microsoft network, a technician should know a great deal about the differences between Microsoft operating systems as well as having good basic understanding of TCP/IP and other network protocols. Someone in charge of routers should be aware of the configuration options and be able to read and interpret a routing table. The existing certification exams do a good job of testing this information. Knowledge is crucial to doing technical jobs, but it is not sufficient.

Performance-based tests rely on scenarios that replicate real-world situations. They require the test-taker to operate the relevant system in a practical way. The lab

exam on the CCIE requires the certificant to configure and troubleshoot a live system under expert supervision. In this situation, as in the working world, the steps someone takes to get to the right answer are less important than the final product.

Microsoft and Cisco have realized that many of their tests were too focused on the recall of facts, and they have taken significant steps to improve them. Simulations and active screen items allow the test to show a real screen or specific problem and have the test-taker solve it. These elements can give the test-taker the feeling of being in a live situation. Though an excellent step in the right direction, simulations tend to be narrowly focused and make up only a small proportion of questions on any given exam. They also punish people who do not use standard methods to arrive at correct answers. On one Microsoft example, the applicant must create a subfolder of an existing folder. The simulation does not allow one to create the folder in the root directory and move it, however. The major vendors must embrace performance-based scenarios and make them a large part of every exam at least equal to knowledge-based components.

The Missing Element: Performance

Performance-based tests are common in our everyday world. Traditionally, jobs that include public safety or potential harm to the user or others require a hands-on exam. Earning a license to operate a car not only requires a multiple-choice exam, but also a driving test to prove that the driver can apply the rules of the road in real world conditions. We would all be nervous putting ourselves in the care of an airline pilot if he or she did not have to undergo flight-testing under actual conditions rather than just taking a written test. Technology engineering does not usually involve life and death

risks, but companies now put significant resources and business practices on their network. The people who run these networks operate a piece of a business' critical infrastructure.

Performance-based assessments, because of their very nature, correlate better to work experience than knowledge-based exams. They make it much harder to pass the test without some experience on the system involved. This allows even managers without detailed knowledge of the technology to make a better determination of who is qualified to do a given job.

Another advantage of performance-based certification is the ability to pass the "face value" test. If you want to certify that someone is able to swim, they are going to have to get in the pool and prove it. What good is *knowing* all the strokes if you can't actually *do* them? Right now, people judging the value of knowledge-based certification must take into account that the person certified may not be able to actually do the job. When the certification test looks like the actions someone must perform in the workplace, managers needing to make decisions based on those tests can enjoy more confidence in the credential.

What is the Next Step?

The technology industry must embrace performance-based testing as one of its primary means of assessing skills. Making certification exams look more like the work the applicant will be doing will increase the value of certification to all levels of technology organizations. It disarms critics by creating a far stronger correlation between the certification exam and actual job functions.

Training managers should use hands-on lab-based teaching and testing to assure that graduates of their training programs know more useful skills. Using these tools both before and after training allows very detailed knowledge of what students learn in a given training course. This makes it easier for learning managers to justify their budgets in an era of shrinking outlays for training.

Hiring managers should insist on performance-based measures alongside existing knowledge-based tests. They can then rely on these tests to help them pare down their applicants for a particular job to a manageable number so they can conduct interviews. Furthermore, performance measures will reduce incidents of hiring someone who turns out to lack the skills for their job. These false-positives cost organizations significant money in hiring and training costs to restart the hiring process or train the new hire to do their job.

Both major vendors and several independent organizations now recognize the value of performance-based testing and are increasingly using performance components alongside or instead of traditional knowledge-based elements. These efforts will aid information technology managers and businesses to more consistently identify qualified individuals.