

Lunch-n-Learn

1:00pm-1:45 pm

Should the root prompt
require a road test?

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Is there a mysterious
“compound W”, that:

- Makes system administrators functional?
- Assures job success?



W or M?

- We think of certifications as being a *path into* the profession.
- In fact, we have things upside down.
- Certifications mean more if one has experience, less if not!

What “drove” me to talk to you...

- Experience testing system administration students.
- Current training and certification practices, goals, and beliefs.
- Human factors results on effects of training and experience.
- Profound mismatch between “what we do” and “what we want”.
- The certification “religion”.

Two beliefs of the “religion”

- Certification is something you “believe in” or “don’t believe in.”
 - If you hold certification X, but not Y, then you “believe in certification”, which means you don’t know Y, or you would hold that certification as well...!
- There is a way to measure whether someone will be functional on the job via a written test.
 - There is a way to do better than those “brand X” certifications that don’t accomplish this happy result.

From “Brand X” to “Quality X”

- There is a common belief that certifications *can be done better* than “*Brand X*” (X=whatever certification you don’t like)
- Instead, I take the stance that certifications *can’t measure* “Quality X” (X=some qualities you want in an employee).
- Human factors research helps us understand the nature of “Quality X”.

My opinion

- Simply put, *we try to do the impossible.*
- Goal of certification: if you're certified, you're a *functional system administrator* and *I should hire you.*
- The evidence: *impossible to assure* via any form of written test. Even “hands-on” tests lack important elements.

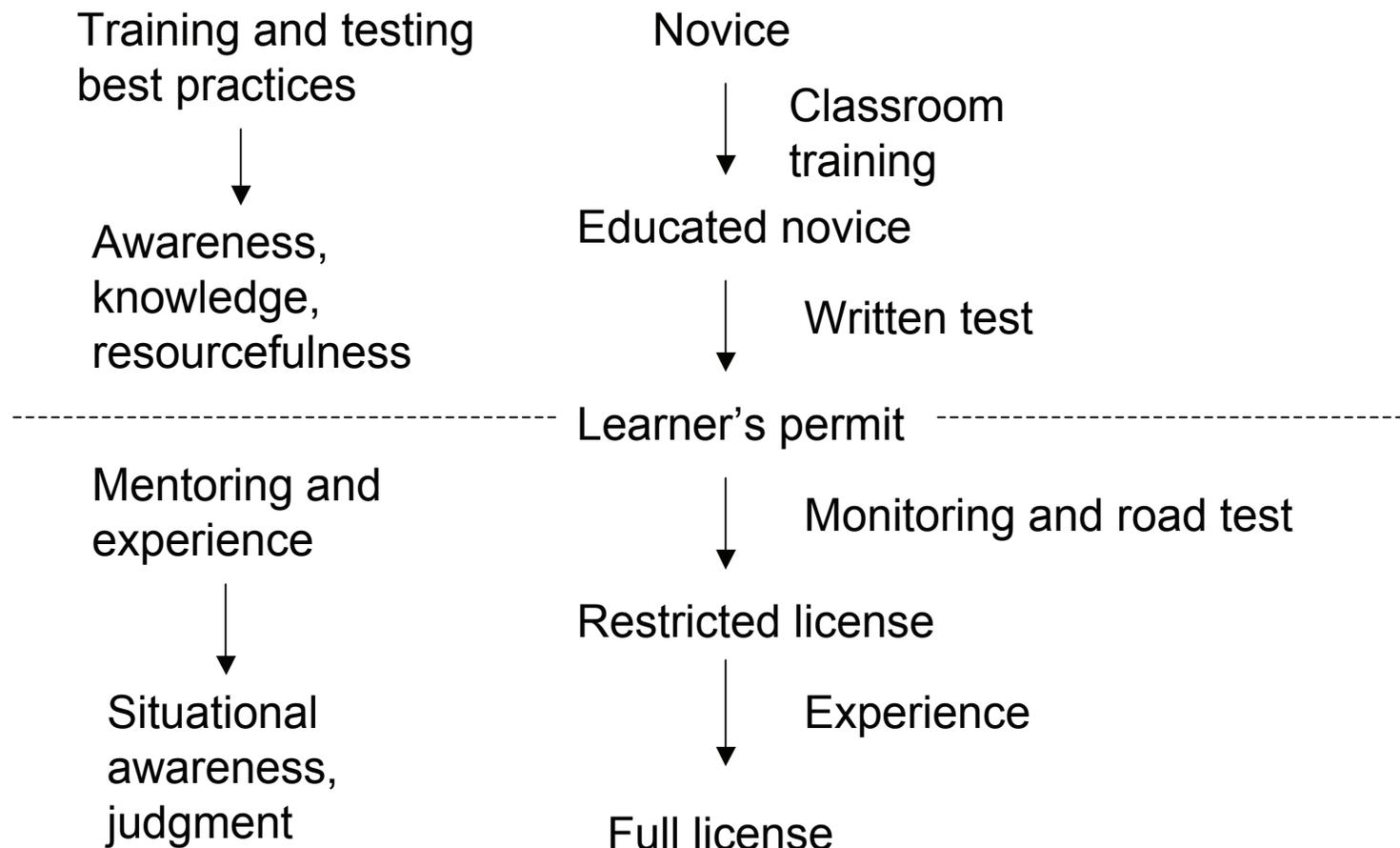
Driving a metaphor

- A similar problem: certifying a driver.
- Written test: similar to certification exam.
- Road test: no analogue.
- Is a road test desirable?
- What would it measure?

Perhaps the wrong question...

- True challenge for driver testing: *high accident rate for new drivers.*
- Similar challenge for certification: *ineffectiveness of certified system administrators.*

Driver Education “Logic”



Why do accident rates go down with experience?

- *Situational awareness*: the ability to sum up a situation and know the options.
- *Judgment*: the ability to make the proper choice from among several options.
- Very well understood for situations such as driving and pilot training.

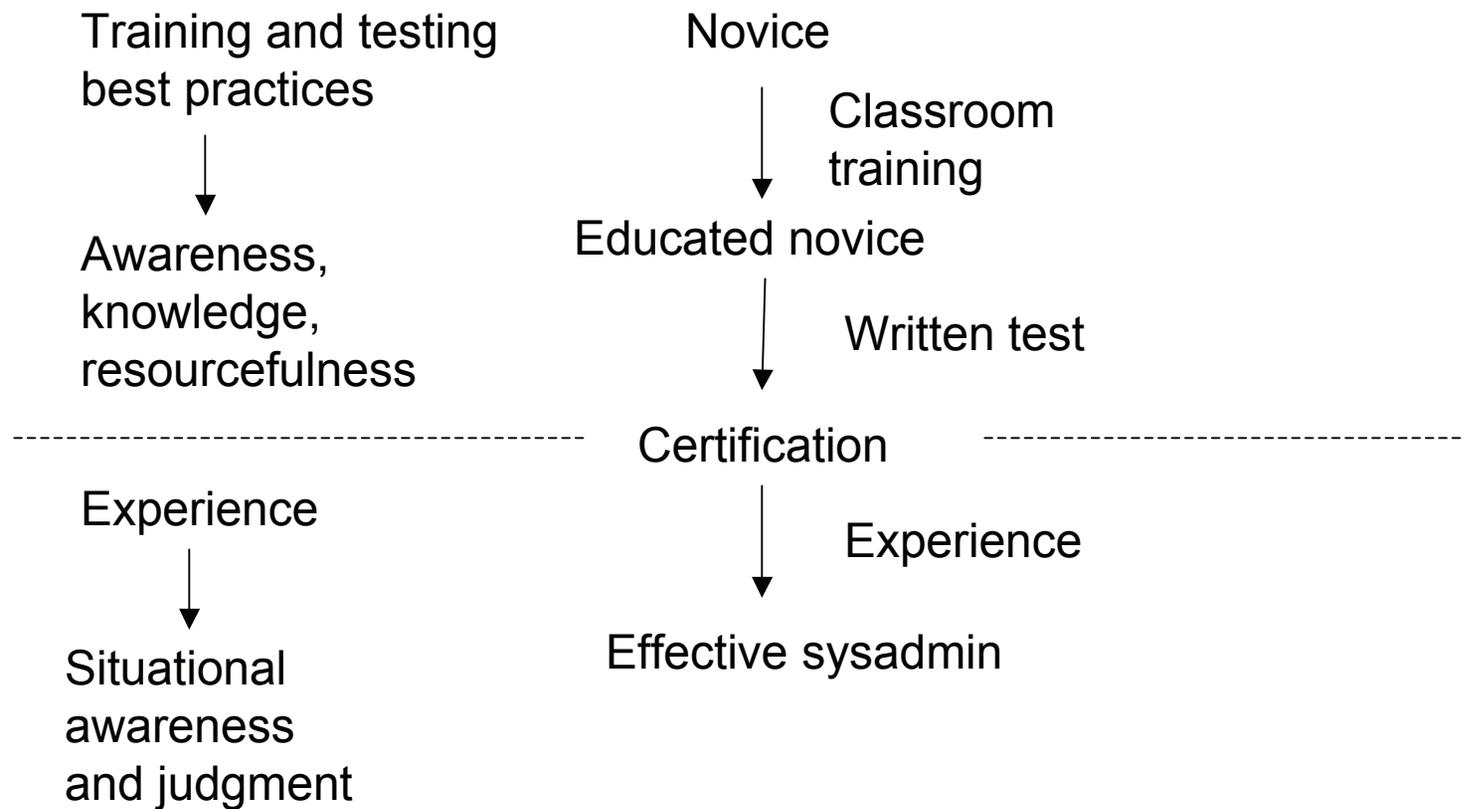
Some relevant results

- Australia: “home schooling” leads to *lower accident rates for beginning drivers* than “classroom instruction.”
 - Message: *personal mentoring* develops “quality X” better than classroom instruction.
- United States: “*graduated licensing*” reduces accident rates.
 - Message: experience is important.

Human Factors Results

- System administrators are “like drivers navigating via a map.”
- Experienced humans navigate better *if not “helped”* by software cues.
- Lin, Brown, and Hellerstein, “Towards an Understanding of Decision Complexity in IT Configuration”, CHIMIT 2007.

Certification “Logic”



If sysadmins were drivers,

- When novices pass “the written exam”, they are put at the wheel.
- One learns by *causing accidents*.

Quality X

- Good system administrators exhibit **situational awareness** and **judgment** (like drivers and pilots).
- Experience and mentoring are best teachers.
- “A wise driver chooses speed based upon conditions; an unwise driver is unsafe at any speed.”

Situational awareness

- What could possibly be wrong?
- What changes affect what behaviors?
- What are the side-effects of making a change?
- How do remedies now affect potential problems later?

Kinds of situational awareness

- Local: on one host.
- Enterprise: on a network of hosts.
- Lifecycle: over time.

Measuring “Quality X”

- Experience metrics: “how much driving have you done?”
- Road test: carefully observe problem-solving behavior.

An irony:

- *Relatively easy* to test “skills”.
- *Difficult or impossible* to test “Quality X” of situational awareness and judgement.

Conclusions

- Certifying the functional capabilities of a system administrator via any form of written test is *impossible*.
- Certification “means the proper thing” for system administrators who already exhibit “Quality X” of good situational awareness and judgment.
- But we use certification the opposite way, to *choose among candidates with little experience!*

Ramifications

- No certification based upon knowledge is going to do any better than “brand X” in assuring job function.
 - *Just give up on this one!*
- Mentoring and experience are very important to creating the intangible qualities that knowledge tests can't measure.
 - *Spend the effort on this one!*

Looking forward

- Certification agencies: don't apologize for not achieving the impossible.
- Employers: consider the true weight of certification and experience in assessing potential employees.
- System administrators: seek ways of gaining experience and awareness rather than just credentials.

Drivers of the technological revolution

- We are drivers ... of technology, progress, and success
- We want “professional” status and “respect”.
- Part of that is understanding just how difficult the job can be.
- It is good that some qualities are untestable and that there is still some “guild knowledge.”

Please

- When driving the technological revolution, please drive safely!

Questions for you

- What true weight should certification have in judging employee fitness?
- How do you measure experience?
- How do employers handle “the road test?”
- How can we create a more meaningful professional certification?