Computer Testing Task Force Final Report: Findings and Recommendations

Executive Summary

Offering electronic testing for the EAC certification exams appears to create almost as many issues as it solves. The Computer Testing Task Force has made recommendations to resolve most of these issues, but left a few unsolved, spelling out the reasons.

The Computer Testing Task Force recommends computerized (aka electronic) testing, but not online testing. While online testing services exist, none offer fully configured Word-based editing tools within web pages. This fact, combined with security challenges, makes Internet testing risky.

One alternative is to hire a national testing company to administer the tests on hardened computers in its own labs. Another is to administer the tests ourselves on hardened computers in labs rented from universities and other organizations. In either event, appropriate software can be deployed for the tests, and the results can be stored either centrally at each site or centrally for all sites.

Using labs allows appropriate invigilation. Related challenges include higher test venue fees, the possibility of losing data during tests, and management of markers and marking.

Offering electronic tests creates another challenge. While proper promotion of the versions of Word supported by the tests will allow candidates to become familiar with them before the exams, the onus will be on candidates to learn the required versions, much as they now need to learn and practise hand mark-up before testing. Further, if the Track Changes function of Word is used, we may need to develop a standard for its use, to avoid increasing marker time and difficulty with evaluating results.

There's a strong risk of computer failure when delivering electronic exams. One remedy may be to allow an afflicted candidate to write a different version of the test a few days later. This risk is comparable to the current situation, wherein completed test papers are couriered to the national office from the test sites. If the package is lost, the test needs to be readministered (for which no contingency currently exists). A test question bank would be useful in resolving this situation.

Other considerations are the effects of electronic tests on markers and on how marking is done, the changes needed to national office and Certification Steering Committee procedures, on-site technical support requirements, and the big two—ongoing challenges with Track Changes, and whether it's possible to permanently and irretrievably remove an exam from all computers and servers after a test administration.

This report includes the research we've done and a list of decisions required before further work can proceed.

While the results are not what we expected when we started, we've enjoyed working through the challenges we've encountered.

~Anne Brennan, Carolyn L. Burke, Sandy Gough, David Johansen, and Juliann Krushen
2011 Computer Testing Task Force

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What is Computer Testing?

Computer testing means candidates write exams on computers. So does *electronic testing.*

Online testing means candidates write exams via the Internet.

The Computer Testing Task Force recommends that EAC offer computer testing, not online testing, and that we provide the computers, rather than allowing candidates to use their own.

Secure Computer Labs

For security and consistency, we recommend using secure computer labs containing both PC and Mac desktops that have been set up ahead of time with recent versions of Word, no access to the Internet, and no access to CD drives or USB ports. Securing a computer in this way is referred to as *hardening* it.

Candidates should not be permitted to use their own computers, which we cannot harden. They should, however, be permitted to provide their own split keyboards and/or ergonomic mouse devices, if they need them. Whether this is possible depends on whether the test centres allow us to install the software to run these peripherals.

Candidates should be able to request their preferred platforms (PC or Mac) when they register. EAC should select test centres that have the correct number of each platform ready at each test site.

Carolyn has provided a list of institutions across the country that have computer labs. In Vancouver, EAC already offers the certification exams in a building that contains secure computer labs. In some cities, we may need to administer the computerized exams in sites we haven't used before.

Software

Since Word is the software almost universally used for editing, we recommend that it be used for the certification exams.

The exams should be administered in the most recent version of Word for Windows and the most recent version of Word for Mac.

The promotional certification documentation should specify which versions the candidates are expected to use. It should also emphasize the need to become familiar with Word's Track Changes and Comments tools.

To Track or Not to Track?

We wondered whether it was necessary for test takers' changes to be tracked. We therefore spoke with someone who had marked several EAC certification exams.

She strongly recommended that markers see tracked changes. Seeing full pages with all of the mark-up in place is helpful.

Markers need to be able to follow the candidates' logic, especially if their answers are borderline. It's important to be able to see the levels at which the candidates have interacted with the original text. If they've overlooked things they should have caught, there must be reasons. Markers can understand the candidates' logic processes only if they can actually see the changes.

Markers are often asked to reread exams. An exam goes back and forth between different people, all allocating marks, and then the marking analyst averages the marks and determines the score. At every stage, the marker must evaluate how the candidate has dealt with particular problems.

Comments are currently required in the margins of every hand-written test. A Comments tool is therefore required for any computerized version.

We wondered whether we could administer the exams in software that doesn't track changes, then use another program to compare each candidate's work with the original document. The Compare Documents function in Word is pretty messy. We therefore recommend the use of Word with Track Changes enabled.

Unresolved Issues with Tracking

There's a problem with Word's Track Changes tool that we haven't resolved: when you move a block of text, you lose the tracking for any changes you've made within that block of text. The moved text looks like an insertion of completely new text.

Although we can't solve this problem, we might be able to mitigate it to some extent by suggesting that candidates move large chunks of text before doing closer edits.

We wonder whether this will be a problem for the markers. Will providing a clean copy and a tracked copy of each candidate's work be enough to show the candidate's thought process?

It's important to keep these issues in mind when developing test questions.

We looked into the possibility of hiring someone to reprogram Word, to keep tracked changes visible when a chunk of text is moved, and whether there are hidden features in the Track Changes tool that we can turn on and off but that candidates can't control. The answer to both questions is no. The only company that can amend Word's programming is Microsoft, and it's not interested in servicing the consumer market at this level.

We need to provide printed copies of both tracked and untracked versions for the markers, so they can easily see what's been done and what problems may remain in the candidates' work. This means we need the capability to hide and display all changes ourselves.

We wondered whether we should have a standard governing how changes should be tracked on exams. For example, should candidates work with their tracked changes hidden, so they're able to catch spacing errors, etc.? Or is this something we should leave to the candidates' discretion? If the latter, is their choice part of the assessment? That is, should we evaluate whether they know how to change Word's settings to variously hide and display their changes? Should we consider these questions when designing the test questions? All *Professional Editorial Standards* says on this issue (clauses C13 and D16) is "When working on electronic copy, use an agreed-upon markup system (e.g., track changes, PDF markup tools)."

We concluded that although markers can't tell which settings candidates have used by looking at printed copies of the tests, candidates may need to switch back and forth between seeing and hiding their changes,

to avoid leaving errors in the text. We want to allow candidates to use their established editing procedures as much as possible during the tests. We may therefore wish to suggest ways to use Word that will lower candidates' stress levels and accommodate their usual editing practices.

Commercial Testing Services

The Computer Testing Task Force looked at a number of options for test administration, including commercial testing services. None of these services currently offer software with tools for tracking changes and attaching comments.

Because the test markers need to see the processes candidates use to arrive at their answers, and because Track Changes and Comments are primary means by which most editors communicate with their authors, we feel that these tools are necessary for the certification exams.

Some of the commercial testing services may be able to build customized tools for us, but the cost is likely to be prohibitive. Carolyn has identified a couple of companies that might be appropriate, if we decide to go this route.

Capturing Candidates' Work

For security and consistency, candidates should be unable to save their work on removable media (such as CDs and thumb drives). They should be able save their work in just one of three ways:

- On the test computers' hard drives.
- On servers that serve the individual test sites.
- On a central server that serves all of the test sites.

The Computer Testing Task Force has not determined which of the three choices is best. Each has advantages and drawbacks.

The option we select may depend on which test centres we choose and what they allow. If a centre allows candidates to save the tests only to the computers' hard drives, for example, invigilators will need to save the tests on USB drives or CDs. And if there's a problem with a server, it can affect all of the candidates at the test site(s) the server is connected to. On the other hand, if there's a problem with a non-networked computer, a single candidate may suffer a disadvantage not shared by the other candidates.

Unresolved Issues with Capturing Candidates' Work

No matter which option we choose for saving the candidates' work, we need to ensure that every copy of the exam is permanently and irretrievably erased from every computer and network server.

A skilled forensic technician can retrieve almost anything once it's been saved to a computer—even if the user has deleted it. We need to find out whether any software is available to prevent this, and if not, we need a strategy to deal with it.

Technical Support and Liability

Technical support will be required at each test site. This means we need to recruit (or hire) technicians as well as invigilators.

Perhaps we can have automatic backup on servers, so candidates don't lose a keystroke. This may depend on which test centres we choose. They may not allow outside technicians to touch their computers or networks, or they may provide support staff (inclusive or for additional fees). Their servers may have backup settings we can't change. Word has settings for backup saves, but frequent automatic saves can disrupt workflow, so we may need to remind candidates to save frequently, at their discretion.

Things can still go wrong. The Computer Testing Task Force therefore recommends that we have candidates sign a waiver of liability that outlines what will happen if there's a technical problem during an exam. The waiver should specify the types of computer and software that are used, and the backup plans in the event of problems.

This information should be included in the exam registration package and in the confidentiality agreement that candidates sign at the test sites.

Canadian professional accounting associations, for example, have waivers stating that if there are computer problems, the affected candidates will continue their exams on paper and cannot rewrite at another time. For an EAC exam, if there's a computer problem, candidates won't be able to print what they've done so far. Even if they could, it would be very difficult to administer, unless there were a printer attached to every test computer.

Marking

The Computer Testing Task Force recommends that markers be asked to work with print copies of all completed exams. This will prevent a marker from inadvertently making any changes to a candidate's work, and will prevent the escape of electronic files.

We need to provide markers with final clean copies as well as marked up copies of the exam papers. Markers will use the final clean copy to ensure that the text flows appropriately, there are no spaces left where there shouldn't be any, and so on.

We suggest creating, piloting, and marking a dummy test, to find out how various tracking options affect the marker's job. Perhaps an experienced marker will volunteer to mark it.

Exam Versions

Computer testing will require a question bank, so we have more than one version of each exam available in the event that a technical problem prevents someone from continuing with the exam once s/he has started writing.

It's important that we be able to keep track of which questions are used on which versions of each exam, which PES items and which edition of PES they're based on, and which questions each candidate has seen before. We therefore need a database of some kind in conjunction with the question bank.

Suggested Work Flow

The following work flow will change as we learn more about test centres and develop marking and administration procedures.

During Promotion and Registration

The promotional materials should:

- Identify the test locations that have PCs and the test locations that have Macs. (Ideally, each location will have enough of both platforms for each candidate to use the one of his or her choice.)
- Identify the version of Word that will be installed on the PCs and the version of Word that will be installed on the Macs at the test sites.

The registration package should:

- Provide an overview of the test mechanics (i.e., the test will be preloaded onto each computer; Track Changes will be turned on; Comments will be used to clarify thought processes underlying decisions; the test cannot be printed or saved by candidates; the computers will have no Internet access; etc.).
- List USB drives, CDs, and DVDs among the materials that are prohibited at the test sites.

The exam will be designed to include a field in which each candidate types his or her ID number. The number will then be automatically added to every page of the file. This will eliminate the need to type the ID number several times (thereby reducing the chance of error).

Exam Site Set-Up

1. The EAC national office will send TWO thumb drives containing the exam to each site supervisor (one for backup, in case the original is corrupted or lost), together with the other required materials.

2. The EAC site supervisors and/or technicians will load the exam file onto each computer that will be used, or upload it to the network and set up access for each candidate.

3. The EAC invigilators and/or technicians will confirm that CD, DVD, and USB ports are disabled.

4. The EAC invigilators and/or technicians will confirm that the computers do not have Internet access.

5. The EAC invigilators and/or technicians will confirm that the candidates have access to the test centre's network, or to the national network (depending on what option is chosen).

6. The candidates will sign a waiver specifying what will happen in the event of computer problems.

7. The EAC invigilators and/or technicians will ensure that candidates can log into the network (if network servers are chosen).

During the Exam

1. The EAC invigilators and/or technicians will answer basic technical questions as they may arise.

2. If technical problems occur that affect one candidate, the EAC invigilators and/or technicians will take appropriate action, as specified in the waiver.

3. If technical problems occur that affect all candidates, the EAC invigilators and/or technicians will take appropriate action, as specified in the waiver.

After the Exam

1. Candidates will save their exams to the network drive(s) or computer desktop(s), as specified by the invigilators.

2. The EAC invigilators and/or technicians will confirm that each test file has been correctly saved.

3. If the candidates have saved their exams to the computer desktops, the EAC invigilators and/or technicians will copy each exam file to EACH of the two thumb drives.

4. If the candidates have saved their exams to a local network server, the EAC invigilators and/or technicians will copy each exam file from the server to EACH of the two thumb drives.

5. If the candidates have saved their exams to the computer desktops, the EAC invigilators and/or technicians will delete the exam files from the desktops and take whatever measures are required to ensure that the exams are permanently and irretrievably gone from the computers.

6. If the candidates have saved their exams to a local network server, the EAC invigilators and/or technicians will delete the exam files from the server and take whatever measures are required to ensure that the exams are permanently and irretrievably gone from the servers.

7. Each site supervisor will courier ONE of the two thumb drives to the national office, together with the other materials that must be returned.

8. The national office will notify each site supervisor when the first thumb drive arrives.

9. Each site supervisor will then courier the second thumb drive to the national office.

10. EAC personnel in the national office will open each file and print each exam twice—once with tracked changes showing and once with tracked changes hidden. They will take care to make NO changes to any exam file.

11. EAC will courier both copies of the printed exams to the markers.

12. EAC will save the thumb drives containing the completed exams in a locked file cabinet in the national office.

Marking the Exam

1. The markers will receive two printed copies of each candidate's exam—one with the changes tracked and one with the changes hidden.

2. The markers and the test analyst will proceed with their usual marking and evaluation procedures. The only difference from the procedure for hand-written exams will be that the markers can now refer to both tracked and clean copies of the candidates' work.

Decisions Required

1. Should we continue to look for a commercial testing service, or should we rent computer labs with computers set up to our specifications, and administer the exams ourselves?

2. Should candidates' work be saved on individual test computers, on servers that serve individual test sites, or on a server that serves all of the test sites?

3. Should we have a standard for how editors use the Track Changes tool? Should this be part of the assessment? Alternatively, should we give suggestions for how a candidate can use Track Changes to best effect during a test?

4. Should we offer all four tests via computer? Proofreading could (and perhaps should) still be offered on paper. If it is, we should specify which collection of hand mark-up symbols candidates are expected to use.

Action Required

1. Clarify and/or revise the competencies candidates are expected to demonstrate, so they include editing, tracking changes, and addressing comments to authors via computer.

2. Decide which exam to use for the pilot. It should probably be a copy editing test, because proofreading still lends itself to paper for many editors, and substantive and stylistic editing may be better left until the bugs have been worked out of the process.

3. Consult an IT expert to decide whether to save completed exams on computer hard drives, individual test site servers, or a central server for all test sites. This information will help us evaluate the services offered by potential test centres.

4. Consult an IT expert to find out how (and whether it's possible) to permanently and irretrievably remove exams from individual computers and network servers after an exam administration.

5. Design a pilot exam for electronic delivery, ensuring that the instructions include information about how candidates are to use Track Changes and Comments.

6. Update the instructions for markers, to include information pertinent to electronic testing.

7. Deliver and mark the pilot test. This will allow us to answer questions about the ease of writing an exam on computer, the ease of marking a computer-written exam, and the exam work flow and marking procedures. It may also alert us to issues we haven't thought of.

8. Research the capabilities of potential test centres. Their limitations and resources may affect what we can offer.