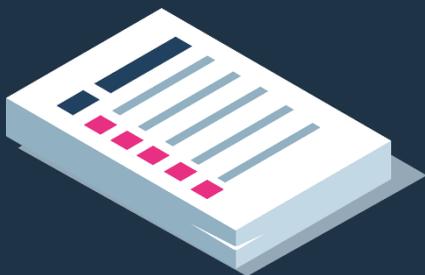


Five practical approaches to test beyond recall

*Testing employees on more than recalling
knowledge to help improve job performance*



Introduction: why is testing beyond recall important?

Employers use tests in the workplace to check employee competence, recruit and confirm employee readiness after onboarding. They also use tests to check training has worked and for certification, promotion and compliance.

In most cases, tests assess whether someone has the skills they need for a job. So, getting it right matters for the business's performance and often to safely meet compliance requirements.

When developing assessments to test specific skills, some employers may fall into a trap where their questions only focus on recall of knowledge. In other words, they are only testing if the employee knows their facts.

If employers want their people to win the "Who wants to be a millionaire" game show, the ability to recall facts is important. But, in most jobs, although some knowledge is needed, it's often more important to be able to synthesize, understand, apply and evaluate information, rather than just know things.

When most employees can search for information on the internet, it's what they do with that information that counts.

It's common for employers to use tests that ask about knowledge after training or in other workplace situations partly because such questions are easy to write.

But questions that only ask for recall of knowledge have a limited capability to fully measure job skills. So, there is a risk that workplace tests that only focus on recall will not be valid and will prevent employers making fully informed people-related decisions.

This white paper explains that, while there is some value in testing staff knowledge, it is usually much more important to test an employee's understanding or application of knowledge. These cognitive skills are commonly referred to as being "above knowledge". The paper then goes on to explain five practical ways employers can test "above knowledge".

To understand how Questionmark can help, please book a demo:

<https://www.questionmark.com/request-demo/>



Assessing cognitive skills and job performance

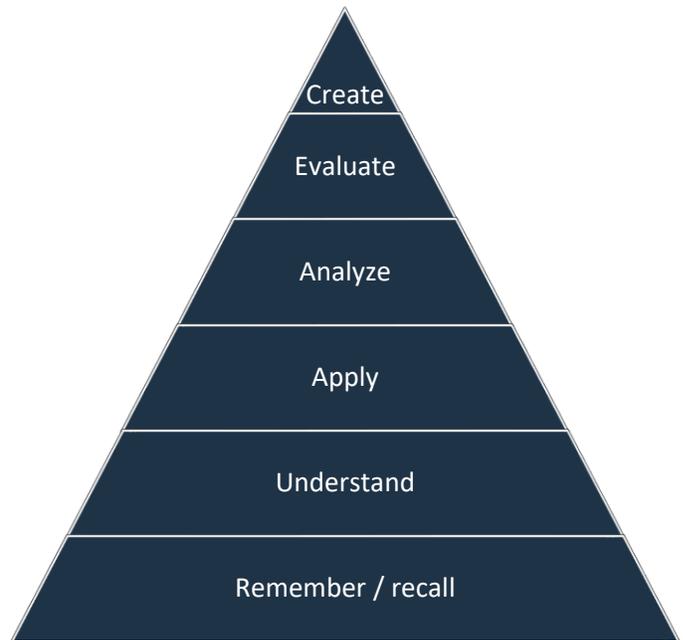
A widely accepted way of ordering cognitive skills is the Blooms taxonomy, shown in the diagram below.¹

Skills are ranked on a hierarchical framework in order of complexity.

Remember/recall, where employees or learners can recall facts and basic concepts, is the lowest level of cognitive skill.

The highest level of cognitive skill is to “create”, where employees or learners can use the information to create something new.

Most jobs require many levels of cognitive skill. So, if employers using questions that only test for recall, they risk using assessments that do not properly assess someone’s ability for a job.



That means that any certification or decision made because of the test will be, at best, partially valid. At worst, it may be entirely invalid. Depending on what the test measures, it could mean some employees are in jobs in which they do not have the necessary skills.

To quote Southern Illinois University testing experts William Coscarelli and Sharon Shrock²:
“In general, the single most useful improvement you can make in writing test items is to write them above the memorization level.

... the vast majority of test items are written at the memorization level. In contrast, the vast majority of jobs require performance that is above the memorization level. This disconnect between testing practice and job performance is what often leads management to question the value of training and turns testing into a misleading indicator of performance, e.g., “How come they passed the course but can’t do the job?”

¹ This is the revised Blooms taxonomy. See <https://cft.vanderbilt.edu/guides-sub-pages/blooms-taxonomy/> for a longer description.

² See https://shrockandcoscarelli.com/wp-content/uploads/2010/10/two_most_important_things1.pdf

As Coscarelli and Shrock point out, the most important thing for employers to do is to test beyond recall. The specific level at which employers test above recall is less important, as long as they are testing their people on more than their ability to memorize facts and basic concepts.

There is some value in testing knowledge. It is often a necessary skill. What's more, there is evidence that asking questions prompts retrieval practice that helps employees retain learning for longer.

But, to ensure a valid, reliable and defensible assessment that accurately reflects job performance, most questions should test above knowledge.



Five approaches to testing above knowledge

There are many ways of testing above knowledge or beyond recall. Here, we explain five practical methods employers can use in the workplace.

1. *Test above knowledge with multiple choice questions (MCQs)*

MCQs can be used to ask for facts. They can also be used to ask for higher-level cognitive skills. When drafting such questions, employers should include the scenario or context in the question to put participants closer to the work environment.

For instance, here is a simple recall question:

What does a yellow traffic light mean?

- (a) Stop
- (b) Go
- (c) Caution
- (d) Look behind

Here is a re-working of the question asking the test-taker what to do in a relevant situation. The focus of the question is now on understanding rather than just recall.

If you are driving toward an intersection and the light turns from yellow to red, what should you do?

- (a) Speed up and cross the intersection
- (b) Continue at the same speed and cross the intersection
- (c) Stop suddenly
- (d) Stop gradually

Employers should adopt similar techniques to write questions beyond recall.

2. *Using multiple answer question types*

Questions that test beyond recall often involve the participant applying a principle or putting together different pieces of information to form an answer. Using a question with multiple answers, whether matching, matrix or another type, can often be a good way of doing this.

For instance:

Classify each statement as realistic or absurd:

An aquatic mammal	<input type="radio"/> Realistic	<input type="radio"/> Absurd
A fish with a lung	<input type="radio"/> Realistic	<input type="radio"/> Absurd
A single-celled metazoa	<input type="radio"/> Realistic	<input type="radio"/> Absurd
A flatworm with a skeleton	<input type="radio"/> Realistic	<input type="radio"/> Absurd
A coelenterate with a mesoderm	<input type="radio"/> Realistic	<input type="radio"/> Absurd

In this example, the test-taker has to apply their knowledge to identify whether a series of possibilities are plausible. Alongside testing above knowledge, such questions are also harder to guess than simple MCQs.

3. *Situational Judgment*

Almost all job roles require judgment. Situational Judgment Assessments (SJAs) are a way of asking questions that measure judgment. They present a work-relevant dilemma to test-takers where the answer needs professional judgment on what should be done. These questions often work like this:



Here is an example SJA question:

You are responsible for the security of your company's payment processing application. You recently received an email from a person who claims to have hacked into the system and discovered that you are running an out-of-date and vulnerable operating system on one of your servers.

You have checked and the hacker is correct. Your preliminary check has shown no trace of how or whether the hacker got into your system. Those checks suggest that there isn't anything unusual with the system's performance.

From the options below, identify the actions that would be most and least appropriate in dealing with this situation.

- (a) Be grateful this is a white-hat hacker who has done the company a favor by identifying the vulnerable operating system. Your main action should be to fix the operating system as soon as possible and ensure that operating system reviews and updates are done more quickly
- (b) Drop your other work and run a thorough system scan and log review to identify if anything else is awry with the system. If nothing is found, update the operating system and continue normally
- (c) Shut down the system and call-in security consultants to do a thorough review of what intrusion there has been and whether there has been any data breach, financial loss, or other serious impacts, and then update the operating system
- (d) Fix the operating system and then report the security breach and the hacker's email to the police so that any potential criminal activity can be acted on by the relevant authorities

For more information on SJAs, our white paper is here:

<https://www.questionmark.com/download-assessing-for-situational-judgement/>.³

4. Performance-based testing for IT tasks

Performance-based testing allows the measurement of practical IT skills, such as the use of Windows, Linux, AWS, Azure, or other software applications. Once a live virtual machine "lab" is configured, the test-taker performs the practical task using any approach they choose and are graded on how they perform.

³ For more on Situational Judgment Assessments, see the Questionmark white paper available at <https://www.questionmark.com/download-assessing-for-situational-judgement/>.

Such questions validate skills by requiring the test-taker to do a task, measuring genuine performance. They are also nearly impossible to guess.

Here is an example question⁴:

The image shows a screenshot of the 'Challenge Labs: Guided' interface, divided into two main sections: 'Guided Challenge Lab Title Page' and 'Guided Challenge Lab Instruction Page'.

Guided Challenge Lab Title Page:

- Features the 'Challenge Labs' logo with a green bar chart and the word 'Guided' below it.
- Contains the text: 'Create a Library To Analyze Text by Using Azure Cognitive Services'.
- Includes a blue button labeled 'Challenge Overview'.

Guided Challenge Lab Instruction Page:

- Section: 'Configure the Azure Text Analytics Service'.
- Instructions:
 - Sign in to the Azure portal at `https://portal.azure.com` as `User1-16687233@cloudslice.onmicrosoft.com` using `NGq57*p$kH` as the password.
 - Create an Azure Text Analytics service named `AAI-001-16687233` in the `TextAnalyticsGuided100lod16687233` resource group by using the **Standard S0** pricing tier.
- Hint: 'Expand this hint for guidance on creating the Text Analytics service.'
- Step: 'Wait for the service deployment to complete. This will take approximately one minute.'
- Section: 'Check your work'.
- Task: 'Confirm that you created an instance of the Text Analytics service named `AAI-001-16687233`.'

⁴ Courtesy Learn On Demand Systems: <https://www.learnondemandsystems.com/>

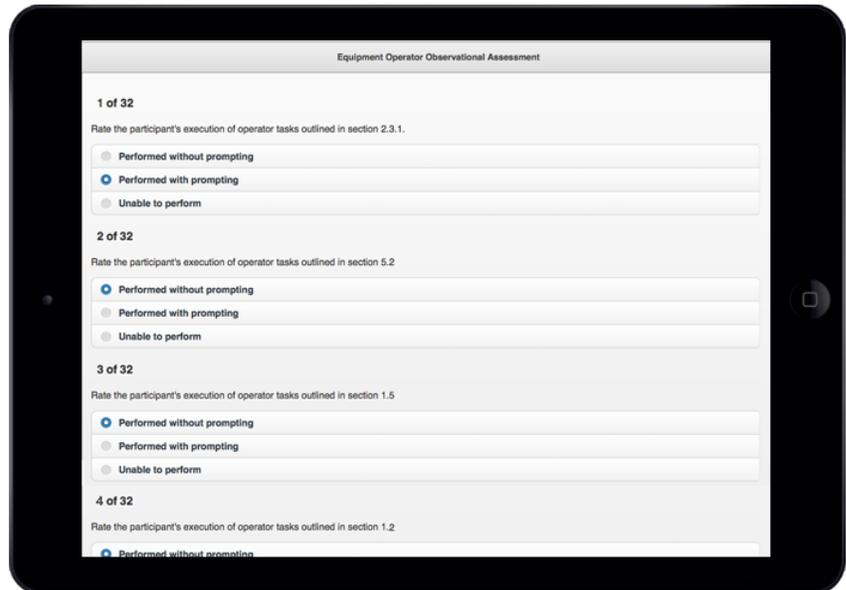
5. Observational Assessments

Finally, employers should consider observational assessments.

An observational assessment is where an instructor or supervisor observes someone doing a practical task and rates them on it, using a checklist, often using a mobile device.

Observational assessments are commonly used in measuring equipment operation, sales training and medical practitioner skills.

The observer logs in, identifies the person being observed and then rates them as they complete a practical task. Often observational assessments involve preparation questions, the process of completing the task itself, and then finishing up questions. For observational assessments to work well, there must be consistent rating scales that all instructors understand, use and which are closely monitored.



Equipment Operator Observational Assessment

1 of 32
Rate the participant's execution of operator tasks outlined in section 2.3.1.

Performed without prompting
 Performed with prompting
 Unable to perform

2 of 32
Rate the participant's execution of operator tasks outlined in section 5.2

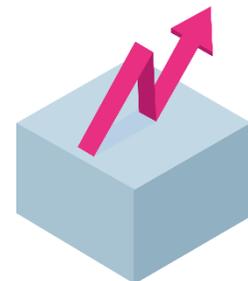
Performed without prompting
 Performed with prompting
 Unable to perform

3 of 32
Rate the participant's execution of operator tasks outlined in section 1.5

Performed without prompting
 Performed with prompting
 Unable to perform

4 of 32
Rate the participant's execution of operator tasks outlined in section 1.2

Performed without prompting



Conclusion: practical steps to test better

For employers testing their workforce, they will get better results if they test more than their people's ability to recall information.

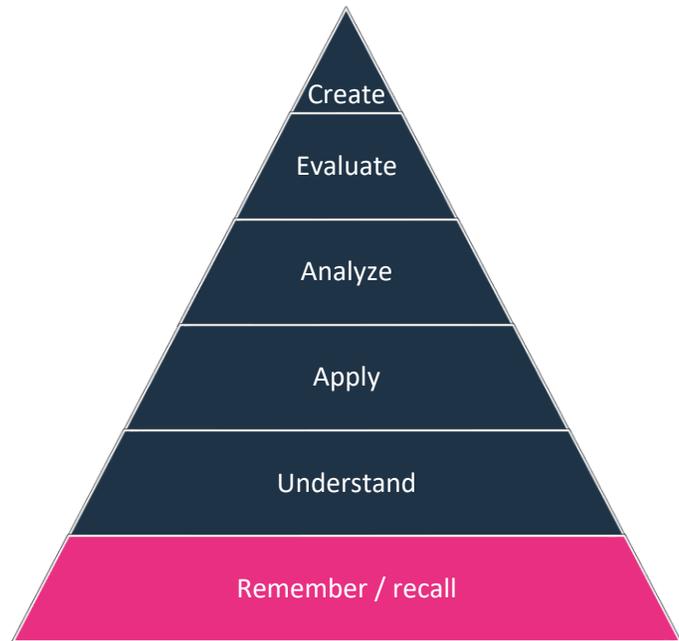
To assess an employee's skills and suitability for a specific job role, employers must test their understanding or application of information, not just their memory of it.

There are many ways to do this. In this white paper, we have explained five practical methods that employers can use.

These include writing MCQs, using other question types, employing Situational Judgment Assessments, using Performance-based Testing, and making use of Observational Assessments.

All of these methods will ensure that employers test beyond recall. Employers can be sure that they are using robust tests that are accurately testing an employee's true ability and skills.

In doing so, employers will unlock the potential of their people and their business, helping improve business performance.



question mark

About Questionmark:

We help employers and their people unlock their potential to deliver better performance.

Questionmark provides a secure enterprise-grade assessment platform and professional services to leading organizations around the world, delivered with care and unequalled expertise. Its full-service online assessment tool and professional services help customers to improve their performance and meet their compliance requirements. Questionmark enables organizations to unlock their potential by delivering assessments which are valid, reliable and fair, which can be defended.

Questionmark offers secure powerful integration with learning management systems (LMS), learning record stores (LRS) and proctoring services making it easy to bring everything together in one place. Questionmark's cloud-based assessment management platform offers rapid deployment, scalability for high-volume test delivery, 24/7 support, and the peace-of-mind of secure, audited U.S., Australian and European-based data centers.

Working with Questionmark

To further explore how Questionmark could work for your organization, or to book a free consultation and demo, please see: <https://www.questionmark.com/request-demo/>

United States

333 W 39th Street
Suite 1003
New York, NY 10018
Tel: (800) 863-3950
Fax: (800) 339-3944

United Kingdom

New Kings Beam House
22 Upper Ground
South Bank
London, SE1 9PD
Tel: +44 (0)20 7263 7575
Fax: +44 (0)20 7263

Germany

Hopfenstr. 8,
80335 Munchen
Tel: + 49 (0) 89 220 61272

Australia

RSM Australia, Level 13
60 Castlereagh Street
Sydney NSW 2000
GPO Box 5138
Sydney NSW 2001
Tel: +61 2 8073 0527

Legal note

This document is copyright © Questionmark Corporation (Questionmark) 2021.

Although Questionmark has used all reasonable care in writing this document, Questionmark makes no representations about the suitability of the information contained in this and related documents for any purpose. The document may include technical inaccuracies or typographical errors, and changes may be periodically made to the document or to the software referenced. This document is provided "as is" without warranty of any kind. See your support contract for further information.

Company and product names are trademarks of their respective owners. Mention of these companies in this document does not imply any warranty by these companies or approval by them of this guide or its recommendations.

