

# Improving and Developing Critical Thinking

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October 2019



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## Critical Thinking in Today's World

Critical Thinking (CT) is a term that is appearing increasingly in both academic and occupational contexts. Putting “critical thinking” into a popular online search engine yields 65 million results. Numerous research studies show that while CT is an important ability, it is lacking in many students and employees.

Good decisions require focusing on the most relevant information, asking the right questions, and separating reliable facts from false assumptions in order to come up with a logical decision. These are intrinsic elements of CT and without each of these elements, a decision is likely to fall short, leaving both the individual and organisation open to criticism.

Whilst sound decision-making has always been important, an explosion in the volume and speed at which we receive news has led to us facing a complex flow of information both at home and at work. Objectively evaluating this information is becoming increasingly difficult.

Whilst we are receiving much more information than we did in the past, we need to start using our brains more to filter and critically evaluate the massive amounts of data that reach us every day.



**Critical thinking ability is now more important than ever and its requirement is most certainly not limited to the workplace – it also has distinct societal relevance.**

## The Growing Importance of Critical Thinking

CT goes back more than 2,500 years to the time of Socrates, who used a method of probing questioning to ascertain how rationally people could justify their claims and opinions.

The term 'critical thinking' appeared in the early 20th century to describe an educational goal and is believed to have originated from the American philosopher, John Dewey.<sup>1</sup> He more commonly called it 'reflective thinking', which he defined as active, persistent and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it, and the further conclusions to which it tends.

Critical thinking gained yet more recognition in the early 21st century when it was termed one of the 21st century skills. This is evidenced by the fact that CT as a requirement in job postings in the USA have more than doubled between 2009 and 2014.

According to the O\*NET database, and in researching a number of job descriptions; hundreds of job roles now require CT skills.<sup>2</sup>

Many organisations now expect staff to be competent in four core (often termed 21st Century) skills or Four Cs:

1. Critical thinking,
2. Communication
3. Collaboration
4. Creativity.<sup>3</sup>

In the workplace, CT is seen as the raw material that underpins a number of core skills and competencies, as shown in the diagram below.



The results of a number of wide-ranging employability surveys, conducted by various organisations (including the American Management Association and the World Economic Forum) into the competencies and skills required now and in the future, show that CT is becoming increasingly important.<sup>4,5</sup> Details of these survey findings can be found in the paper: [The Importance of Critical Thinking and How to Measure it.](#)<sup>6</sup>

## Improving and Developing Critical Thinking

Despite this need for increased CT skills in numerous job roles, many employers are finding that students are leaving schools and colleges with poor CT skills.

In a Times Educational Supplement 2014 international survey, teachers were asked to rank the skills needed for success in higher education; 92 percent identified CT as one of the most important.<sup>7</sup> Yet despite this, when asked which skills students currently lacked when they entered university after school, 56 percent of the teachers said they were still unable to think critically.

### Critical Thinking Definition

Interestingly, whilst both employers and academics cite the increasing importance of CT, there is some uncertainty about what exactly CT is.

A 2018 article in the Stanford Encyclopedia of Philosophy entitled 'Critical Thinking' states that, "*its definition is contested, but the competing definitions can be understood as differing conceptions of the same basic concept: careful thinking directed to a goal.*"<sup>8</sup>

The article goes on to state "*controversies have arisen over the generalizability of critical thinking across domains, over alleged bias in critical thinking theories and instruction, and over the relationship of critical thinking to other types of thinking.*"

Whilst there are still conflicting views over certain aspects of CT there is a general consensus, that, at its core, CT involves "*questioning assumptions, objectively evaluating information and arguments and making logical and rational decisions.*"

It is not about criticising or finding fault. Other researchers contend that in addition to the above, CT also involves the ability to think creatively.

A well-rounded critical thinker is able to create new ideas and solutions, critically evaluate them

and then make logical and rational decisions. Finally, critical thinkers should be able to reflect on their decisions and evaluate them critically. In the Pearson publication, *7 Skills for the Future: Adaptability, Critical Thinking, Empathy, Integrity, Optimism, Being Proactive, Resilience*, Emma-Sue Prince, defines CT as "*questioning assumptions, evaluating a situation from different angles, solving problems creatively and using a reflective, considered approach (to evaluate and learn from the experience).*"<sup>9</sup>

Other observers, such as Sherry Diestler, add that in addition to the points above, critical thinkers develop and exhibit personal traits, such as fair-mindedness and empathy.<sup>10</sup>

What constitutes fair-mindedness and empathy however, is very open to interpretation.



After evaluation of various literature, at TalentLens we define CT as the ability to look at a situation logically and clearly understand it from multiple perspectives while separating facts from opinions, prejudices, intuition and assumptions.

## Developing Critical Thinking

Many people ask, "if critical thinking is a cognitive skill, how can you develop or change it?"

Both problem solving and CT are cognitive abilities, in that they are governed by how you think and reason. However, CT also taps into behaviour and by changing or modifying this we are able to improve some areas of how we evaluate information and make decisions.

**The most important step for developing CT skills is to become a critic of your own thoughts and actions.**

Researchers say there are two domains to CT:

- 1. General problem solving and logical thinking.**
- 2. Applying learned knowledge which is context specific.** You can be very good at applying CT in one domain to specific scenarios but not in another. In the 1960s, studies were carried out on air-traffic controllers, for whom high levels of CT and other cognitive skills are paramount.<sup>11</sup> When they were tested on these skills outside of their own area of expertise, their performance (as measured by ability tests) was not significantly better than anyone else. This suggests that the sophisticated cognitive abilities required by air traffic controllers, did not translate beyond their professional area. One could, however, also question whether the ability tests were designed specifically to measure CT.

There are, however, several training courses designed to improve overall general CT ability, whilst other training is aimed at improving CT in a particular context or environment.

Things to bear in mind however are:

- You can't teach everyone. It is a higher-order skill that involves the mastery of low-level skills before you even begin to tackle the CT part. For example, reading an article requires mastery of some basic reading comprehension and vocabulary skills. "Before you can begin to think critically about what I am writing, you first need to be able to understand what I am writing."
- Transferring CT from theory into practice is hard but developing cognitive flexibility and letting go of old habits, assumptions or ingrained beliefs is especially important for improving this ability. It requires motivation, willpower and practice. As with cognitive behavioural therapy (CBT), which aims to reprogramme your thoughts and reactions to an event, CT skills can be developed.

**The key aspect of training is being aware of the areas where your CT needs sharpening and having the desire, motivation and willpower to improve it.**

## The RED Model

In order to help measure and develop CT ability, Pearson has devised the RED model, where the three constituent parts of the model represent the core building blocks of CT.



### Recognise Assumptions

Assumptions are thoughts that are accepted as true without any proof. The problem with assumptions is that:

- They are often illogical.
- They may not be supported by hard facts or data.
- They may be based on previous, often very limited, experience, ignorance or confirm our biases and stereotypes about a race, gender or groups of people.

It is deceptively easy to listen to a comment or presentation or to read something on social media, and assume the information presented is true even though little evidence was given to back it up. We often assume things are true if they support our own values and views.

Examples of unfounded, but surprisingly common, assumptions are:

- If you ignore a problem, it will go away
- Most Scandinavians have fair hair
- All men are cheats
- If you've seen one you've seen them all
- Swimming straight after eating is dangerous
- Women are worse drivers than men (*whereas UK research into driving test pass rates, motoring offences, insurance claims and driving habits has revealed that – in almost every instance – women come out on top*).
- It rains all the time in London (*London has an average annual rainfall of 22 inches vs. 47 inches for New York, and Sydney has twice the average rainfall and more rainy days per year than London*).

Problems arise when decisions are made on false assumptions. By noticing and questioning assumptions we can help to reveal information gaps or unfounded logic.

We also need to examine assumptions from different viewpoints.

**A fundamental starting point to improving CT is to become more self-aware of when we are making assumptions and start to challenge our own thinking.**

### Assumptions Exercise No. 1

Think of a time when you made a decision that was wholly or in-part based on an assumption? What was the issue you were trying to resolve and what decision did you take?

Ask yourself the following:

- What did you assume or take for granted?
- What were the facts from the assumptions and opinions?
- Did you ask or consult with others to check if your assumptions were sound?
- Did the outcome support your assumptions?

### Assumptions Exercise No. 2

Select a newspaper or magazine feature article or online news story to search for assumptions. Make a list of the assumptions the article contains. For each assumption you list, explain why it is an assumption and not a fact. (The eight steps shown under the heading Fake News may help you in this).

Article Title	Assumption	Why is it an assumption & not a fact?
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## Case Study: Launching a Telecommuting (Working From Home) Programme

Because of technology improvements at a medium-sized accounting firm, it became feasible for many employees to start telecommuting several days a week. But the idea never got off the ground - though accountants and others were asking to telecommute, the president of the firm held fast to his rule that all employees had to come into the office every day.

He never fully explained his reasons to the employees, and never delved into them himself. He just didn't like the idea. But to his credit, after some time, the president realised he had certain unexamined assumptions and personal biases about telecommuting. Among them:

- **Employees get less work done at home.**
- **There would be resentment among employees who, because of the jobs, would not be candidates for telecommuting.**

The president decided to challenge those assumptions. He tracked down studies on telecommuting and consulted with colleagues at other companies. He also learned that some of his accountants weren't working seamlessly with global colleagues because they felt pressure to keep to a 9 to 5 schedule that valued face

time over results. To help reach a conclusion, he built a decision matrix where he listed possible alternatives (e.g., no telecommuting, company-wide telecommuting, telecommuting for select jobs only, etc.) and carefully evaluated each according to criteria deemed critical to business success and employee morale.

Based on his careful evaluation, he concluded that telecommuting would not cause the problems he expected, and would likely increase productivity because accountants would be happier. He implemented a trial program, which was a success, and a year later made it permanent.

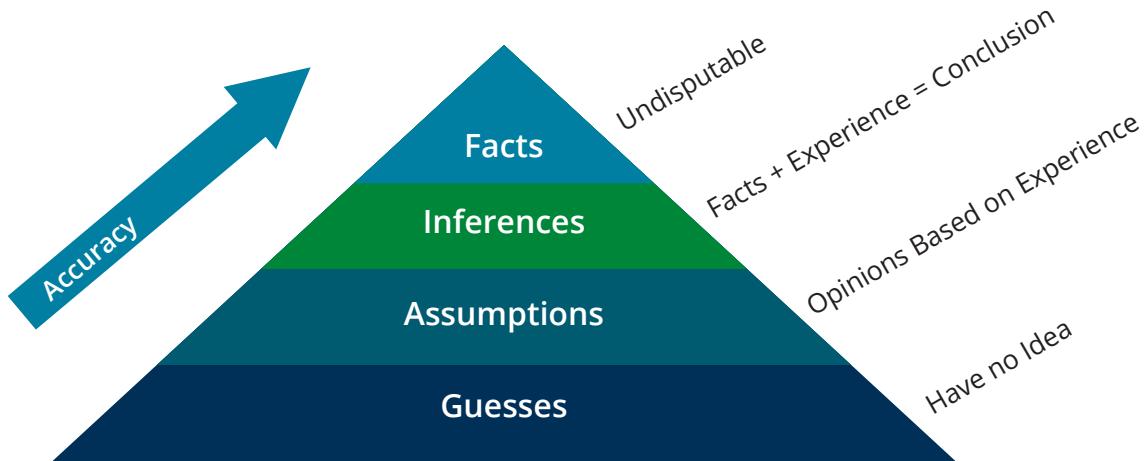


## Evaluate Arguments

The art of evaluating arguments entails analysing information and alternate views objectively and accurately, questioning the quality of supporting evidence and understanding how emotion influences the situation. Common barriers include confirmation bias (where we seek only information to support our views) or allowing emotions to get in the way of objective evaluation.

When evaluating an argument, the level of accuracy of information ranges from guesses and hunches to hard, undisputable facts.

### Evaluating Information



## Inferences

An inference is a conclusion a person can draw from certain observed or supposed facts. The problem lies when someone makes an incorrect inference. Take this example:

You pass by a house and you notice that the lights are on and voices can be heard coming from inside. You might infer that someone is at home. But this inference may or may not be correct. Possibly the people in the house have gone out but they left the lights and TV on?

Without knowing for sure what is correct (a hard fact) you might make the wrong inference.

### Evaluating Arguments Exercise

Listen to or read an article that contains an argument.

Every time you hear or see something to support the argument, write it down and score whether it is:

1. An undisputable fact
2. An inference
3. An assumption or personal opinion (based on prior experience or knowledge)
4. A guess or a hunch

If you have noted any points as undisputable facts, what evidence supports this?

CT is comprised of two parts to an argument: an issue and a reason. This leads to a conclusion and if the process has been effective, a good decision.

## Issues

Issues are generally about facts or values. In other words, they are what is being argued about or the question that is being addressed. It is difficult to argue against hard facts except that one must question the source and accuracy of facts to prove their robustness and thus, solidify acceptance.

A good example is the argument about climate change and global warming:



Despite the views of a number of experts to support the contention that the Earth is heating rapidly due to human activity leading to increasing levels of CO<sub>2</sub> and other greenhouse gas emissions, in the absence of conclusive proof, there are a number of alternative arguments that should be considered.

Others, argue that global warming over the 20th century is a result of natural fluctuations in the sun's heat and ocean currents, and that the planet is capable of absorbing the increased levels of gases. They argue that there have been previous climate changes (such as ice-ages) which are not attributable to human activity.

Scepticism itself is an important aspect in CT but there are times when the evidence, whilst not indisputable, should be taken if not as fact, then as close to fact as can be reasonably supported.

Value issues deal with what is considered right or wrong. One's values are often experiential, deeply held and subjective, so it is often hard to see another person's point of view in an argument. Examples of value issues could be "should couples live together without being married?" or "are guns are too freely available in the USA?". Many people have strong and deeply held views about these subjects.

**Good critical thinkers do not need to change their values, but they should be prepared to consider and evaluate issues objectively.**

## Evaluate Arguments

### Reasons

Before making up their mind and reaching a decision a good critical thinker will reason. Reasons are the statements that provide support for conclusions. Without reasons, you have no argument; Reasons are called evidence or justifications. This is where many arguments fail because the evidence is poor, riddled with bias, assumptive or the other party simply refuses to believe it.

When evaluating arguments, here is a useful checklist you can reference.

- Do I have all of the necessary information?
- Is the information relevant and accurate?
- Am I considering information contrary to what I believe to be true or go against my values?
- Am I evaluating the information objectively (without bias)?

### Draw Conclusions

Once an issue has been defined and reasoning conducted, we need to draw a conclusion. A conclusion, in terms of CT, is often called a viewpoint, position or opinion. A conclusion to the question "should couples live together without being married" could be a simple yes or no. Whilst this may be a strongly held personal view, a critical thinker is open to hearing new evidence and may change their opinion on issues, as new information becomes available.

Bringing diverse information together to arrive at conclusions that logically follow from the available evidence is crucial when making a decision. People who can do this are careful to not inappropriately generalise beyond the evidence and can change their position when the evidence warrants doing so. They are often characterised as having "good judgment." This skill is particularly important in lawyers, which is why CT is regarded as a must have ability in legal professionals.

Gathering, analysing, evaluating, and synthesising credible evidence to make a decision is what learning - and CT - is all about.<sup>12</sup>



When faced with finding a logical solution to a problem, **Pearson's five step model** to improving CT is a simple model that can be applied to help individuals to reframe their assumptions, identify any unconscious bias and to think differently.

This is then followed by a reflection of the effectiveness and impact of the decision.

### Five Steps to Critical Thinking

#### 1. Stop and Think

Determine what's going on and what you are trying to accomplish. Take time to reflect and set direction.

R

#### 2. Recognise Assumptions

Distinguish facts from opinions; check for implicit assumptions. Make sure you are solving the right problem.

E

#### 3. Evaluate Information

What information is needed? Is it relevant/accurate? Efficiently and objectively process information.

D

#### 4. Draw Conclusion

Does the conclusion fit the evidence? Achieve my goals? Make sure the conclusion logically follows from the information.

#### 5. Plan of Action

Type of plan needed? Resources needed? Have a plan to implement any decisions.

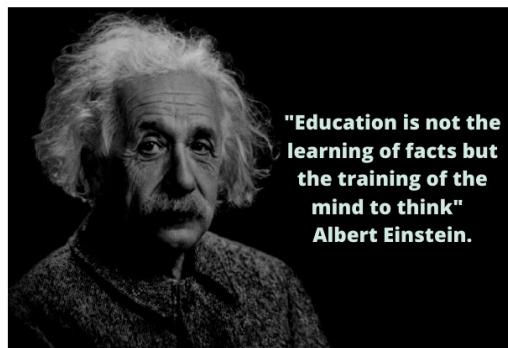
# What Makes Developing Critical Thinking Challenging?

Perhaps the main barrier to developing effective CT has been a lack of awareness of what it actually is and how important it is as a skill. Numerous surveys show that CT is a key skill required in both students and many workers, yet few people can define what it is whilst the majority of educational institutions and organisations do little to support its development in students and staff respectively.

In academic terms, there can sometimes still be an aversion to CT training, as it can be perceived as being too academic and abstract to be engaging. Whilst the various examples of literature on the topic earlier in this study illustrate an increase in awareness, it certainly does not seem to be mainstream just yet. The actual curriculum and method of teaching and learning can stifle CT. Learning by rote and regurgitating facts without being able to question or debate various viewpoints does little to enhance CT. There could also be an issue around the word 'Critical', which for many has negative connotations. However, this last point is purely an assumption, so should not be taken as fact!

On this note, creative problem-solving sounds more fun and is something that educators and trainers will happily include in sessions. In the workplace, many people prefer to strategise, brainstorm and come up with lots of ideas rather than start applying logical evaluation to them.

Perhaps now, though, given the need for our CT skills themselves to change, we probably need to consistently pay attention to and work on our own CT skills. This process begins with



heightening our awareness of how readily we absorb and believe information. One of the key things we could start with, is something as simple as managing how we use our smart-phones and access news via social media.

## CT and Organisational Culture

In the workplace, the management or organisational culture can stifle CT. An environment where staff feel that questioning superiors is seen as career limiting does little to promote CT. There are many examples of businesses suffering or even folding because of poorly thought-out or even reckless decisions.

Subsequent analysis of what went wrong often points to authoritative or dictatorial senior management making decisions without considering any of the evidence or listening to any questions. Some organisations state they want their staff to think critically, when in fact they just want subservient staff who do not question any decisions.

This does not mean you should never take risks. At some point, everyone takes risks and makes decisions without having all the information they would like and sometimes, particularly in times of crisis, decisions need to be made quickly and orders followed, without question. There are however, numerous examples when organisations have suffered as a result of decisions being made that are not supported by CT. In some organisations anyone questioning or challenging the assumptions of management or offering counter arguments is seen as "not on board" or a "trouble maker". Have you ever heard comments like this in your organisation?

- "If you're not on board then get off the bus."
- "Challenging or asking questions is career limiting"
- "We tried that before and it did not work."
- "I always agree with what my boss says."

All of these may indicate a culture where CT is not encouraged.

## Measuring Critical Thinking Ability

Before embarking on any development intervention, it is useful to measure the current levels of an individual's CT. The most established and well-known test globally is the Watson-Glaser™ Test of Critical Thinking Ability (WGCTA). This measures someone's ability in five areas of CT (recognising assumptions, evaluating arguments, drawing inferences, deducing and interpreting). Once the test is completed, the report depicts an overall score as well as scores in three individual areas, shown in the RED model (where infer, deduce and interpret scores are combined into Drawing Conclusions).

Many organisations use the WGCTA to measure the levels of CT in applicants to jobs and higher educational courses.

Others use the assessment and resulting development report to pinpoint where an individual's strengths and development areas lie, whilst the report provides suggestions for coaching activities and exercises.

### The Watson-Glaser Development Report

Pearson TalentLens has developed an in-depth development report based on Watson-Glaser scores and the RED model.

The report narrative is directed primarily toward the individual (e.g., "You scored higher than most of your peers"). Best practices in the training and development literature suggest that the report is more effective when combined with interventions, such as coaching, classroom training, e-learning, and/or structured self-study. It is important to note that certain cognitive abilities that facilitate effective CT (e.g., working memory and reading ability) are unlikely to change through developmental intervention. Still, CT can be improved when efforts focus on improving knowledge and behavioural skills (Halpern, 1998; 2003).<sup>13</sup>

To help individuals build their CT skills, the report offers multiple, customised development tips and suggestions. The suggestions are based on the individual's subscale score ranges meaning they receive a different set of suggestions depending on whether their scores lie in the "high range" (Strength to Leverage), in the "average range" (Further Exploration), or in the "low range" (Opportunity for Development).

To enable individuals to translate the results into their day-to-day experiences, structured space is provided for them to reflect on the meaning of their results and the development suggestions that seem most useful to them.

The report also provides guidance to help individuals apply knowledge of their CT skills to key workplace competencies.

#### How Your Report is Organised:

- The **RED** Model
- Understanding Critical Thinking
- Snapshot of Your Critical Thinking Skills
- Applying Critical Thinking to Your Work
- Planning Your Development
- Progressing With Next Steps

The report concludes with suggestions for next steps that individuals should take to continue developing their CT instead of growing. In total, the [Watson-Glaser Development Report](#) offers individuals key insights, suggestions, and structured guidance to promote the growth of their CT skills.

# Fake News

Fake news is nothing new, but in the past few years it is a term that is being increasingly used. The increasing spread of “fake news” has also led to a greater interest in CT to help combat it.

With the explosion of the Internet and increase in news channels via social media, it's easier than ever to spread news stories. There is a tendency to just absorb small, bite-sized snippets of news or sensational headlines that may reinforce our viewpoint (or confirm our biases) but are unable to be substantiated or may even be false.

Fake news is now seen by many, as one of the greatest threats to democracy and free debate. Indeed, a recent report by a Parliamentary committee in the UK states exactly this.<sup>14</sup>

Researchers from Oxford University, released a report in September 2019 in which they identified that **'At Least 70 Countries Have Had Disinformation Campaigns'** – campaigns which seek to spread disinformation, discredit others, or affect views.<sup>15</sup>

A search on the topic demonstrates the concern held by several countries' governments. There is, however, a sizeable proportion who view the findings of surveys and polls about fake news, as biased information or fake news itself. Many believe that there are too many experts, many of whom have been proven wrong on previous occasions.

Take the contradictory headlines in three reputable UK broadsheet daily newspapers following the publication in the British Medical Journal of a large 2016 study carried out on 70,000 people on the effects of the drugs, statins that lower blood cholesterol levels.

The controversial findings argued that if you have a high LDL (bad) cholesterol level when you are aged over 60, you will live longer, there is no increased risk of cardiovascular disease and that statins will have little effect.

### Don't throw away your statins yet - LDL cholesterol is still probably bad for you

A new study has claimed that there's no link between LDL cholesterol and mortality in the elderly, but the majority of evidence disagrees



▲ Statins are extremely commonly prescribed, but until recently they have been recommended only in people at high risk of cardiovascular problems, and that means people with high LDL cholesterol levels. Photograph: Alamy

### Bad cholesterol 'helps you live longer'



The reviews by experts, however, included:

**"They relied on limited, aggregated and inconsistent information...an approach liable to bias"** John Danesh, British Heart Foundation Professor of Epidemiology

The study reaches **"completely the wrong conclusion. In fact, we know that cholesterol is just as important as a cause of heart disease in older people as it is in the young."** Colin Baigent, Professor of Cardiovascular Epidemiology University of Oxford

You can read the whole article yourself to make up your own mind about the article's findings.<sup>16</sup>

Most people have a tendency to seek sources of information (TV shows, newspapers or social media commentators) that support their viewpoint but with the explosion of the Internet and sources of news, it has never been easier to do this. It is hard to find sources of news that are totally without bias but to label any facts or views that disagree with your own as fake without objectively evaluating them is contrary to CT. It is important to note that satire can sometimes be mistaken for fake news.

The International Federation of Library Associations and Institutions (IFLA) published a useful summary to assist people in recognising fake news.<sup>17</sup> Its main points are:

- Consider the source (to understand its mission and purpose)
- Read beyond the headline (to understand the whole story)
- Check the authors (to see if they are real and credible)
- Assess the supporting sources (to ensure they support the claims)
- Check the date of publication (to see if the story is relevant and up to date)
- Ask if it is a joke (to determine if it is meant to be satire)
- Review your own biases (to see if they are affecting your judgment)
- Ask experts (to get confirmation from independent people with knowledge).

# HOW TO SPOT FAKE NEWS

The infographic is titled "HOW TO SPOT FAKE NEWS" in large white letters on a black header. Below the title, there are eight sections, each with a red icon and a title. The sections are:

- CONSIDER THE SOURCE**: Click away from the story to investigate the site, its mission and its contact info. (Icon: person thinking with a question mark)
- READ BEYOND**: Headlines can be outrageous in an effort to get clicks. What's the whole story? (Icon: magnifying glass over a newspaper)
- CHECK THE AUTHOR**: Do a quick search on the author. Are they credible? Are they real? (Icon: quill pen)
- SUPPORTING SOURCES?**: Click on those links. Determine if the info given actually supports the story. (Icon: stack of documents)
- CHECK THE DATE**: Reposting old news stories doesn't mean they're relevant to current events. (Icon: calendar)
- IS IT A JOKE?**: If it is too outlandish, it might be satire. Research the site and author to be sure. (Icon: mask)
- CHECK YOUR BIASES**: Consider if your own beliefs could affect your judgement. (Icon: scales of justice)
- ASK THE EXPERTS**: Ask a librarian, or consult a fact-checking site. (Icon: owl)

At the bottom, there is a footer with the IFLA logo and the text "International Federation of Library Associations and Institutions".

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## About Us

TalentLens, a Pearson business, publishes psychometric assessments that are used globally to hire and develop the 21st century workforce. Our instruments measure critical thinking, problem solving, and a range of job skills to deliver data-driven insights that inform and clarify an organisation's human capital decisions. Learn more at [TalentLens.co.uk](http://TalentLens.co.uk) or call 0345 099 1485.

