



TEACHING AND LEARNING

AN EDUCATION PROBLEM: A TECH-LED EROSION OF CRITICAL THINKING SKILLS

Adrian O'Connor discusses the importance of developing critical thinking skills for undergraduate sport and exercise science students.



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In the pursuit of building knowledge, skills and abilities that will make graduate students more productive, more creative, more innovative, and more employable people, there can be little argument against the recognition of critical thinking as a central competency and life skill for all university students (Zakus, Malloy & Edwards, 2007). A subset of this overall student population is the 110,000+ students that formed the 2024/25 body studying 'biological and sport sciences' at UK higher education institutions (HESA, 2026). Whilst technology is central to sport sciences and education in general, the findings of a HEPI (2026) survey into the use of AI showed that 94% of undergraduate students use artificial intelligence (AI) in some form for assessed work in Higher Education (HE). The danger here is obvious and worrying, namely the dependency and reliance on tech leading to the outsourcing of thinking, and the erosion of the development of wider critical thinking skills in our undergraduate population.

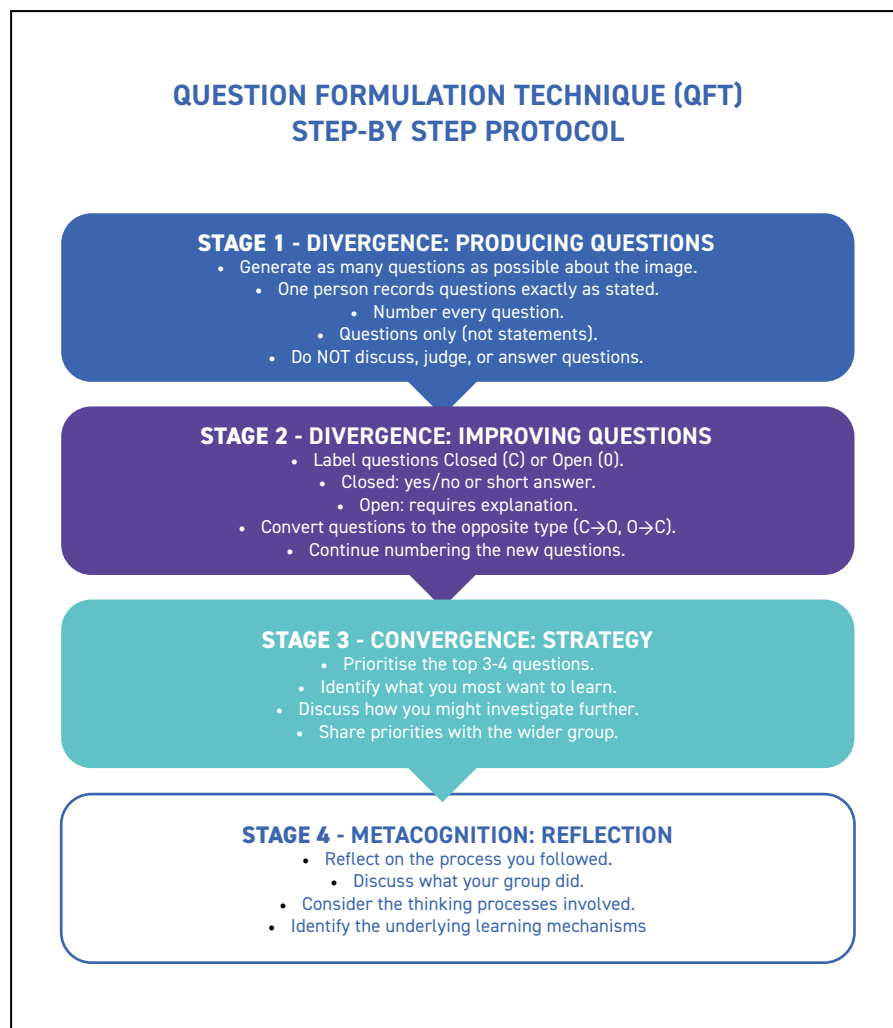
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▼ **Figure 1:** The Question Formulation Technique (QFT) step-by-step protocol illustrating the four stages of the process: divergence (question generation), divergence (question improvement), convergence (prioritisation and strategy), and metacognitive reflection.



It is undeniable that one major advantage of technological advancement is the potential time saved for tasks. However, this temporal aspect with the conditioning for immediacy is a particular concern – split second instantaneous decisions made hundreds of times a day on potentially factually inaccurate and unreliable short form video to watch on platforms such as YouTube or Tik-Tok (Kankova & Matthes, 2026). Volume and speed of entertainment for students taking precedence over deeper thought, consideration and reasoning of more complex sport science concepts.

Nobel prize winner Daniel Kahneman described this rapid evaluation as system one thinking in *Thinking, Fast and Slow* (2011); the human brain typically favouring things which are easy to digest, cognitively inexpensive, where the brain's limited resource of attention and processing capacity are being utilised efficiently

but not necessarily effectively. It could be argued that many current undergraduate students are becoming less cognitively engaged and thinking less like scientists. Students are being lured away from the staple life skill of critical thinking that HE has traditionally always nurtured and developed. We need students to slow down, to stop, to take the time to think. The practical question is how do we do this?

AN EDUCATIONAL SOLUTION: THE QUESTION FORMULATION TECHNIQUE

As academics and educators, we understand that the lifeblood and true essence of critical thinking is the creative ability to ask more questions, to be able to ask better questions. For our students, by the final year of their undergraduate degrees formulating questions for dissertation projects is exactly what we want, what we ask, and what we expect them to do. Ask any dissertation supervisor though,

it is notoriously, and seemingly increasingly challenging for some (too many?) students to think critically in general, let alone develop high-quality research questions.

Is the Question Formulation Technique (QFT) activity one of the solutions to this problem? Developed and refined over decades, the Right Question Institute (RQI) have created a simple yet beautifully effective 'slowing down to speed up' critical thinking activity: the QFT. After having initially learned about the QFT through Harvard University, employing it in case study fashion over the last two years I have used this with sports students and embedded this intellectual, 45-minute or so rule-based activity weekly within a first year undergraduate Research and Debates in Sport module to foster and advance critical thinking skills. The process of the activity takes learners through distinct conceptual stages at the heart of critical thinking skills: *divergence*, *convergence*, and *metacognition*.

OVERVIEW: THE PROCESS OF THE QFT ACTIVITY

Stimulus

Students are organised into small groups of four or five. They are then presented with a stimulus image on the main screen of the classroom or lecture hall. Typically, this could or would be some sort of thought-provoking everyday image (e.g., physiological - picture of an athlete lying down exhausted at the end of a race, or social-psychological perhaps - a coach under pressure from the media in a post-event interview). It could be anything but works particularly well if it is something that pertains to the subject area.

Divergent thinking

The students' remit is to, without any discussion whatsoever at this stage, generate as many questions as they possibly can from the stimulus image provided (e.g., How long was the race? Is the athlete okay? Was she adequately hydrated? Is she a professional athlete?). One student is tasked with writing down the questions exactly as they are stated to form a numbered list of questions. When this has been completed, students are directed as a group to discuss and classify those questions as either open or closed questions by adding a "C" or an "O" at the end of each question. The next step is to then turn each of these

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“C” and “O” questions into the opposite so that questions that were open are reworded as closed and vice versa, creating a new list of questions which follows on from the original list of generated questions. By now students realistically could easily have 30, 40, or even 50+ questions combined in total from the two lists.

Convergent thinking

Next, students then as a group discuss their questions, agreeing, prioritising, focusing and narrowing down into the three or four of what they consider as the most interesting questions from their list. Following this, they refine and strategise as to what steps they would now need to take to explore and investigate the questions they have settled on; thinking about the practical actions they would need to implement.

Metacognitive thinking

The final part is to have students reflect on the whole process, getting them to think about their thinking. What steps did they take? How did it shape their thought process? Where did their curiosity take them? What impact did the perspectives of others have?

VALUE ADDED AND POSITIVE STUDENT AND LEARNER OUTCOMES

Adopting the QFT provided the opportunity to regularly engage the learners and take them to a more interesting, more creative, more critically considered place. Repeating the activity weekly was essential in getting the students to become comfortable with the nature of the process. Students described the activity as stimulating, challenging and highly engaging, with one student observing: *“it fried my brain but in a good way, can we do it again next week?”*. As noted in reflective module survey feedback, the outcome is students becoming better interrogators of their own thought processes. The benefits are further reflected in higher average assessment grades positively impacting student attainment. Positive implications then for the Office of Students (OfS)

continuation and completion B3 metrics for the undergraduate programme and institution.

Despite the necessity of technology, AI, and digital literacy, the skills of human creativity and analysis are still listed by the World Economic Forum as in the top 10 of the fastest growing skills needed across industry by 2030 in their Future of Jobs Report (WEF, 2025). A practical illustration of using the QFT with a wider organisational application and skills development scope, is where I have also used it outside HE with Dr Chris Shambrook, one of Team GB’s most successful Olympic sport psychologists, and his team of business performance coaches working in the corporate world. The underpinning philosophy of their work is that if people prepared for work like elite athletes prepare for competition, then they would get much better results (PlanetK2, 2026): the transfer and application of high-performance sports science principles to business. Introducing the QFT to them has helped them incorporate and implement it into their bespoke training programmes on leadership, motivation, confidence, group dynamics and team cohesion for commercial organisations. This links the high-performance demands of elite sport, the high-performance demands of the business world, and the high-performance skill of critical thinking. In Dr Shambrook’s own words, it adds ‘huge value’ and further highlights the adaptability of the QFT as a tool to promote and develop critical thinking across athletic and employment environments that demand it for the highest level for success.

Linking this to the perspective of HE institutions and employment, the final B3 metric of progression for ‘positive student outcomes’, that is “students progressing into managerial or professional employment, further study or other positive outcomes”, is most likely to be impacted significantly by pedagogical practice which utilises innovative and creative approaches such as the QFT to develop critical thinking skills in students and learners ■

REFERENCES

- HEPI. (2026).** (accessed 16th March 2026) - <https://www.hepi.ac.uk/reports/student-generative-ai-survey-2026/#:~:text=AI%20use%20is%20now%20almost,teaching%20and%20assessing%20AI%20skills>.
- HESA. (2025)** (accessed 6th March 2026) - <https://www.hesa.ac.uk/data-and-analysis/students/whos-in-he/characteristics>
- Kahneman, D. (2011).** Thinking, fast and slow. Farrar, Straus and Giroux.
- Kankova, J., & Matthes, J. (2026).** Think twice, scroll once: Encouraging critical reflection as a shield against health misinformation and overgeneralized messaging by social media influencers. Computers in Human Behavior, 177, 108896 <https://www.sciencedirect.com/science/article/pii/S0747563225003437>
- PlanetK2. (2026).** (accessed 31st March 2026). - <https://www.planetk2.com/>
- World Economic Forum. (2025)** (accessed 6th March 2026) - <https://www.weforum.org/publications/the-future-of-jobs-report-2025/in-full/3-skills-outlook/>
- Zakus, D. H., Malloy, D. C., and Edwards, A. (2007).** Critical and ethical thinking in sport management: Philosophical rationales and examples of methods. Sport Management Review, 2007, 10, 133-158.