The award winning UQCTP has established itself as a leader in developing expertise in teaching for thinking, having worked with thousands of educators and hundreds of educational institutions throughout Australia and internationally.

The UQCTP works to theorise and put into practice explicit and transferable schematic understanding of teaching expertise, focussing not so much on what excellent teachers do, but on what they think while they are doing it. Our collaborative networks exist to foster each teacher’s individual learning, focusing on a deep understanding of pedagogical principles to inform practice, and in which clear criteria for success allow for feedback to improve understanding.

The program developed by the UQCTP is not one for ‘implementation’, but of collaborative learning through individual practice. There is no manual or resource book. There is, however, a focus on processes and systemic change that creates an immediate shift towards expertise development in teaching for thinking.

Teaching experience within the UQCTP

While there is a strong academic focus within the UQCTP, there is also a wealth of teaching experience that informs theory and practice. In terms of practical experience, members of the UQCTP have been or are:

- State Review Panel Chairs or members in the Queensland Curriculum and Assessment Authority (QCAA)
- Lead writers or team members in the current QCAA syllabus redevelopment
- Curriculum consultants for the International Baccalaureate Organisation
- Writers for the Queensland Core Skills Test (QCS)
- Chief examiners for QCAA Senior External Examinations
- Heads of Department and teachers in private and public schools throughout Queensland
The UQCTP has also delivered professional learning to all lead writers of the 2019 Queensland syllabuses, and continues to work closely with a large number of schools and teachers in preparation for the implementation of this new suite of syllabuses.

**UQCTP research**

Apart from significant teaching and curriculum design experience, UQCTP team members are at the forefront of research in fields including Critical Thinking, 21st Century Skills, Metacognition, Philosophy for Children (P4C), STEM and Critical Thinking, Inquiry Learning, Critical Thinking in Adolescence, Virtues and Values of Effective Thinkers, Effective Thinking and Writing, Argument Mapping, and Argumentation and Critical Thinking in Science.

UQCTP staff have also been instrumental in developing framing documents on the role of critical thinking in education (see, for example, the National Initiatives & Performance Directorate, NSW Department of Education, occasional paper *On Critical Thinking and Collaborative Inquiry*).

**UQCTP Education partners**

The UQCTP has worked closely with a range of institutions to shape and share strategic goals. Our most significant partners are:

- Simon Fraser University, British Columbia, Canada
- Pepperdine University, Los Angeles, USA
- University of California Los Angeles (UCLA), Los Angeles, USA
- Department of Education, Queensland (Solid Pathways program*, IMPACT centre†)

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* The Solid Pathways program targets over 600 high performing Indigenous students throughout Queensland to improve their academic capacity and chances of success at university. This program has been operating for 5 years with great success.
† The IMPACT Centre has demonstrated significant relative gains in NAPLAN reading, writing and numeracy results through a teaching for thinking focus, outperforming target programs in numeracy and literacy.
Many other schools have worked individually with the UQCTP to develop teacher expertise throughout Queensland and overseas.

Teachers from many more schools in Brisbane and throughout Queensland have become part of the Aspiring Thinkers network through the Brisbane School of Distance Education IMPACT centre. This network has international reach and forms a basis for collaborative practice and sharing of expertise.

**UQCTP professional development clients**

The UQCTP has delivered professional development programs to educational and corporate bodies, including:

- Australian Defence Force
- Brisbane City Council
- Office of the Coordinator General
- Department of Child and Disability Services
- University of the Sunshine Coast
- University of Queensland academic staff across a variety of faculties
- Public and private schools throughout Australia and South Africa

**Shaping expertise in context**

Our partner schools and institutions do not adopt a uniform approach to the development of teacher expertise. Each has a context that is unique and hence requires local leadership. Part of the UQCTP project is to identify key people within schools to lead teaching for thinking based on a shared understanding of expertise in teaching for thinking, and to work with these people to ensure that as their expertise develops they can provide a mentoring role for others to the same end.

The UQCTP maintains that teaching for thinking is a pedagogical project, it is not a curriculum project. Thus, our focus is on teacher expertise and recognising that the most important resource a school has is its teachers.

Teachers do not require a deficit model of improvement. They have significant expertise and understanding. It is in the explicit articulation of this expertise, and integrating it with what we know that works in teaching, that we can construct mechanisms for sharing our expertise and for inducting new teachers into the profession.
Teaching for thinking: a pedagogical schema
— the pedagogical content knowledge of inquiry —
©UQCTP The University of Queensland Critical Thinking Project
Peter Ellerton, University of Queensland

Incorporating the key pedagogical issues of:
- Cognitive load theory
- Nature of expertise
- Social cognition
- Constructivism
- Metacognition
- Epistemology

Cognitive Skills
(cognitive verbs)
Things we do with knowledge
- evaluate
- analyse
- interpret
- synthesise
- identify
...

Thinking is the method of intelligent learning.
John Dewey

Content
- Organises work plans
- Provides structure in textbooks
- Wrongly associated with ‘rigour’
- Informs assessment

Inquiry
Inquiry is the process through which the cognitive skills are developed and in which feedback is provided

Values
- Applied discerningly
- At the core of professional practice
- Provide feedback on cognitive skills
- Have broad application across disciplines

Praxis

Virtues
(habits/dispositions)
- Come from mastery of the values
- Are characteristic of effective thinkers
- Create knowledge producers

Pedagogical
imperatives
(Principles of action)
- Shift the focus from knowledge to inquiry
- Work collaboratively when thinking can be shared
- Think and plan in the language of student cognition

Practice does not make perfect in the absence of understanding.
Deanna Kuhn

Expert knowledge is “tightly bound to conditions and procedures for its use”.
Robert Glaser

Key principles need to be identified that guide practice and make expertise visible, translatable and teachable.
### Values of Inquiry—supporting questions

| Clarity            | • Are your examples useful?  
|                   | • Is your argument structure clear?  
|                   | • Are your diagrams easy to understand?  
|                   | • Is your paragraph structure well-developed?  
|                   | • Are your words well-defined and unambiguous?  |
| Accuracy          | • Is your argument sound?  
|                   | • Are your claims justified?  
|                   | • Is what you are saying true?  
|                   | • Have you represented ideas faithfully?  
|                   | • How could people check on your claim?  |
| Precision         | • Is your attention to detail sufficient?  
|                   | • Have you used technical terms appropriately?  
|                   | • Have you quantified your information where appropriate?  
|                   | • Are any bullet points categorically distinct from each other?  
|                   | • Have you identified areas of vagueness or ambiguity in your topic?  |
| Relevance         | • Have you focussed on the point at issue?  
|                   | • Have you selected information supporting the topic?  
|                   | • Have you minimised distracting or unhelpful information?  
|                   | • Have you been able to identify why information is relevant?  
|                   | • Have you justified why your selection of material is relevant?  |
| Significance      | • Have you avoided superficial issues or arguments?  
|                   | • Have you identified and developed your core ideas?  
|                   | • Has your analysis identified the most significant areas?  
|                   | • Have you identified the most meaningful aspects of your topic?  
|                   | • Has your treatment of the topic focused on substantive aspects?  |
| Depth             | • Are the complexities of the issue sufficiently described?  
|                   | • Have you been thorough in your treatment of the issue?  
|                   | • Are your analogies effective and your generalisations well-justified?  
|                   | • Do your arguments consider premises that are themselves conclusions?  
|                   | • Have the problematic aspects of the issue been identified and dealt with?  |
| Breadth           | • Have you considered alternative perspectives?  
|                   | • Have you represented a broad range of alternative views?  
|                   | • Why have you preferred one perspective over another?  
|                   | • Have you sought out others for the purpose of testing your ideas?  
|                   | • Has your breadth of treatment allowed you to synthesis a new perspective?  |
| Coherence (Logic) | • Have you avoided using logical fallacies?  
|                   | • Have you avoided contradicting statements?  
|                   | • Are your ideas developed in a logical manner?  
|                   | • Do all your premises support your conclusions?  
|                   | • Have you used transition phrases to identify logical progressions?  |

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Peter Ellerton University of Queensland, Australia*
## The Critical Thinking Matrix

**A high-resolution reference source for mapping critical thinking skills**

### Cognitive Skills

<table>
<thead>
<tr>
<th>Clarity (Intelligibility)</th>
<th>Accuracy</th>
<th>Depth</th>
<th>Coherence</th>
<th>Breadth (Alternatives, perspectives, collaboration)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Categorising</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>The criteria for categorising are unambiguous and the categories are explicitly stated.</td>
<td>Geographical instructions are drawn from accurate generalisations and categorisations of characteristics, specific generalisations are avoided.</td>
<td>Categorised delimitations are relevant to questionable skills. Specific characteristics are often required. Logical and causal relationships between categories are marked.</td>
<td>Logical delimitations between categories are appropriate for the information. Logical relationships between skills and within categories are evident.</td>
<td>Alternative perspectives and shifts for categorising may be required. Preference for certain types of skills may be justified. Potential outcomes are considered.</td>
</tr>
<tr>
<td><strong>Decoding</strong></td>
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<td></td>
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</tr>
<tr>
<td>Terms are disambiguated and intrinsic meanings are discovered when, in fact, they were misunderstood or unrecognised.</td>
<td>Intrinsic meanings are disambiguated and extraneous meanings are discovered.</td>
<td>Intrinsic meanings and extraneous meanings are disambiguated.</td>
<td>Intrinsic meanings are disambiguated and extraneous meanings are disambiguated.</td>
<td>Alternative meanings resulting from other cultural or cognitive perspectives are explored. Different interpretations of the nature of intrinsic and extraneous meanings are considered.</td>
</tr>
<tr>
<td><strong>Clarifying meaning</strong></td>
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</tr>
<tr>
<td>Metaphors and idioms are identified and additional meanings are determined.</td>
<td>Metaphors and idioms are appropriately qualified.</td>
<td>Metaphors and idioms are appropriately qualified.</td>
<td>Metaphors and idioms are appropriately qualified.</td>
<td>Relevant and significant information is identified and formulated. Meaning is preserved and contextualized. Problematic aspects are identified. Logical relationships are identified and formulated. Logical relationships are identified and formulated.</td>
</tr>
<tr>
<td><strong>Examining ideas</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Procedure of investigation is made explicit. Any conceptual structures are identified and named.</td>
<td>Truthful reproduction of investigation of conceptual structures is identified and named. Logical relationships identified.</td>
<td>Logical relationships identified.</td>
<td>Logical relationships identified.</td>
<td>Logical relationships are identified and logical coherence is determined. Logical relationships are identified and logical coherence is determined. Logical relationships are identified and logical coherence is determined.</td>
</tr>
<tr>
<td><strong>Identifying arguments</strong></td>
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<tr>
<td>Arguments and conditions are made explicit. Arguments and conditions are made explicit.</td>
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<tr>
<td><strong>Assessing claims</strong></td>
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<tr>
<td>Evidence is presented in context. Direct links between evidence and claims are made explicit.</td>
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</tr>
<tr>
<td><strong>Assessing arguments</strong></td>
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</tr>
<tr>
<td>Premises, conditions and relational perspectives are articulated.</td>
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<td>Premises, conditions and relational perspectives are articulated.</td>
<td>Premises, conditions and relational perspectives are articulated.</td>
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<tr>
<td><strong>Synthesising the matrix</strong></td>
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<tr>
<td>The synthesis is developed from the constituent claims, which are made explicit.</td>
<td>The synthesis is developed from the constituent claims, which are made explicit.</td>
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<td>The synthesis is developed from the constituent claims, which are made explicit.</td>
</tr>
<tr>
<td><strong>Quarrying evidence</strong></td>
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<tr>
<td>Nature coherence is clear and relational perspectives are articulated.</td>
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<td>Nature coherence is clear and relational perspectives are articulated.</td>
</tr>
<tr>
<td><strong>Inference</strong></td>
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<tr>
<td>Premises and conclusions are made explicit.</td>
<td>Premises and conclusions are made explicit.</td>
<td>Premises and conclusions are made explicit.</td>
<td>Premises and conclusions are made explicit.</td>
<td>Premises and conclusions are made explicit.</td>
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<tr>
<td><strong>Conceptuating alternatives</strong></td>
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</tr>
<tr>
<td>Possible inherent pathways (goals of meaning articulated from current ways of considering claims and arguments). Alternative significant and potential structures are considered.</td>
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</tr>
<tr>
<td><strong>Collating</strong></td>
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<tr>
<td>Clear articulation (paths from premises to conclusions, including use of evidence and argumentation) is explicit.</td>
<td>Clear articulation (paths from premises to conclusions, including use of evidence and argumentation) is explicit.</td>
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<tr>
<td><strong>Starting results</strong></td>
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<tr>
<td>Appropriate evidence (goals of meaning articulated from current ways of considering claims and arguments). Alternative significant and potential structures are considered.</td>
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<tr>
<td><strong>Justifying procedures</strong></td>
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<tr>
<td>Effectiveness of assumptions, conclusions, hypothetical (non-evidence-supportive) conclusions and strategies are evaluated.</td>
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</tr>
<tr>
<td><strong>Preventing arguments</strong></td>
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<tr>
<td>Argumentative premises, diagrams, graphs and written schemes are conveyed in a logical argument. Adherence to conventions. Points at issue clearly defined and stated.</td>
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</tr>
<tr>
<td><strong>Meta-cognition</strong></td>
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<tr>
<td>Reflective ability is evident and the development of the matrix is evident.</td>
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<tr>
<td><strong>Self-reflexion</strong></td>
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<tr>
<td>Reflective ability is evident.</td>
<td>Reflective ability is evident.</td>
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<td>Reflective ability is evident.</td>
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