Australian Council for Educational Research (ACER)

From the SelectedWorks of Dr Pina Tarricone

August, 2018

Profile Pina Tarricone

Pina Tarricone, PhD

Available at: https://works.bepress.com/pina_tarricone/21/
Research Statement – describing my area of research, my focus, interests and what currently excites me about research in education and how I plan to contribute to it.

In the details below I provide insight into my research area, which is primarily metacognition, by outlining my research journey and my achievements to date. My description of my research journey provides a framework for describing my current focus and interests in educational research. Based on these interests, I then outline how I believe my combined knowledge and skills in educational/cognitive psychology, assessment and measurement, and interactive learning technologies can contribute to learning and research.

1) My research journey


I am passionate about understanding how we learn, including how to effectively facilitate, assess and measure learning. I worked as a Business and Information Technology teacher in secondary schools for 12 years until I realised that although I thought that I was a good teacher I wanted a deeper conceptual understanding of what learning is, including the processes and environments that facilitate it. I completed a Master of Education in Interactive Multimedia researching teachers’ perceptions of the use of interactive multimedia with students at-risk of school failure. Completing this research, and later being employed as graduate research assistant working on the instructional design of online learning environments, my interest in educational psychology constructs grew. I initially thought that I would complete a PhD thesis in online learning, however, I realized that my passion was not the learning environment specifically, but the psychological processes involved in how learning occurs.

PhD in Educational/Cognitive Psychology (2007)

So in 2002 my journey began into a PhD in Educational/Cognitive Psychology with a focus on metacognition, on a full scholarship with a stipend. My fascination with metacognition developed from my keen interest in understanding how people learn, know and apply their knowledge. When I began my PhD thesis I had planned to investigate self-system affects on metacognition during the solving of ill-structured problems. I quickly realised that my naïve view of metacognition needed to be rectified if I was to knowledgeably and accurately make connections between metacognition and ill-structured problem solving to provide a framework for an empirical study. I also realised that the fuzziness, expansiveness and complexity of metacognition limited the depth of understanding of the construct to the experts in the field. I also found that some researchers and teachers have a limited view of the construct and this was reflected in a number of papers that I read.

Considering this, early in my thesis the focus changed from an empirical study to a theoretical study with the aim to clarify the construct to provide frameworks for researchers and teachers to use. The contributions to knowledge, a taxonomy of metacognition, a conceptual framework of metacognition, and a schema of metacognition and ill-structured problem solving, involved extensive reading and the analysis of theoretical and empirical works. The expansive literature and different theoretical contributions to the construct made the task of determining what metacognition is and its specific processes a demanding, but exciting process.

In my PhD thesis I also made a significant contribution to qualitative research methodology. I developed a research design that can be applied to the analysis and synthesis of complex constructs, not just within the field of education but across fields. The research design provides a framework for exploring the psychological processes involved in complex interpretive analyses. My qualitative methodology was acknowledged by the AERA Qualitative SIG as a finalist for the 2008 Outstanding Dissertation Award.

I won the University Research Medal, Faculty Research Medal, and the Western Australian Institute of Educational Research Postgraduate Prize for my thesis. I have also won a number of other awards for my research. Professor Alison Garton and Professor Mark Hackling were co-supervisors/advisors for my thesis Demystification and reconceptualization of the intricate web of metacognition. Three international professors who are experts in metacognition examined my thesis and each awarded me a (I), which is the highest possible score. The examiners were Professor David Moshman (University of Nebraska-Lincoln, USA – Professor Educational Psychology), Professor Anastasia Efikides (Aristotle University of Thessaloniki, Greece, Professor Cognitive Psychology), and Professor Peter Afflerbach (Professor of Curriculum and Instruction, University of...
This is a rare document, one that represents an impressive synthesis of research not only within a single field related to metacognition, but across fields. This is a scholarly feat that I can praise from four perspectives. First, the amount of reading and thinking that was needed to provide the full accounting of research and theory in each of the subfields (or niches) of metacognition is considerable. Second, the author’s ability to synthesize work within each of these niches into comprehensible summaries is commendable. Third, the author is to be congratulated on the most grand of these feats: the ‘placing’ of subfields under the umbrella construct of metacognition, including representation and account of how these subfields are both different and related. Fourth, though not without challenges, the author’s personal account of inquiry offers a fairly dynamic narrative frame that helped this reader through the considerable amount of information contained in the dissertation. In summary, the author’s accomplishment with this dissertation is superior… I believe that this dissertation could be a valuable contribution to the field. I recommend that the author consider finding a publisher who will take this manuscript, with some editing for repetition, and help get the word out. (PhD examiner, Professor Peter Afflerbach, Professor of Curriculum and Instruction, University of Maryland, USA, April 2007)

I followed the advice from Professor Peter Afflerbach and Professor David Moshman, who both suggested that I publish my thesis as a book. Psychology Press, Taylor and Francis, published my research as a book titled the Taxonomy of Metacognition in 2011. My book is available in university libraries world-wide. There are sections of my thesis that I have not as yet published, including the qualitative research design and the schema of metacognition and ill-structured problem solving.  

Master of Education, Assessment and Measurement (Psychometrics) (2014)  
Graduate Diploma in Educational Assessment, Measurement and Evaluation (2009)  

After completing my PhD, in February 2007 I was awarded a full scholarship to complete a Master of Education in Educational Assessment, Measurement and Evaluation from the University of Western Australia. I worked on this degree part-time whilst working in universities, government and corporate education (see CV for work history details). I was awarded honors for my thesis, Measuring metacognition using Rasch latent trait theory. One of my examiners was Dr William P Fisher, Berkeley University USA who is an expert in survey design and Rasch measurement. I developed an instrument to measure a subcategory of the Taxonomy of Metacognition, knowledge of self and others, and analysed it using Rasch measurement. My plan is to develop more instruments to measure metacognition based on my theoretical work.

2) **My current research focus and interests**  
My expertise and research is based on three main areas: metacognition, assessment and measurement, and learning technologies. I have made a number of contributions to new knowledge in each of these areas as evidenced by my publications and recognition for my research. My CV provides my full publication list including those currently submitted, in review and those in preparation.

1. **Theoretical analysis of complex educational and cognitive psychology** specifically metacognition, and interrelated constructs and concepts including theory of mind and epistemic cognition. Metacognition is applied theory of mind and epistemic cognition is a subset of metacognition.  

   **2011 Book**  

   Interest by Psychology Press for a second edition of The Taxonomy of Metacognition.

   **2016 Book chapter publication**  

   **2014 Journal publication**  
Manuscripts in preparation


2. Rasch measurement of metacognition
I developed an instrument comprising of 40 items (37 Rating Scale items and 3 Unidimensional Unfolding items) to measure a subcategory of knowledge of cognition and declarative metacognitive knowledge, specifically knowledge of self and others as cognitive beings. The scale showed good overall fit to the Rasch measurement model with good separation measures.

2014 Thesis
Master of Educational Assessment and Measurement (with Honours) at the University of Western Australia

3. Digital assessment and measurement
The use of digital technologies for formative and summative assessment including both analytical scoring and pairwise comparison. The Rasch analysis of the functionality of analytical scoring and pairwise comparison methods in digital assessment.

2018 submitted

2017 publications


2016 publications


2014 publications


4. **Cognitive online learning tools**
I have developed an online cognitive tool to help others learn about the construct of metacognition and related concepts, as well as hermeneutic phenomenology. It is a visual cognitive non-linear teaching and learning tool depicting relationships between different concepts related to metacognition and also the relationships between these concepts. This could be very useful in educational psychology classes and for individual students.

**2014 Computer software**

**Manuscript in preparation**
Tarricone, P. (in preparation). Using online technology to promote conceptual learning in cognitive psychology: A cognitive tool to learn about metacognition.

3) **How my combined knowledge and skills can contribute to educational research and what excites me about educational research.**
What excites me about educational research is the capacity to bring about change and advancement in how people learn. It is my intention that my contributions in metacognition and educational measurement research be used to support researchers and teachers in their understanding of metacognition. I have evidence that my work has already begun to make this contribution. For example, a group of researchers have used my theoretical work to develop instruments to support the learning of gifted children (see Bannister-Tyrrell, M., Smith, S., Merrotsy, P., and Cornish, L. (2014). Taming a 'many-headed monster': Tarricone's taxonomy of metacognition. TalentEd, Vol. 28, No. 1/2, 2014: 1-12).

I hope that my work will help to facilitate the development of new pedagogies and assessment to improve metacognitive processes in both teachers and students. I am very interested in adaptive metacognition and how teachers can use their understanding of metacognition and their adaptive expertise to help improve learning outcomes and assessment. Pressley (2005) argues that “skilled teaching is heavily metacognitive” (p. 394). I also argue that assessment is highly metacognitive too. I have a manuscript on Vygotsky, teacher and student metacognitive judgements. I am keenly interested in the relationships between learning theory, and assessment and measurement. Too often real connections are not made about how to assess the actual learning processes that occur to support students to achieve their learning outcomes. I think that this is due to a lack of understanding about cognitive processes, specifically metacognition and epistemic cognition, which are fundamental for problem solving.

My aim is to continue with my metacognition theoretical and measurement work to develop instruments and use Rasch analysis to determine their functionality. I hope that these instruments could one day be commercialized. The instruments are not domain specific, which is a strength, but can be adapted to be so. They could be linked to learning environments or used to inform the development of learning environments. I am also keen to apply my schema of metacognition and ill-structured problem solving for the development of interactive learning environments. This would be exciting and innovative work. Specific interactions between the ill-structured problem solving processes and metacognition could be investigated in different contexts to determine situational influences on metacognition and problem solving processes. The schema of metacognition and ill-structured problem solving could be used by teachers, instructional designers and curriculum developers as a source of information to support the design and development of ill-structured problems which promote metacognition and facilitate the development of problem solving knowledge and skills. My plan is also to publish my work on the schema of metacognition and ill-structured problem solving as a book after I publish the second edition of the Taxonomy of Metacognition.

I am very interested in automated assessment and adaptive learning, automated scoring of learner work products and performances, and the needs of diverse learners. I believe that I can contribute my knowledge of metacognition, problem solving and assessment in the development of adaptive learning technologies. I believe that the future and challenge for adaptive learning technologies is that they be designed to mimic the scaffolding and metacognitive judgements made by teachers to support student progress. This challenge also involves implementing an instructional framework based on sound educational/cognitive psychology theory and a defined developmental continuum, within a particular domain and in authentic scenario based ill-structured problems. All of these elements, as well as the interactive design elements, should enable the student to make real learning progress and achieve the desired outcomes.

---

**Pina Tarricone, PhD**  
August 2018
My work and combined knowledge and skills in educational/cognitive psychology, assessment and measurement, and interactive learning technologies can be adapted to help inform the development of tools that can be used to determine a student’s progress on the developmental continuum, in a particular domain, by assessing their domain knowledge and their metacognitive knowledge and skills. I think that it is crucial that learning processes are scaffolded and supported in learning environments either by the teacher or a combination of teacher/cognitive learning tool.