

## PROFESSOR TOM LOWRIE

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### PUBLICATIONS

#### Books, Book Chapters and Reports

1. **Lowrie, T.**, & Logan, T. (2018). Part 1 Commentary 3. Proposing a pedagogical framework for the teaching and learning of spatial skills: A commentary on three chapters. In K. S. Mix & M. T. Battista (Eds.), *Visualizing mathematics: The role of spatial reasoning in mathematical thought* (pp. 171-182). The Netherlands: Springer
2. **Lowrie, T.**, & Logan, T. (2018). The interaction between spatial reasoning constructs and mathematics understandings in elementary classrooms. In K. S. Mix & M. T. Battista (Eds.), *Visualizing mathematics: The role of spatial reasoning in mathematical thought* (pp. 253-276). The Netherlands: Springer.
3. **Lowrie, T.**, Downes, N., & Leonard, S. (2017). STEM education for all young Australians: A Bright Spots Learning Hub Foundation Paper, for SVA, in partnership with Samsung.
4. Perry, B., MacDonald, A., Greenless, J., Logan, T., & **Lowrie, T** (2016). Reflections on the MERGA research review 2008-2011: Taking stock. In K. Makar, S. Dole, J. Visnovska, M. Goos, A. Bennison, K. Fry (Eds.), *Research in Mathematics Education in Australasia: 2012-2015* (pp 13-27). Singapore: Springer.
5. **Lowrie, T.**, & Jorgensen, R. (Eds.). (2015). *Digital games and mathematics learning: Potential, promises and pitfalls*. Rotterdam, The Netherlands: Springer.
6. **Lowrie, T.**, & Jorgensen, R. (2015). Digital games and learning: What's new is already old? In R. Jorgensen & T. Lowrie (Eds.), *Digital games and mathematics learning: Potential, promises and pitfalls*. Rotterdam, The Netherlands: Springer.
7. **Lowrie, T.** (2015). Digital games, mathematics and visuospatial reasoning. In R. Jorgensen & T. Lowrie (Eds.), *Digital games and mathematics learning: Potential, promises and pitfalls*. Rotterdam, The Netherlands: Springer.
8. **Lowrie, T.** (2014). Rural and remote mathematics education. In S. Lerman (Ed.), *Encyclopedia of Mathematics Education* (pp. 532-534). Dordrecht, The Netherlands: Springer. <http://link.springer.com/referencework/10.1007/978-94-007-4978-8>
9. Bobis, J., Mulligan, J., & **Lowrie, T.** (2012). *Mathematics for children: Challenging children to think mathematically* (4th ed.). Frenchs Forest, NSW: Person Education Australia.
10. **Lowrie, T.** (2012). Visual and spatial reasoning: The changing form of mathematics representation and communication. In B. Kaur, & T. T. Lam (Eds.), *Reasoning, communication and connections in mathematics: Yearbook 2012, Association of Mathematics Educators* (pp. 149-168). Singapore: World Scientific.
11. Perry, B., **Lowrie, T.**, Logan, T., MacDonald, A., & Greenlees, J. (Eds.). (2012). *Research in mathematics education in Australasia 2008-2011*. Rotterdam, The Netherlands: Sense Publishers.
12. **Lowrie, T.**, Greenlees, J., & Logan, T. (2012). Assessment beyond all: The changing nature of assessment. In B. Perry, T. Lowrie, T. Logan, A. MacDonald, & J. Greenlees (Eds.), *Research in mathematics education in Australasia 2008-2011* (pp. 143-165). Rotterdam, The Netherlands: Sense Publishers.

13. **Lowrie, T.**, Logan, T., & Scriven, B. (2012). Perspectives on Geometry and Measurement in the Australian Curriculum: Mathematics. In B. Atweh, M. Goos, R. Jorgensen, & D. Siemon (Eds.), *Engaging the Australian Curriculum: Mathematics - Perspectives from the field* (pp. 71-88). Online publication: Mathematics Education Research Group of Australasia. Retrieved from <http://www.merga.net.au/node/223>
14. Ewing, R., **Lowrie, T.**, & Higgs, J. (Eds.). (2010). *Teaching and Communicating: Rethinking Professional Experiences*. South Melbourne, VIC: Oxford University Press.
15. Ewing, R., & **Lowrie, T.** (2010). Setting the scene: The current teacher education context. In R. Ewing, T. Lowrie, & J. Higgs (Eds.), *Teaching and Communicating: Rethinking Professional Experiences* (pp. 3-11). South Melbourne, VIC: Oxford University Press.
16. **Lowrie, T.**, & Higgs, J. (2010). Theories of communication. In R. Ewing, T. Lowrie, & J. Higgs (Eds.), *Teaching and Communicating: Rethinking Professional Experiences* (pp. 12-21). South Melbourne, VIC: Oxford University Press.
17. Smith, T., & **Lowrie, T.** (2010). Communicating collaboratively with peers, mentors and supervisors. In R. Ewing, T. Lowrie, & J. Higgs (Eds.), *Teaching and Communicating: Rethinking Professional Experiences* (pp. 165-175). South Melbourne, VIC: Oxford University Press.
18. **Lowrie, T.** (2009). Blind faith? The mathematics of decision making within the professions. In B. Green (Ed.), *Understanding and researching professional practice* (pp. 121-134). Rotterdam, The Netherlands: Sense Publishers.
19. Dole, S., Yelland, N., Latham, G., Fehring, H., Wilks, A., Faulkner, J., Lee, L., Masters, J., **Lowrie, T.**, & Glynn, T. (2005). *Project to investigate improving literacy and numeracy outcomes of distance education students in the early years of schooling*. Canberra: Commonwealth of Australia.
20. **Lowrie, T.** (2005). Using cultural artefacts to enhance sense making in the classroom. In R. Zevenbergen (Ed.), *Innovations in numeracy teaching in the Middle Years* (pp. 51-60). Canberra: ACSA Publishers.
21. Diezmann, C., Faragher, R., **Lowrie, T.**, Bicknell, B., & Putt, I. (2004) Exceptional students in mathematics. In B. Perry, G. Anthony & C. Diezmann (Eds.), *Research in mathematics education in Australasia 2003-2004* (pp. 175-196). Flaxton, QLD: Post Pressed.
22. Outhred, L., Perry, B., Grant, J., Kuschert, K., **Lowrie, T.**, Sardelich, S., & Thomas, N. (2004). *Inquizitive maths for NSW: Stage 1A, 1B, 2A, 2B, 3A and 3B student book*. Melbourne: Pearson Education Australia. [6 books]
23. **Lowrie, T.**, & Owens, K. (2000). Making connections with space and measurement. In K. Owens & J. Mousley (Eds.), *Research in mathematics education in Australasia 1996-1999* (pp. 181-214). Sydney: University of Western Sydney Press.
24. **Lowrie, T.**, Smith, E., & Hill, D. (1999). *Competency based training: A staff development perspective* (p. 167). Adelaide: National Centre for Vocation Education Research.
25. **Lowrie, T.** (1999). All Seasons hotel chain. In T. Lowrie, E. Smith & D. Hill (Eds.), *Competency based training: A staff development perspective* (pp. 97-100). Adelaide: National Centre for Vocation Education Research.
26. **Lowrie, T.** (1999). Mission employment. In T. Lowrie, E. Smith, & D. Hill (Eds.), *Competency based training: A staff development perspective* (pp. 120-128). Adelaide: National Centre for Vocation Education Research.
27. **Lowrie, T.** (1998). The importance of visual processing in non-routine and novel problem-solving situations. In A. McIntosh & N. Ellerton (Eds.), *Research in*

- mathematics education: Some current trends* (pp. 186-210). Perth: MASTEC Publications.
28. **Lowrie, T.** (1998, December). *The purpose of assessment*. A review on the report "Assessing numeracy achievement." Commissioned by the Australian Association of Mathematics Teachers Inc: Adelaide.
  29. Smith, E., **Lowrie, T.**, Hill, D., Smith, A., Bush, T., & Lobegeier, J. (1997). *Making a difference? How competency-based training has changed teaching and learning*. Wagga Wagga, NSW: Group for Research and Training, Charles Sturt University.
  30. **Lowrie, T.** (1996). BHP Steel, Wollongong. In E. Smith, T. Lowrie, D. Hill, A. Smith, T. Bush & J. Lobegeier (Eds.), *Making a difference? How competency-based training has changed teaching and learning* (pp. 139-145). Wagga Wagga, NSW: Group for Research and Training, Charles Sturt University.
  31. **Lowrie, T.** (1996). Wollongong College of TAFE. In E. Smith, T. Lowrie, D. Hill, A. Smith, T. Bush & J. Lobegeier (Eds.), *Making a difference? How competency-based training has changed teaching and learning* (pp. 222-228). Wagga Wagga, NSW: Group for Research and Training, Charles Sturt University.

### Refereed Journal Articles

32. Resnick, I., Harris, D., Logan, T., & **Lowrie, T.** (2020). The relation between mathematics achievement and spatial reasoning. *Mathematics Education Research Journal*, 32(2), 171-174.
33. **Lowrie, T.** (2020). The utility of diagrams in elementary problem-solving. *Cognitive Development*, 55(July-September).
34. **Lowrie, T.**, Resnick, I., Harris, D., & Logan, T. (2020). In search of the mechanisms that enable transfer from spatial reasoning to mathematics understanding. *Mathematics Education Research Journal*, 32(2), 175-188.
35. **Lowrie, T.** & Larkin, K. (2020). Experience, represent, apply (ERA): A heuristic for digital engagement in the early years. *British Journal of Educational Technology*, 51(1), 131-147.
36. Patahuddin, S. M., Rokhmah, S., & **Lowrie, T.** (2020). Indonesian Mathematics Teachers' and Educators' Perspectives on Social Media Platforms: The Case of Educational Facebook Groups. *The Asia-Pacific Education Researcher*, 1-10.
37. Harris, D., **Lowrie, T.**, Logan., & Hegarty, M. (2020). Spatial reasoning, mathematics, and gender: Do spatial constructs differ in their contribution to performance? *British Journal of Educational Psychology*.
38. Harris, D., Logan, T., & **Lowrie, T.** (2020). Unpacking mathematical-spatial relations: Problem-solving in static and interactive tasks. *Mathematics Education Research Journal*.
39. **Lowrie, T.**, Harris, D., Logan, T., & Hegarty, M. (2019). The impact of a spatial intervention program on students' spatial reasoning and mathematics performance. *Journal of Experimental Education*.
40. **Lowrie, T.**, Logan, T., & Hegarty, M. (2019). The influence of spatial visualization training on students' spatial reasoning and mathematics performance. *Journal of Cognition and Development*, 20(5), 729-751.
41. Patahuddin, S. M., Ramful, A., & **Lowrie, T.** (2019). Enacting spatial visualisation: Investigating the relationship between surface area and volume of cubes. Australian Mathematics Teacher. *The Australian Mathematics Education Journal (AMEJ)*, 1(3).
42. Patahuddin, S. M., & **Lowrie, T.** (2019). Examining teachers' knowledge of line graph task: A case of travel task. *International Journal of Science and Mathematics Education*, 17(4), 781-800.

43. **Lowrie, T.**, Logan, T., & Patahuddin, S. (2018). A learning design for developing mathematics understanding: The ELPSA framework. *Australian Mathematics Teacher*, 74(4), 26-31.
44. Patahuddin, S., Lowrie, R., & **Lowrie, T.** (2018). ELPSA learning design to develop conceptual understandings of algebraic equivalence: The use of ribbons. *Australian Mathematics Teacher*, 74(4), 32-40.
45. **Lowrie, T.**, Logan, T., Harris, D., & Hegarty, M. (2018). The impact of an intervention program on students' spatial reasoning: Student engagement through mathematics-enhanced learning activities. *Cognitive Research: Principles and Implications*.
46. **Lowrie, T.**, Leonard, S., & Fitzgerald, R. (2018). STEM Practices: A translational framework for large-scale STEM education design. *Educational Design Research*, 2(1), <https://doi.org/10.15460/eder.2.1.1243>
47. Patahuddin, S.M., Puteri, I., **Lowrie, T.**, Logan, T., & Rika, B. (2018). Capturing student mathematical engagement through differently enacted classroom practices: applying a modification of Watson's analytical tool. *International Journal of Mathematical Education in Science and Technology*, 49(3), 384-400.
48. **Lowrie, T.**, & Jorgensen, R. (2018). Equity and spatial reasoning: Reducing the mathematics achievement gap in gender and social disadvantage. *Mathematics Education Research Journal*, 30(1), 65-75. doi:10.1007/s13394-017-0213-7.
49. Mutohir, T. C., **Lowrie, T.**, & Patahuddin, S. M. (2018). The Development of a student survey on attitudes towards mathematics teaching-learning processes. *Journal on Mathematics Education*, 9(1), 1-14.
50. Patahuddin, S. M., & **Lowrie, T.** (2018). Examining teachers' knowledge of line graph task: A case of travel task. *International Journal of Science and Mathematics Education*, 1-20. <https://doi.org/10.1007/s10763-018-9893-z>
51. Logan, T., & **Lowrie, T.** (2017). Gender perspectives on spatial tasks in a national assessment: A secondary data analysis. *Research in Mathematics Education*, 19(2), 199-216. <http://dx.doi.org/10.1080/14794802.2017.1334577>
52. Ramful, A., **Lowrie, T.**, & Logan, T. (2017). Measurement of Spatial Ability: Construction and Validation of the Spatial Reasoning Instrument for Middle School Students. *Journal of Psychoeducational Assessment*, 35(7), 709-727.
53. **Lowrie, T.**, Logan, T., & Ramful, A. (2017). Visuospatial training improves elementary students' mathematics performance. *British Journal of Educational Psychology*, 87(2), 170-186. doi: 10.1111/bjep.12142
54. **Lowrie, T.**, Logan, T., & Ramful, A. (2016). Cross cultural comparison of grade 6 students' performance and strategy use on graphic and non-graphic tasks. *Learning and Individual Differences*, 52, 97-108.
55. Patahuddin, S. M., **Lowrie, T.** & Dalgarno, B. (2016). Analysing mathematics teachers' TPACK through observation of practice. *The Asia-Pacific Education Researcher*, 25(5), 863-872.
56. Ramful, A., Bedgood, D., & **Lowrie, T.** (2016). A collaborative endeavour between mathematics and science educators: Focus on the use of percent in chemistry. *European Journal of Science and Mathematics Education*, 4(2), 196-213.
57. **Lowrie, T.**, & Logan, T. (2015). Students' performance on graphics-rich mathematics tasks: Interactions between gender and culture. *The Mathematics Educator*. 16(1), 91-104.
58. **Lowrie, T.**, & Patahuddin, S. M. (2015). ELPSA as a lesson design framework. *Indonesian Mathematical Society Journal on Mathematics Education (IndoMS-JME)*, 6(2), 1-16.
59. **Lowrie, T.**, & Jorgensen, R. (2015). Pre-service teachers' mathematics content knowledge: Implications for how mathematics is taught in higher education.

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60. **Lowrie, T.**, & Patahuddin, S. M. (2015). ELPSA – Kerangka kerja untuk merancang pembelajaran matematika [ELPSA – Framework for Designing Learning Mathematics]. *Jurnal Didaktik Matematika*, 2(1), 94–108.
  61. Ramful, A., Ho, S. Y., & **Lowrie, T.** (2015). Visual and analytical strategies in spatial visualization: Perspectives from bilateral symmetry and reflection. *Mathematics Education Research Journal*. 27(4), 443-470.
  62. Patahuddin, S. M., & **Lowrie, T.** (2015, March). Harnessing critical incidents for learning. *The Australian Mathematics Teacher*, 71(1), 3–8. <http://search.informit.com.au/fullText;dn=058809787706610;res=IELHSS>
  63. Jorgensen, R., & **Lowrie, T.** (2015, January 20). What have we achieved in 50 years of equity in school mathematics? *International Journal for Mathematics Teaching and Learning*.
  64. Jorgensen, R., & **Lowrie, T.** (2014). Mathematics education in rural Australia: Issues for equity and success. *Iberoamericana Journal in Mathematics and Technological Education*, 5(1).
  65. Ho, S. Y., & **Lowrie, T.** (2014). The model method: Students’ performance and its effectiveness. *Journal of Mathematical Behavior*, 35, 87-100.
  66. Logan, T., **Lowrie, T.**, & Diezmann, C. M. (2014). Co-thought gestures: Supporting students to successfully navigate map tasks. *Educational Studies in Mathematics*, 87(1), 87–102.
  67. **Lowrie, T.** (2014). An educational practice framework: The potential for empowerment of the teaching profession. *Journal of Education for Teaching*, 40(1), 34-46. doi: 10.1080/02607476.2013.864016
  68. Logan, T., & **Lowrie, T.** (2013). Visual processing on graphics tasks: The case of a street map. *Australian Primary Mathematics Classroom*, 18(4), 8-13.
  69. **Lowrie, T.**, Jorgensen, R., & Logan, T. (2013). Navigating and decoding dynamic maps: Gender preferences and engagement differences within and outside of game experiences. *Australasian Journal of Educational Technology*, 29(5), 626-639.
  70. Jorgensen, R., & **Lowrie, T.** (2013). Both ways strong: Using digital games to engage Aboriginal learners. *International Journal of Inclusive Education*, 17(2), 130-142.
  71. Diezmann, C. M., & **Lowrie, T.** (2012). Learning to think spatially: What do students ‘see’ in numeracy test items? *International Journal of Science and Mathematics Education*, 10, 1469-1490.
  72. **Lowrie, T.**, Diezmann, C. M., & Logan, T. (2012). A framework for mathematics graphical tasks: The influence of the graphic element on student sense making. *Mathematics Education Research Journal*, 24(2), 169-187.
  73. **Lowrie, T.**, & Jorgensen, R. (2012). Teaching mathematics remotely: Changed practices in distance education. *Mathematics Education Research Journal*, 24(3), 371-383.
  74. **Lowrie, T.**, & Jorgensen, R. (2012). The tyranny of remoteness: Changing and adapting pedagogical practices in distance education. *International Journal of Pedagogies and Learning*, 7(1), 1-8.
  75. **Lowrie, T.**, Diezmann, C. M., & Kay, R. (2011). The development of the Graphics-Decoding Proficiency Instrument. *Evaluation and Research in Education*, 24(4), 285-296.
  76. **Lowrie, T.**, Diezmann, C. M., & Logan, T. (2011, September 21). Understanding graphicacy: Students’ sense making on mathematics assessment items. *International Journal of Mathematics Teaching and Learning*. Retrieved from <http://www.cimt.plymouth.ac.uk/journal/default.htm>

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78. MacDonald, A., & **Lowrie, T.** (2011). Developing measurement concepts within context: Children's representations of length. *Mathematics Education Research Journal*, 23(1), 27-42.
79. **Lowrie, T.** (2011) "If this was real": Tensions between using genuine artefacts and collaborative learning in mathematics tasks. *Research in Mathematics Education*, 13(1), 1-16.
80. **Lowrie, T.**, & Diezmann, C. M. (2011). Solving graphics tasks: Gender differences in middle-school students. *Learning and Instruction*, 21(1), 109-125.
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82. Diezmann, C. M., & **Lowrie, T.** (2009). An instrument for assessing primary students' knowledge of information graphics in mathematics. *Assessment in Education: Principles, Policy and Practice*, 16(2), 131-147.
83. Diezmann, C. M., & **Lowrie, T.** (2009). The role of fluency in a mathematics item with an embedded graphic: Interpreting a pie chart. *ZDM: The International Journal on Mathematics Education*, 41(5), 651-662.
84. Diezmann, C. M., **Lowrie, T.**, Sugars, L., & Logan, T. (2009). The visual side to numeracy: Students' sensemaking with graphics. *Australian Primary Mathematics Classroom*, 14(1), 16-20.
85. **Lowrie, T.**, & Diezmann, C. M. (2009). National numeracy tests: A graphic tells a thousand words. *Australian Journal of Education*, 53(2), 141-158.
86. Goos, M., **Lowrie, T.**, & Jolly, L. (2007). Home, school and community partnerships in numeracy education: An Australian perspective. In B. Sriraman (Ed.), *International perspectives on social justice in mathematics education*. The Montana Mathematics Enthusiast Monograph 1 (pp. 7-24). Missoula: The University of Montana Press.
87. **Lowrie, T.** (2007). Learning engagement in distance and rural settings: Four Australian cases. *Learning Environments Research*, 10, 35-51.
88. **Lowrie, T.**, & Diezmann, C. M. (2007). Solving graphics problems: Student performance in the junior grades. *Journal of Educational Research*, 100(6), 369-377.
89. **Lowrie, T.**, & Logan, T. (2007). Using spatial skills to interpret maps: Problem solving in realistic contexts. *Australian Primary Mathematics Classroom*, 12(4), 14-19.
90. Clancy, S., & **Lowrie, T.** (2006). Multiliteracies: New pathways into digital worlds. *International Journal of Learning* 12(7), 141-146.
91. **Lowrie, T.** (2006). Establishing school-family partnerships in distance education contexts: Pedagogical engagement in isolated settings. *Journal of Distance Education*, 21(2), 96-114.
92. **Lowrie, T.** (2005). Problem solving in technology rich contexts: Mathematics sense making in out-of-school environments. *Journal of Mathematical Behavior*, 24(3-4), 275-286.
93. Clancy, S., & **Lowrie, T.** (2003). Pokemon meanings: Narrative constructions from multimodal texts. *International Journal of Learning*, 10 (article 93).
94. **Lowrie, T.** (2002). Designing a framework for problem posing: Young children generating open-ended tasks. *Contemporary Issues in Early Childhood*, 3(3), 354-364.
95. **Lowrie, T.** (2002). The influence of visual and spatial reasoning in interpreting simulated 3D worlds. *International Journal of Computers in Mathematical Learning*, 7(3), 301-318.

96. **Lowrie, T.** (2002). Young children posing problems: The influence of teacher intervention on the type of problems children pose. *Mathematics Education Research Journal*, 14(2), 87-98.
97. **Lowrie, T., & Smith, T.** (2002). Problem solving by another name. *Australian Primary Mathematics Classroom*, 7(2), 16-21.
98. **Smith, T., & Lowrie, T.** (2002). Pedagogy as conversation: A way of experiencing learning. *Australian Primary Mathematics Classroom*, 7(1), 18-24.
99. **Lowrie, T., & Clements, M. A.** (2001). Visual and nonvisual processes in grade 6 students' mathematical problem solving. *Journal of Research in Childhood Education*, 16(1), 77-94.
100. **Lowrie, T., & Kay, R.** (2001). Relationship between visual and nonvisual solution methods and difficulty in elementary mathematics. *Journal of Educational Research*, 94(4), 248-255.
101. **Lowrie, T.** (2000). A case of a reluctance to visualize. *Focus on Learning Problems in Mathematics*, 29(1), 17-26.
102. **Lowrie, T.** (1999). Developing mathematical power. *Australian Primary Mathematics Classroom*, 4(2), 8-12.
103. **Lowrie, T.** (1999). Posing problems and solving problems. *Australian Primary Mathematics Classroom*, 4(4), 28-31.
104. **Lowrie, T., & Smith, E.** (1999). VET teachers and Training Packages. *The Australian TAFE Teacher*, 33(1), 9-12.
105. **Lowrie, T.** (1998). Developing metacognitive thinking in young children: A case study. *Gifted Education International*, 13(1), 23-27.
106. **Smith, E., & Lowrie, T.** (1998). Staff development in the VET sector: Case studies of two providers. *Australian Journal of Teacher Education*, 23(2), 5-19.
107. **Lowrie, T., & Hill, D.** (1997). It all depends on surface area. *Journal of Science and Mathematics Education in Southeast Asia*, XX(1), 7-15.
108. **Lowrie, T.** (1996). Higher-order thinking in co-operative problem-solving situations: A case study. *Australasian Journal of Gifted Education*, 5(2), 7-11.
109. **Lowrie, T.** (1996). The use of visual imagery as a problem-solving tool: Classroom implementation. *Journal of Mental Imagery*, 20(3&4), 127-140.
110. **Lowrie, T., & Hill, D.** (1996). The development of a dynamic problem-solving model. *Journal of Science and Mathematics Education in Southeast Asia*, XIX(1), 1-11.
111. **Lowrie, T., & Hill, D.** (1996). Using a spreadsheet in the context of designing, making and appraising. *Technology and Design Education*, 7(4), 22-25.
112. **Lowrie, T.** (1995). Using visual and spatial problem-solving tasks to extend talented mathematicians within the classroom setting. *Australasian Journal of Gifted Education* 4(1), 12-15.

### Refereed Conference Proceedings

113. **Jorgensen, R., & Lowrie, T.** (2018). Speaking spatially: Implications for remote Indigenous learners. In Hunter, J., Perger, P., & Darragh, L. (Eds.). *Making waves, opening spaces* (Proceedings of the 41st annual conference of the Mathematics Education Research Group of Australasia) pp. 439-446. Auckland: MERGA.
114. **Harris, D., & Lowrie, T.** (2018). The distinction between mathematics and spatial reasoning in assessment: Do STEM educators and cognitive psychologists agree? In Hunter, J., Perger, P., & Darragh, L. (Eds.). *Making waves, opening*

- spaces* (Proceedings of the 41st annual conference of the Mathematics Education Research Group of Australasia) pp. 376-383. Auckland: MERGA.
115. Jorgensen, R., & **Lowrie, T.** (2017). Pedagogical and Mathematical capital: does teacher education make a difference? Proceedings of the 9th Mathematics Education and Society Conference, Volos, Greece.
  116. Logan, T., **Lowrie, T.**, & Bateup, C. (2017). Early Learning STEM Australia (ELSA): Developing a learning program to inspire curiosity and engagement in STEM concepts in preschool children. In A. Downton, S. Livy, & J. Hall (Eds.), *40 years on: We are still learning!* Proceedings of the 40<sup>th</sup> Annual Conference of the Mathematics Education Research Group of Australasia (p. 616). Melbourne: MERGA.
  117. **Lowrie, T.**, Logan, T., & Larkin, K. (2017). The “math” in STEM practices: The role of spatial reasoning in the early years. In A. Downton, S. Livy, & J. Hall (Eds.), *40 years on: We are still learning!* Proceedings of the 40<sup>th</sup> Annual Conference of the Mathematics Education Research Group of Australasia (p. 616). Melbourne: MERGA.
  118. Logan, T., **Lowrie, T.**, & Ramful, A. (2017). Decoding map items through spatial orientation: Performance differences across grade and gender. In Proceedings of 41st Annual Conference of the International Group for the Psychology of Mathematics Education. Singapore.
  119. **Lowrie, T.**, Logan, T., & Ramful, A. (2016). Spatial Reasoning Influences Students’ Performance on Mathematics Tasks. In B. White, M. Chinnappan, & S. Trenholm (Eds.), *Opening up mathematics education research* (Proceedings of the 39th annual conference of the Mathematics Education Research Group of Australasia, pp. 405-412). Adelaide, South Australia: MERGA, Inc.
  120. Ramful, A., & **Lowrie, T.** (2015). Cognitive style, spatial visualization and problem solving performance: Perspectives from grade 6 students. In K. Beswick, T. Muir, & J. Wells (Eds.), *Mathematics education: Climbing mountains, building bridges* (Proceedings of the 39th conference of the International Group for the Psychology of Mathematics Education, PME 39, Vol. 4, pp. 57–64). Hobart, Australia: PME.
  121. **Lowrie, T.** (2015). Mathematics education as a field of research: Have we become too comfortable? In M. Marshman, V. Geiger, & A. Bennison (Eds.), *Mathematics education in the margins* (Proceedings of the 38th annual conference of the Mathematics Education Research Group of Australasia, pp. 14–24). Sunshine Coast: MERGA, Inc.
  122. Ramful, A., & **Lowrie, T.** (2015). Spatial visualisation and cognitive style: How do gender differences play out? In M. Marshman, V. Geiger, & A. Bennison (Eds.), *Mathematics education in the margins* (Proceedings of the 38<sup>th</sup> annual conference of the Mathematics Education Research Group of Australasia, pp. 508–515). Sunshine Coast: MERGA, Inc.
  123. Ho, S. Y., Ramful, A., & **Lowrie, T.** (2015). Representations of word problems on iPad and pencil-and-paper test modes. In C. Vistro-Yu (Ed.), *In pursuit of quality mathematics for all* (Proceedings of the 7th ICMI-East Asia Regional Conference on Mathematics Education, pp. 569–578). Cebu, Philippines: Philippine Council of Mathematics Teacher Educators (MATHTED), Inc.
  124. **Lowrie, T.**, & Logan, T. (2015). The role of test-mode effect: Implications for assessment practices and item design. In C. Vistro-Yu (Ed.), *In pursuit of quality mathematics for all* (Proceedings of the 7th ICMI-East Asia Regional



- Conference on Mathematics Education, pp. 649–656). Cebu, Philippines: Philippine Council of Mathematics Teacher Educators (MATHTED), Inc.
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- Educational research in an era of uncertainty* (Proceedings of the annual Australian Association for Research in Education conference). Brisbane: AARE.
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### **Keynote Addresses / Invited Presentations**

**Lowrie, T.** (2019, March 30). *Building blocks for STEM Education*. STEMEd Conference, Canberra. [Keynote address]

**Lowrie, T.** (2018, July 26). *Engaging children with STEM Practices through play-based digital learning*. 5<sup>th</sup> Annual STEM Education Conference, Sydney. [Keynote address]

**Lowrie, T.** (2017, May 19). *STEM Practices*. Invited presentation at the Social Ventures Australia, 'STEM Learning Hub Day', Sydney. [Invited presentation]

**Lowrie, T.** (2017, January 27). *The potential of genuine artefacts within the ELPSA framework*. Invited keynote address at the Archdiocese of Canberra & Goulburn Conference, 'Students Yearn to Learn', Canberra. [Keynote address]

**Lowrie, T.** (2016, November 1-3). *The potential of genuine artefacts within the ELPSA framework*. Invited keynote address at the 4th International Symposium on Mathematics Education Innovation, 'Issues and Challenges in 21st Century Mathematics Education: Working towards Meaningful Teaching and Learning', Yogyakarta Indonesia. [Keynote address]

**Lowrie, T.** (2016, September 20). *Developing Spatial Reasoning Skills Increases Students' Mathematics Performance*. Invited presentation at the Queensland Government Department of Education and Training Research Showcase 'Uncovering the formula for maths success - student-level and school-level performance', Brisbane. [Invited presentation]

**Lowrie, T.** (2016, July 24). *The role and nature of members' affiliation*. Invited speaker at the International Commission on Mathematical Instruction (ICMI) General Assembly 2016, Hamburg, Germany. [Invited presentation]

**Lowrie, T.** & Patahuddin, S. (2016, May 12-13). *Framework: The implementation of the ELPSA model in West Nusa Tenggara*. Invited conference at the Australian Embassy, Jakarta. [Invited address and conference]

**Lowrie, T.** (2016, March 30-31). *Spatial Reasoning Program*. Invited presentation at the Numeracy Essentials Day, Catholic Education Archdiocese of Canberra & Goulburn, Canberra. [Invited presentation]

**Lowrie, T.** (2015, November 4-5). *The ELPSA framework: Engagement through mathematics inquiry*. Invited speaker at the International Conference on Mathematics, Sciences, and Education (ICMSE) 2015, Lombok, Indonesia. [Invited presentation]

**Lowrie, T.** (2015, August 22). *Numeracy research: Perspectives from near and far*. Invited keynote address at the Canberra Mathematical Association (CMA) 2015 Conference, 'Think Global: ACT Local', Canberra. [Keynote address]

**Lowrie, T.** (2015, June 29). *Mathematics education as a field of research: Have we become too comfortable?* Clements-Foyster keynote lecture at the 38th annual conference of the Mathematics Education Research Group of Australasia (MERGA), Sunshine Coast, QLD. [Keynote lecture]

**Lowrie, T.** (2015, June 16). *What is the evidence based numeracy research telling us?* Invited presentation at the Queensland Numeracy Summit 2015: Initial Teacher Education, Brisbane. [Invited presentation]

Clapper, M., **Lowrie, T.**, & Kohlhagen, S. (2015, March 19). *Teachers + students: Why isn't the equation adding up?* University of Canberra Research Festival, Canberra. [Invited Q & A session]

**Lowrie, T.**, & Patahuddin, S. (2014, August 20). "*Pedagogi Cerdas Berkarakter*" through *ELPSA Model*. Paper presented at seminar on "What the Best Teachers Do in Education in the 21st Century", IKIP Mataram, Indonesia. [Invited presentation]

**Lowrie, T.** (2012, July 2-6). *Expanding our understanding of visuospatial thinking and reasoning: Engaging and connecting the next generation of students.* Primary Teachers' Lecture at the 35<sup>th</sup> annual conference of the Mathematics Education Research Group of Australasia (MERGA), Singapore. [Invited presentation]

**Lowrie, T.** (2012, April 26-27). *Assessing mathematics digitally: The way forward?* Invited address at the Queensland Studies Authority conference, 'Shaping teaching and learning: The assessment factor', Brisbane. [Invited presentation]

**Lowrie, T.** (2012, March 3). "*If this was real*": *Tensions between using genuine artefacts and collaborative learning in mathematical tasks.* The Janet Duffin keynote lecture at the British Society for Research into Learning Mathematics conference, Manchester, UK. [Keynote address]

**Lowrie, T.** (2012, February). *An educational practice(s) framework: The empowerment of the teaching profession.* Keynote address at the Pearson Foundation International Education Summit: Asia Pacific Summit on the Teaching Profession, Jakarta, Indonesia. [Keynote address]

**Lowrie, T.** (2012, January 27-28). *Assessment in digital environments: Hasten slowly.* Invited thematic speaker at the Pearson Global Research Conference, Fremantle. [Invited presentation]

Jorgensen, R., **Lowrie, T.**, & Gates, P. (2011, July). Digital games: New potential for mathematics. Discussion Group at the 35<sup>th</sup> Conference of the International Group for the Psychology of Mathematics Education. Ankara, Turkey. [Discussion group]

**Lowrie, T.** (2011, June). *Visual and spatial reasoning: The changing form of mathematics representation and communication.* Keynote address to the annual Mathematics Teachers Conference, 'Reasoning, communication and connections', Singapore. [Keynote address]

**Lowrie, T.** (2010, August). *Primary students' decoding mathematics tasks: The role of spatial reasoning.* Invited presentation to the annual conference of the Australian Council for Educational Research, Melbourne. [Invited presentation]

**Lowrie, T.** (2008, September). *National numeracy tests: A graphic tells a thousand words*. Keynote address to the 10th annual conference of the Korea Institute of Curriculum and Evaluation, Seoul, Korea. [Keynote address]

**Lowrie, T.** (2004, December). *Making mathematics meaningful, realistic and personalised: Changing the direction of relevance and applicability*. Keynote address to the 41<sup>st</sup> annual conference of the Mathematics Association of Victoria, Melbourne. [Keynote address]

**Lowrie, T.** (2004). *Establishing visual and spatial thinking in primary grades*. Keynote address to the annual conference of the Queensland Association of Mathematics Teachers, Toowoomba, QLD. [Keynote address]