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Reclaiming and reframing
teacher education in Aotearoa New Zealand



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Special Interest Group report: Literacy and numeracy competency of ITE students

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The focus of this Special Interest Group discussion was the numeracy and literacy competency of initial teacher education (ITE) students. Issues concerning teacher content knowledge in literacy and mathematics have surfaced internationally (Schmidt et al., 2007). The United Kingdom and Australia, for example, have raised entry requirements for mathematics for ITE programmes or imposed exit competency tests on successful completion of ITE programmes (Department for Education, 2012). In New Zealand, in the primary sector, the recent introduction of mathematics, reading and writing National Standards (Ministry of Education, 2010), which need to be assessed and reported on to both parents and the government, have turned the spotlight onto teachers' competency.

The New Zealand Teachers Council, in its 2010 *Approval, Review and Monitoring Processes for Initial Teacher Education Programmes* document, mandates that on entry into early childhood, primary or secondary ITE, candidates' English language competency and numeracy competency be assessed. Those not meeting the numeracy or literacy requirements must meet these prior to graduation from a programme. ITE providers are using New Zealand University Entrance as the entry qualification for ITE undergraduate programmes and this has a numeracy and literacy component. Universities do allow mature candidates who do not formally hold University Entrance to begin teacher education programmes, but all ITE providers ask these candidates to complete a screening assessment in some form. The New Zealand Graduating Teacher Standards (New Zealand Teachers Council, 2007) also state that graduating teachers must demonstrate competency in oral and written language, numeracy and ICT relevant to their professional role.

The discussion in the Special Interest Group meeting identified five major issues particularly related to mathematics competency. It was felt that literacy competence was addressed in multiple ways during a teacher education programme but developing mathematics understanding and competence was usually confined to mathematics curriculum courses within the undergraduate degree.



Issue One: The power of the affective: Student teachers' feelings of fear related to mathematics

SIG participants noted that prior to entry to their teacher education course, student teachers have met the numeracy and literacy standards as required for New Zealand University Entrance. Participants in the SIG noted that it was necessary to support the student teachers to deconstruct their ideas of mathematics, including how it is relevant in their everyday life, and that this appears to be critical before they can take on any new knowledge. However, when the student teachers look at their own experience of mathematics many feel they are not good at mathematics and lack confidence to the point of being traumatised and fearful about teaching this subject. Life-skills studies show a general lack of mathematical proficiency across the New Zealand population (Satherley & Lawes, 2009). Metje, Frank and Croft (2007) found that taking away the fear of mathematics and increasing students' confidence in their own mathematical skills is key to teaching mathematics successfully to university students with low mathematical knowledge. As Coben (2000) states:

To be numerate means to be competent, confident, and comfortable with one's judgements on whether to use mathematics in a particular situation and if so, what mathematics to use, how to do it, what degree of accuracy is appropriate and what the answer means in relation to the context. (p. 35)

The systemic nature of problems related to mathematics competency was confirmed by an evaluation of numeracy completed across Massey University degree intakes. For example, the study found that students were arriving in the College of Science not prepared sufficiently to complete 100 level papers in the main due to the lack of mathematics knowledge and skill.

Student teachers need more support for a) changing attitudes, b) gaining understanding, and c) developing confidence. Given the fact that these attitudes have built up over an extended period of time, these are not something teacher educators can address immediately. It was also noted that support for numeracy or mathematics is not as accessible as 'literacy' support available to mature-age student teachers. There were also concerns expressed related to numeracy and literacy competence of student teachers with degrees who apply for one-year graduate programmes.

There was agreement that this is a system-wide issue with very specific challenges in terms of providing the necessary learning support that won't reinforce the related feelings of trauma or model ineffective 'traditional' teaching.

Issue Two: Transferring knowledge within and between contexts

Student teachers' poor conceptual understanding of mathematics and literacy and the lack of ability to transfer or apply knowledge to new situations was another concern that emerged during the SIG discussion. For example, on a grammar test a student may achieve well, but they don't necessarily transfer this into their academic writing. Student teachers may be able to calculate a percentage mark in a maths assessment but not understand what this represents when attempting to teach the idea. Understanding the interrelationship between concepts is vital in a teaching role. If student teachers have a sense of trauma or lack confidence around a learning area, there are issues

related to supporting the children they are teaching, developing pedagogical content knowledge embedded in each context, and designing effective contextual programmes that engage students deeply.

Issue Three: Mathematical understanding for teachers' professional lives

Learning about New Zealand curriculum mathematics and pedagogy in isolation is not sufficient to support the development of the mathematics required for teachers' day-to-day work. *The New Zealand Curriculum* (Ministry of Education, 2007), *Te Mauratanga o Aotearoa* (Ministry of Education, 2008) and *Te Whāriki* (Ministry of Education, 1996) have mathematical thinking embedded across the objectives in all learning areas. Mathematics is required for teachers' professional tasks, ranging from analysing student achievement data analysis to organising field trips. Interrogating research papers as part of teaching as enquiry and the requirement for data-informed practice has introduced new and more complex demands for teachers in relation to their mathematical and statistical literacy.

Issue Four: Do teacher educators need to reconceptualise the way we think about developing mathematical concepts knowledge and skills?

The complexity of the conceptual thinking we seek from prospective teachers and the resulting challenges need to be recognised. The SIG group questioned whether current numeracy and literacy requirements were sufficient and if raising the entry standard for ITE would minimise the issues we are experiencing. There was strong feeling that the academic standard at entry is only one aspect of selection. We need to consider people who come from diverse backgrounds, who can relate to our learners in classrooms and who have a disposition for learning. Research related to adult learning shows that adults will learn effectively when they want to learn on a need-to-know basis provided they are supported effectively (Harlow, 2013; Tertiary Education Commission, 2012). It is also critical that right from the outset the student teacher is positioned as a learner and they take responsibility for their own learning. There is a need to recognise the complexity of the teacher's role and the time that is needed to address the various aspects of being a teacher.

Reconceptualising the way we think about teaching and developing mathematics and numeracy content and skills is required and more thought put into when and where it is appropriate to do this. Mathematics curriculum courses are not the only place to develop mathematics thinking and skills. There was agreement that we do this effectively with literacy. All teacher educators need to see themselves as teachers of numeracy as well. For example, when undertaking a running record students need to understand ratios and percentages and the difference between these and they need to know the significance of stanines and what they mean in the interpretation of assessment data.

Issue Five: Assessment and diagnostic tools for numeracy and literacy competence

It was agreed that University Entrance as a selection measure for ITE is not acting as a filter for weak students. It is also clear from the discussion that institutions are

developing a range of assessment tools and the idea of sharing these was explored. For example, one SIG participant reported that people in their mathematics department have been instrumental in developing a mathematics assessment (25 items, multi-choice online). Other participants are trialling use of the *New Zealand Numeracy Assessment Tool for Adults* developed by the New Zealand Centre for Educational Research (NZCER) for the Tertiary Education Commission. Literacy selection measures are also varied and include institution-designed assessments and the use of the commercial *Diagnostic English Language Needs Assessment* (DELNA).

Of interest to the SIG group was whether or not the questions that are being asked in entrance tests actually glean the appropriate information. It is important to support student teachers to develop self-belief so they can learn the content and gain confidence and critical awareness of the importance of mathematical understanding. A brief discussion focused on the possibility of a student teacher needing to be successful in a portfolio of assessments across papers in order to fulfil the numeracy requirement.

A suggestion was to include, say, the PISA approach in entry assessment and require potential student teachers to demonstrate their ability to interpret data. The results of the Adult Literacy and Life skills (ALL) Survey in 2006 indicated that around half of New Zealand adults (aged 16–65) had low numeracy skills and lacked functional numeracy. Furthermore, around 37 percent ‘overrated’ their numeracy skills (Satherley & Lawes, 2009). Due to the exponential change in the amount of information to which people have access and need to make sense of, numeracy is now held by some to be more important than literacy in terms of functioning in society (Parsons & Bynner, 2005). Another possibility discussed was to require literacy and numeracy competence before students go on practicum. This has ramifications for opportunities for student teachers to develop critical awareness of where mathematics is used in teaching roles and also could have implications for degree completion times. However, we need to be confident that our graduates are competent in working with children in classrooms. The diagnostic assessment at the beginning of programmes should not be punitive but used to identify and develop what support is needed.

In closing, it was noted that this issue is just as critical, if not more important, at early childhood education level.

A possible action going forward is to develop a SIG area on the TEFANZ website where participants can share ideas and tools. This is an area that could be targeted by TEFANZ for further funded research.

References

- Coben, D. (2000). Numeracy, mathematics and adult learning. In I. Gal (Ed.), *Adult numeracy development: Theory, research, practice* (pp. 33–50). Cresskill, NJ: Hampton Press.
- Department for Education. (2012). Numeracy skills tests. Available from <http://www.education.gov.uk/schools/careers/traininganddevelopment/professional/b00211213/numeracy>
- Harlow, A. (2013). Learner success stories: What constitutes, and contributes to, success in tertiary vocational training courses? *Research in Comparative and International Education*, *8*(1), 27–37. <http://dx.doi.org/10.2304/rcie.2013.8.1.27>

- Metje, N., Frank, H. L., & Croft, P. (2007). Can't do maths: Understanding students' maths anxiety. *Teaching Mathematics and its Applications*, 26(2), 79–88.
- Ministry of Education. (1996). *Te whāriki. He whāriki mātauranga mō ngā mokopuna o Aotearoa: Early childhood curriculum*. Wellington, New Zealand: Learning Media.
- Ministry of Education. (2007). *The New Zealand curriculum for English-medium teaching and learning in years 1–13*. Wellington, New Zealand: Learning Media.
- Ministry of Education. (2008). *Te marautanga o Aotearoa*. Wellington, New Zealand: Learning Media.
- Ministry of Education. (2010). The national standards come into effect. Available from <http://nzcurriculum.tki.org.nz/National-Standards/National-Standards-archives/National-Standards-launch-pack/2010>
- New Zealand Teachers Council. (2007). *Graduating teacher standards*. Wellington, New Zealand: Author.
- New Zealand Teachers Council. (2010). *Approval, review and monitoring processes for initial teacher education programmes*. Wellington, New Zealand: Author.
- Parsons, S., & Bynner, J. (2005). *Does numeracy matter more?* London, England: National Research and Development Centre for Adult Literacy and Numeracy. Available from http://nrdc.org.uk/publications_details.asp?ID=16
- Satherley, P., & Lawes, E. (2009). *The adult literacy and life skills (ALL) survey: Numeracy skills and education in New Zealand and Australia*. Wellington, New Zealand: Ministry of Education. Available from http://www.educationcounts.govt.nz/_data/assets/pdf_file/0005/57452/Numeracy-Skills-and-Education-in-NZ-and-Australia.pdf
- Schmidt, W. H., Tatto, M. T., Bankov, K., Blömeke, S., Cedillo, T., Cogan, L., ... Schwille, J. (2007). *The preparation gap: Teacher education for middle school mathematics in six countries* (MT21 Report). East Lansing, MI: MSU Center for Research in Mathematics and Science Education. Available from http://usteds.msu.edu/related_research.asp
- Tertiary Education Commission. (2012). *Adult literacy and numeracy implementation strategy 2012*. Wellington, New Zealand: Author. Available from <http://www.tec.govt.nz/Tertiary-Sector/Tertiary-Education-Strategy/Literacy-and-Numeracy-Implementation-Strategy/>

