Preparing initial primary and early childhood teacher education students to use assessment

Final Summary Report

Mary F. Hill, Lisa F. Smith, Bronwen Cowie, Alison Gilmore, and Alex Gunn

May 2013

Introduction

In our rapidly changing world, in which the future is uncertain, teachers need to prepare children with knowledge, skills, values, and competencies that will support them to become life-long learners and active contributors to New Zealand's social, cultural, economic, and environmental well-being. Such an aim implies that children should be educated in ways that support them to assume control of their own learning. To that end, they will need to develop the capability to assess their own learning and progress. Vital aspects of every teacher's pedagogy, then, will be the ability to use assessment that builds, extends, and challenges children to see themselves as competent learners, and equip them with the capability to assess and guide their own learning. Taking our lead from the policy advice paper to the Ministry of Education, *Directions for Assessment in New Zealand* (Absolum, Flockton, Hattie, Hipkins, & Reid, 2009), our goal was to understand how primary and early childhood (ECE) initial teacher education (ITE) students at four New Zealand universities developed such *assessment capability*. We worked with ITE students at four universities to understand more fully how they learned to gather the assessment information that they and others require, and how to pass it on in ways that are consistent with and supportive of children's learning. And, perhaps more importantly, as teachers, to understand:

> how [children] can use and value assessment as a powerful means of furthering their own learning. As the experts in the learning partnership, teachers need to take the lead in all assessment that [children] cannot manage without support. But they need to do so in ways that encourage [children] to feel deeply accountable for their own progress and support them to become motivated, effective, self-regulating learners. To do this, teachers clearly need to be knowledgeable about the curriculum and teaching, but they also require well developed assessment capabilities and the motivation to use these to forge learning partnerships with their [children]. (Absolum et al., 2009, p. 24)

Key findings

In the main, both primary and ECE ITE students leave their programmes ready and able to begin using assessment to enhance children's learning. They demonstrate a shift in their beliefs and understandings of assessment from the time they enter ITE to the time they leave, and by exit feel confident to use assessment in their teaching. However, at exit, understandings about involving children in assessment and building children's assessment capability in the way intended by Absolum et al. (2009) and the Ministry of Education (2011) are still emergent.

Primary ITE students' assessment learning was clearly influenced by the introduction of national standards and the use of standards-based assessment. These changes overshadowed assessment learning related to other current curriculum-related priorities, such as the use of assessment to monitor and improve key competencies.

Like their primary colleagues, graduating ECE ITE students possess much wider conceptions of assessment at the end of their programmes, as compared to their time of entry. Overall, they understand a range of possibilities for appropriate assessments in ECE, such as through learning stories and involving multiple voices. They recognise the importance of documenting children's learning and the value that assessment has for families. They appreciate that it is through assessment that they view children as competent.

Major implications

There are challenges in supporting ITE students' learning of how to use assessment for multiple purposes and of how to support the children they teach to use and value assessment to progress their learning.

Initial teacher education students need experiences that prepare them to engage effectively and proactively with assessment principles, practices, and policies, so that they are equipped to use, critique, and adapt their assessment practices in the classroom or centre, and in the broader policy context.

High profile national policy requirements, such as national standards, can dominate ITE students' learning about assessment, while other equally important policy initiatives might receive less attention.

Primary and ECE ITE students used different assessment languages and had different assessment understandings due to the curriculum and contextual differences between schools and early childhood settings, reinforcing the need to tailor assessment teaching for different sectors within ITE.

The research

This project set out to address gaps in our knowledge regarding ITE students' learning about assessment in New Zealand ITE programmes. We systematically investigated primary ITE students' assessment beliefs and learning from programme entry over 3 years, for the 2010 cohort at four universities. At one of the universities, the ECE ITE students were also included. Questionnaires, interviews, and document analyses were used to examine how ITE students learned to understand and use assessment during their ITE. We also investigated teacher educators' assessment beliefs through professional conversations at each of the participating universities. In this report, our purpose is to communicate this project's key findings and implications for teacher education practice.

Background

There has been insufficient and often inconclusive research regarding how ITE students learn about assessment, their readiness to use effective assessment strategies upon graduation, and how they continue to learn to use the assessment practices known to improve children's learning. Internationally, some studies have investigated the assessment curriculum of ITE programmes to understand how ITE students learn to use assessment formatively, and how the nature of assessment practices align with ITE assessment curricula (Deluca, Searle, Shulha, & Klinger, 2009; Graham, 2005; Popham, 2008; Seigal & Wissehr, 2009). In New Zealand, studies have explored particular aspects of ITE student learning about assessment. Brown (2011) and Brown and Remesal (2012) investigated ITE students' beliefs; Smith, Corkery, Buckley, and Calvert (2012) studied the extent to which secondary ITE students felt prepared to use assessment as beginning teachers; and other related studies have explored whether interventions may be necessary to ensure that mentors of ITE students know and demonstrate how to use formative approaches (e.g., Hooker, Peters, Biggar, & Bleaken, 2008). But how ITE students engage with such content remains unknown. Following Kane (2005), who pointed to the need to understand ITE student learning through listening to their voices, this study investigated the assessment learning of ITE students in four New Zealand universities through their perceptions and those of their teacher educators. For a broader discussion of the background literature see Hill, Cowie, Gilmore, & Smith (2010).

Research questions

The research questions for this project were:

1. What do ITE students know and believe about assessment at entry, part way through and at exit from their teacher education programmes?
2. In what ways does initial teacher education, including practicum, scaffold ITE students' assessment capabilities?

Methodology and analysis

A mixed-methods approach was used, which included questionnaires, teacher educator conversations, and student interviews and focus groups. Figure 1 shows the overall design for the data collection. In this report, we focus on the 2010 entering cohort, as they were the focal participant groups for the study, and the teacher educators. The students in the 2010 exiting cohort and the 2011 entering cohort also responded to the questionnaire to provide comparative data with the 2010 cohort.

Figure 1. Design for the data collection

Type of data and number of participants	Year/Timing: 2010	Year/Timing: 2011	Year/Timing: 2012
2010 Entering cohort: Student questionnaires n (Primary); n (ECE)	On entry to ITE and at the end of year 1 720; 120	At the end of year 2 548; 94	At the end of year 3 414; 47
Student interviews and activities (n)	At the end of year 1 (23)	Ongoing (21)	At the end of year 3 (68)
Teacher educator conversations (n)	Mid-year (25)		End of year (35)
2010 Exiting third-year cohort: Student questionnaires n (Primary); N (ECE)	At the end of year 3 324; 92		
2011 Entering cohort: Student questionnaires n (Primary); n (ECE)		On entry to ITE 755; 87	

Participants

In 2010, 720 primary and 120 ECE ITE students from the four participating universities accepted the invitation to participate in the study by completing the initial questionnaire. In 2011 and 2012, the numbers of primary and ECE ITE students were 548 and 94, and 414 and 47, respectively. Approximately 75% of the 2010 cohort at each university participated. The mean age for the 2010 primary sample was 24.15 (SD = 8.71); with 75% reporting their ethnicity as Pākehā, 65% as Māori; 3% as Pasifika; 2% as Asian; and, 14% as Other (typically mixed ethnicity). These students were also invited to participate in focus groups (sometimes as class discussions) and one to one interviews, once each year during their ITE programme. Twenty-five primary ITE and 43 ECE ITE students accepted this invitation and participated in these focus groups, interviews, and class discussions, although different numbers and, sometimes, different students, participated each year.

Questionnaire respondents for the third-year students who completed their ITE in 2010 numbered 324 (primary) and 92 (ECE). Questionnaire respondents for those who entered their ITE programme in 2011 numbered 755 (primary) and 87 (ECE).

Teacher educators were invited to take part in professional conversations if they co-ordinated courses that specifically identified assessment learning in the course objectives. Between 8–12 teacher educators at each university participated, with 25 participating in total in 2010. Thirty-five participated again at the end of 2012.

Materials

A "Beliefs About Assessment" questionnaire was developed for this research. The questionnaire was framed around principles of assessment for and of learning, beliefs about approaches and methods for assessment, and assessment rigour. Based on the literature and the earlier surveys about teachers' assessment conceptions (Brown, 2004; Brown & Hirschfield, 2007), along with our combined years of experience in preparing teachers, the original questionnaire comprised 58 Likert-type items (strongly disagree, disagree, agree and strongly agree, don't know) and eight open-ended questions. The "don't know" option was included as we intended to use the findings of the questionnaire to inform debate about and changes to the assessment curriculum within each university. It also included nine open-ended questions that sought students' elaborations of their beliefs and understandings of assessment.

Following analysis of the questionnaire in 2010, the questionnaire was revised. Twelve items were removed that were either redundant or had almost no variability in the responses. The revised "Beliefs About Assessment" questionnaire comprised 46 Likert-type items and five open-ended items. The revised version of the questionnaire was used in this research from 2011, and the 2010 data were re-analysed using the revised questionnaire. Semi-structured protocols were developed for the interviews with ITE students and teacher educator conversations.

Procedure

University ethics approval was obtained from the four universities. In addition, Māori Consultation was conducted at the University of Otago. All participants received information sheets describing the study and signed consent forms.

Students who consented to participate completed the "Beliefs About Assessment" questionnaire in February 2010 during their programme orientations. The same cohort was invited to complete the questionnaire again at the end of their second year (2011) and at the end of their third year (2012) just before graduation.

The statistical software package IBM SPSS Statistics Version 19 (2010) was used to analyse the Likert-type items. Before undertaking factor analyses of those items, the "don't know" option was recoded to "missing" to permit a meaningful scale of 4 points (low to high: strongly disagree, disagree, agree, and strongly agree).

The focus group and individual interviews with ITE student volunteers took place at the end of each year of their ITE programmes. Teacher educator conversations took place in October 2010 and at the end of 2012 at each of the four universities, each lasting approximately 90 minutes. The qualitative data from both the questionnaires and the conversations were transcribed and analysed inductively to identify themes within the data.

Results

Initial teacher education students graduate ready and able to begin using assessment to enhance children's learning

The "Beliefs About Assessment" questions provided a basis for examining shifts in ITE students' beliefs and understandings of assessment. For primary students, exploratory factor analyses were conducted. For the ECE cohort, which was too small to permit the same analyses, a comparison of student responses to questions between year 1 and year 3 was undertaken.

For the primary cohort, factor analysis of the 46 Likert-type items in the questionnaire at entry to the programme yielded three factors (accounting for 29% of the variance). The first factor, that assessment is relevant and serves many purposes, accounted for 15% of the variance and had 23 items loaded on it. The second factor (nine items, 9% of variance) focused on assessment having negative effects. The third factor (13 items, 5% of the variance) concerned broad range of classroom-based uses of assessment for learning by the teacher. Thus, entering ITE students had a broad, and as yet, largely unformed notion about the usefulness and relevance of assessment for many purposes, and only an emerging understanding of the use of assessment for learning as enacted by teachers. They were silent on children having any role in classroom assessment.

The primary ITE students demonstrated a more sophisticated and complex view of assessment at the end of their ITE. Five factors were identified. The first factor related to teachers and children both having roles in assessment for learning (14 items loaded on this factor, explaining 13% of the variance). The second factor related to the view that assessment is both useful and positive (13 items, 9% of variance). The third factor concerned beliefs that assessment has negative aspects (eight items, 6% of variance). The fourth factor centred on assessment as standards-based and summative (five items, 4% of variance) and the fifth factor concerned the importance of standardised over classroom assessments (five items, 4% of variance).

For ECE students, using a Bonferroni adjustment with $p < .001$, a statistically significant shift was found for three of the 46 Likert questions. Third-year ECE students were significantly more positive on two statements: "For good assessment teachers need to know their children well" (mean of 4.3 vs. mean of 5.0) and "children use feedback from assessments to improve their learning" (2.0 vs. 3.5). They were significantly more negative on the statement "standardised assessments are more useful than assessments developed at the ECE centre" (2.3 vs. 1.7).

Although both primary and ECE students entering ITE were able to identify appropriate professional expectations in response to Likert-type items, when they initially responded to the open-ended questions regarding why assessment is important and how it is carried out, a significant proportion responded from a student's (as opposed to a teacher's) perspective, and generally regarded assessment as tests or exam-like activities, associating these with negative experiences of and emotions toward assessment. By the time the participants were nearing graduation (2012), most answered the open-ended questions from the perspective of being a teacher, with fewer than 10% orienting their replies from a student perspective. They also gave more information in the open responses that included many different reasons assessment is important, as compared to their first set of responses in 2010. However, very few noted how children/learners can be active participants in their own assessment, which is a key element of assessment capability (Absolum et al., 2009; Ministry of Education, 2011).

Toward the end of the third year, when asked in the interviews how their beliefs and understandings about assessment had changed since they began their ITE, the following responses were typical:

> Oh, [now] it is not just scary testing and everything. There is a reason why teachers do testing. There are a lot of alternatives rather than just like a universal test, you can change it for each group level. You can adapt it to suit your class and what they need and at certain times of the day you are going to get different results. Everything affects the results and they might not be so valid and reliable really. You have to be really careful in planning your assessment.

> [Assessment] is actually talking to them. It is a lot about you really have to talk to them like, "Why did you write this? Why did you say that?" because yes they might get the answer, yes or no, right or wrong but it's really about why they put that and kind of assessing they comprehend it, that they actually understand it.

> [What has changed?] Negative to positive view, [why?] because we now see there are assessments which are stress-free and do not interrupt play.

Thus, by the end of their teacher education programme, this cohort of ITE students appears to have assumed an orientation of being teacher and shifted from thinking about assessment as a predominantly summative activity involving tests and exams. Furthermore, the primary ITE students now viewed assessment as including continuous, interactive, and teacher-led standards-based activities to promote next steps in learning. These shifts were evident in the interviews with third year ITE students in 2012.

> Now I have come to the understanding that it is a 'throughout' process. It is more than just a final conclusion on a piece of paper. It is how the kids have come through a process. It is understanding and informing your practice while you are going through it. So [assessment includes] the idea of changing what you were doing from your formative assessment, being able to change that based on what you know from the kids was a totally new concept to me. So just seeing assessment as that was totally, totally foreign at first but has been very helpful when it has taken me from not seeing it as a negative thing. But, whether that is because I am the one who is the assessor now instead of being assessed might have something to do with it because kids often have very negative connotations of tests.

Student comments also indicated that they were very aware that there was more to learn about assessment.

> I think when you look at assessment from the other side of the fence so to speak, on the teacher's side, it is just absolutely imperative. You only really know that when you are there. Now that I have finished my third practicum I know, and it has taken three years to get there and I've only been privy to a small bit of it but there is a massive world of assessment but I feel comfortable in it.

By graduation, ECE ITE students were more receptive to assessment as an activity that involved teachers, parents and children acting together:

> [we used to think] only teachers could be involved and set goals, [now] children and families are involved in setting goals, children self-reflect and verbal children can tell you what is going on, [it] involves peer assessment.

As these results briefly demonstrate, there was a change in the ITE students' beliefs toward a more positive attitude to assessment, and to recognising assessment as an interactive process involving the teacher and others. Asked what aspects of their ITE programme had been particularly helpful for their learning about assessment, participants responded that experiences within the university and while on practicum built both assessment knowledge and beliefs. By graduation, it appeared that most were ready and able to begin using assessment to enhance children's learning.

Considering assessment in primary school, there was much less evidence that ITE students knew how to use the standards-based assessment tools (such as asTTle, STAR, and so on) or that they were confident about supporting their future students to use and value assessment as a means of furthering their own learning. One student commented:

> [It would be helpful to learn more about] addressing those summative assessment tools that teachers use in a more practical way, like [how to] set up a maths test and give it to your tutor group. Like a STAR test, or a PROBE test or a GLoSS or something and just do it with your tutor group.

The ECE ITE students, however, noted the value and possibility of young children engaging in self- and peer-assessment.

Curriculum and policy contexts influence the assessment learning of ITE students and require attention in planning ITE curriculum and delivery

By the end of their ITE programme, the 2010 cohort of primary ITE students appeared to give greater prominence to some assessment policy messages than others. This was evident when comparing their responses to the "Beliefs About Assessment" items with those of the third year ITE students about to graduate in 2010. For the 2010 cohort, the importance of standardised assessments over classroom assessment emerged as a fifth factor on the "Beliefs About Assessment" questionnaire. This view was supported in interviews with these ITE students. For example:

> I also administered and marked a few school-wide asTTle writing assessments that they were doing which was just testing a new system that has come into place with those. I think new standards or something like that have come out so they were testing it across the school. I feel a lot more comfortable with e-asTTle now and Schonell, now that I know and have experienced it myself.

The introduction of national standards for primary-age children coincided with the 2010 cohort's beginning of teacher education. They learned about this policy in their university courses and experienced the effects of this policy during their practica in schools. This initiative included new standards for each year level in literacy and mathematics, and the requirement to make overall teacher judgements about each child's progress against the standards and for schools to report to parents and the Ministry of Education about achievement on these standards (Ministry of Education, 2009). Comments from the third-year ITE students in their interviews and in answers to the open-ended questions in the survey demonstrated how these learning experiences had shifted their knowledge and beliefs during ITE. For example:

> Just like with national standards, parents have got a right to know where their kid sits nationally but we need to explain and [provide the bigger picture of achievement]. It [national standards] is just such a tiny part of the picture. I was ignorant of that, totally ignorant before [undertaking teacher education].

There was, however, very little ITE student commentary about other current education policies. For example, primary ITE students made little mention of how they might use assessment to address the needs of poorly achieving groups of students or about assessing the key competencies of the New Zealand Curriculum (Ministry of Education, 2007), also mandated in 2010. They did, however, have strong views about the policy messages about assessment for learning.

The curriculum and policy contexts for ECE in New Zealand are unique, and the orientation of ECE ITE students to assessment differed from that of the primary ITE students because of this. Curriculum and policy shifts from the late 1990s resulted in the take up of sociocultural-oriented, ipsative, and formative assessment (Ministry of Education, 1996; 2004/2009a; 2009b). Narrative practices through learning stories dominate (e.g., Carr, 2001;

2009). These involve teachers, parents, children, and others in the documentation of significant everyday events in environments designed for learning that highlight children's learning identities in the contexts of dispositions for learning, working theories and/or dimensions of mana. The curriculum policy frames learning in the context of formal early childhood education not as the acquisition of isolated pieces of knowledge in combination with fragmented skills and capabilities, but as dispositions for learning, working theories and, in relation to the Māori text of *Te Whāriki*, dimensions of *mana* (Ministry of Education, 1996).

Early childhood education ITE students' transition from student to emerging professional (teacher) is reflected in their responses to what they saw teachers and children doing in assessment. At the beginning of their first year, ECE ITE 2010 cohort students clearly thought about assessment in relation to formal assessment tasks and the teachers' conducting these. Over a third of respondents to the open questions (37%) thought that during assessment activities, teachers would be observing or watching over an assessment, 11% clarifying task instructions, helping children decipher the task, or walking around the room supervising (a task), and 6% thought teachers would be watching for cheating. By the end of their ITE programme, ECE students were clearly conceptualising assessment as an activity that happens as a normal part of the every day, that assessment information is to be discussed (but whether that discussion is for clarifying interpretations, or clarifying/noting activity was unclear), and that children have a right to participate in discussions about their learning. Assessment was viewed as formative, ipsative, and sociocultural—all key elements reflecting current policy. However, there still remained an element of viewing assessment as being teacher-led observation and documentation of children's play.

The key findings from class-based group discussions by ECE ITE students about their current understandings about assessment, and how these differed from when they started their programme were particularly illuminating. They shifted to being readily able to use a range of assessment terms/concepts (e.g., formative, summative, self- and peer-assessment). They understood that the timing of feedback is important for learning and that assessment is essential to good teaching. They were conversant with ECE-specific concepts, such as assessment being through learning stories and involving multiple voices; that it is credit-oriented; and, that it involves noticing, recognising, responding, to children's learning. They recognised the importance of documenting children's learning and the value that has for families.

Initial teacher educator views

Teacher educators from all four universities endorsed the importance of assessment for learning in both 2010 and 2012. Their discussions scoped key features of current thought about assessment but there was very little discussion about the more technical aspects of assessment quality. The educators were aware of the tensions between theory, policies, and their own and school assessment practices. They reported that they faced challenges in accessing information to keep pace with change in policy and school settings, and adapting their programmes to meet emerging trends and needs.

On both occasions, the teacher educators highlighted the limited opportunities they have to participate in professional development associated with assessment reform. In 2010, the Graduating Teacher Standards (GTS), introduced in 2007, provided an example of the need for continued personal professional learning in assessment and the continual updating of course/paper learning outcomes and activities. Alongside this, they reflected that *every curriculum area seems to be evolving and changing* with these changes having implications for ITE student assessment knowledge and skills. In 2012, there was considerable discussion of philosophical, political, and practical dilemmas to do with the national standards. Their goal was for ITE students to develop a *positive professional* orientation towards continually learning more about the content they were teaching and the assessment tools they could use. They construed their ITE students and their own learning about assessment as a work in progress.

Capacity and capability building within the project

This project was designed as a multi-university collaboration with four co-principal investigators and a team of teacher educator researchers at each university—12 researchers in total. The team changed somewhat over the three years, but the original structure provided enough continuity and flexibility within the project to accommodate personnel changes, emerging researchers' involvement, and contextual challenges (for example, the earthquake sequence in Canterbury). Several research assistants built and shared expertise in data analysis and administration; teacher educator researchers were responsible for data gathering at their institutions; co-principal investigators crossed methodological boundaries to engage in mixed-methods analyses; and, it was possible to be able to address sector interests (primary and ECE) together and in parallel. Project involvement was a catalyst to two doctoral research studies.

The information collected during the 3 years of the project was continually shared with colleagues in the four universities and at NZARE with the intention of informing assessment curriculum development within ITE programmes. International presentations led to additional consortia focused on the development of ITE student assessment capability.

Recommendations

The results of this project suggest that it is important for teacher educators to take account of the assessment beliefs and knowledge of their students throughout their ITE. It is important to emphasize that even though the ITE students in the cohort of focus were in general well-prepared and ready to use assessment appropriately in primary and ECE settings, such readiness and confidence was not universal. By graduation, many were still less than confident and in need of support to use assessment for multiple purposes. This suggests that teacher educators need to know about the assessment beliefs and skill of individual ITE students, and use this information in supporting and developing assessment learning. This includes building awareness of and skill in the variety of assessment modes, and building understanding of validity, reliability, and task design in assessments. These results shed light on the need to support primary ITE students in making judgments against standards using authentic as well as standardised assessment tasks, and in engaging in productive moderation and professional learning conversations.

In both sectors it would be valuable to assist ITE students to engage in their own assessment and become more accountable for their own learning, and at the same time assist ITE students to learn more about how to help the children they teach to become assessment capable in these ways.

Greater liaison between universities and schools to consolidate beliefs and practices for an assessment for learning schooling environment would also be beneficial. Such liaison could provide more consistency for the ITE students moving between these two contexts as well professional learning and development opportunities to ensure continued assessment learning in the two years before full registration. We intend to follow some of our participants into their beginning teaching to understand how continued professional learning assists this development. Related to this, teacher educators would also benefit from professional learning and development in assessment.

Limitations of the project

This project investigated learning to be assessment capable from the ITE students' perspectives, and included some teacher educators' views about what ITE students should learn about assessment. Within the scope of this project, it was not possible to observe the ITE students exploring and using assessment nor was it possible to gain the perspectives of other contributors to their learning, such as those of associate teachers, principals

in the practicum schools, or lecturers beyond those teaching specifically about assessment. It would be informative to include those in those roles in future research, and to track some of the graduates from these programmes into their beginning teacher positions in schools and centres to understand how well prepared they find themselves to be to use assessment in these various contexts.

References

Absolum, M., Flockton, L., Hattie, J., Hipkins, R., & Reid, L. (2009). *Directions for assessment in New Zealand: Developing students' assessment capabilities*. Wellington, New Zealand: Retrieved from http://assessment.tki.org.nz/Assessment-in-the-classroom/Directions-for-assessment-in-New-Zealand-DANZ-report.

Brown, G. T. L. (2011). New Zealand prospective teacher conceptions of assessment and academic performance: Neither student nor practicing teacher. In R. Kahn, J. C. McDermott & A. Akimjak (Eds.), *Democratic access to education* (pp. 119–132). Los Angeles, CA: Antioch University Los Angeles, Department of Education.

Brown, G. T. L. (2004). Teachers' conceptions of assessment: Implications for policy and professional development. *Assessment in Education: Principles, Policy and Practice, 11*(3), 305–322.

Brown, G. T. L., & Hirschfield, G. (2007). Students conceptions of assessment and mathematics achievement: Evidence for the power of self regulation. *Australian Journal of Educational and Developmental Psychology, 7*, 63–74.

Brown, G. T. L., & Remesal, A. (2012). Prospective teachers' conceptions of assessment: A cross-cultural comparison. *The Spanish Journal of Psychology, 15*(1), 75–89.

Carr, M. (2001). *Assessment in early childhood settings: Learning stories*. London: Paul Chapman Publishing.

Carr, M. (2009). Kei tua o te pae: Assessing learning that reaches beyond the self and beyond the horizon. *Assessment Matters, 1*, 20–45.

Deluca, C., Searle, M., Shulha, L., & Klinger, D. (2009). *Developing a curriculum for assessment education*. Paper presented at the American Educational Research Association Annual Meeting, San Diego.

Graham, P. (2005). Classroom-based assessment: Changing knowledge and practice through preservice teacher education. *Teaching and Teacher Education, 21*(6), 607–621.

Hill, M. F., Cowie, B., Gilmore, A., & Smith, L. F. (2010). Preparing assessment-capable teachers: What should preservice teachers know and be able to do? *Assessment Matters, 2*, 43–64.

Hooker, T., Peters, S., Biggar, S., & Bleaken, F. (2008). *Training on the job: How do home-based co-ordinators support educators to notice, recognise, and respond?* Wellington: Teaching and Learning Research Initiative (TLRI).

Kane, R. G. (2005). Listening to students' voices: Self study of teacher education practice. In P. M. Denicolo & M. Kompf (Eds.), *Connecting policy and practice: Challenges for teaching and learning in schools and universities* (pp. 134–142). Amsterdam, Netherlands: Taylor & Francis Group.

Ministry of Education. (1996). *Te Whāriki. He whāriki mātauranga mō ngā mokopuna o Aotearoa: Early childhood curriculum.* Wellington: Learning Media.

Ministry of Education. (2004/2009a). *Kei tua o te pae, assessment for learning: Early childhood exemplars*. Wellington: Learning Media.

Ministry of Education. (2007). *The New Zealand curriculum*. Wellington: Learning Media.

Ministry of Education. (2009). *National standards*. Retrieved from http://www.minedu.govt.nz/theMinistry/Consultation/NationalStandards.aspx

Ministry of Education. (2009b). *Te whatu pokeka. Kaupapa Māori assessment for learning, early childhood exemplars*. Wellington: Learning Media.

Ministry of Education. (2011). *Ministry of Education position paper: Assessment (schooling sector)*. Wellington: Learning Media. Retrieved from http://www.minedu.govt.nz/theMinistry/PublicationsAndResources/AssessmentPositionPaper.aspx.

Popham, W. J. (2008). Assessment literacy for teachers: Faddish or fundamental? *Theory into Practice, 48*(1), 4.11.

Seigal, M. A., & Wissehr, C. (2009). *Assessment of all learners: Developing expertise in equitable assessment with preservice teachers*. Paper presented at the American Educational Research Association Annual Meeting, San Diego, CA.

Smith, L. F., Corkery, G., Buckley, J., & Calvert, A. (2012). Changes in secondary school preservice teachers' concerns about teaching in New Zealand. *Journal of Teacher Education, 64*, 60–74. doi: 10.1177/0022487112449019

Acknowledgements

Project team

University of Auckland research team

Associate Professor Mary Hill (co-principal investigator and overall team leader) Email: mf.hill@auckland.ac.nz
Dr Libby Limbrick
Dr Fiona Ell
Dr Lexie Grudnoff

University of Waikato research team

Professor Bronwen Cowie (co-principal investigator)
Beverley Cooper
Dr Bill Ussher

University of Canterbury research team

Associate Professor Alison Gilmore (co-principal investigator)
Dr Alex Gunn
Kaye Kara

University of Otago research team

Professor Lisa F. Smith (co-principal investigator)
Associate Professor Mary Simpson
Clare Church (until her retirement in April 2011)
Raylene Galvin (from April 2011)

Research assistants

Kelly Keach (quantitative research assistant)
Gayle Eyers (qualitative research assistant)
Hanna Gunn (qualitative research assistant)