

Linking **Research** to the Practice of **Education**

Linking Research to the Practice of Education is a publication of the School of Education (SoE), UNE, for all educators: early childhood, primary and secondary. It introduces research, conducted by SoE staff, applicable to the educational setting.

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Editorial

Welcome to the second issue of *Linking Research to Practice*, a UNE School of Education research newsletter for all educators. In this issue you will find four articles outlining research that may have applicability to your setting.

Marg Rogers discusses how she used creative arts to empower children and grant them opportunities to voice their ideas.

In the second article, Neil Taylor and Chris Fellows report on the ASELL project which has been providing opportunities for teachers and children to experience enquiry learning. While ASELL is due for completion in 2018, interested schools are welcome to contact Simone Pierce whose details are at the bottom of the article.

The third article by Sue Elliott and colleagues describes young children's experiences with Nature play and reports on children's perceptions of the play affordances of that environment.

The last article by Frances Quinn describes the experiences of rural and regional teachers who are teaching science and Math 'out of field'. Anyone interested in providing insights and information about their experiences relating to teaching out of field are welcome to contact Frances (contact details at the bottom of the article).

We hope that you find something interesting in this issue and would love to hear from you about how you perceive the newsletter. Issue 3 will come out in February, 2018.

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Empowering children through the creative arts: Is it possible to access the voice of 2-5 year olds?

Marg Rogers, UNE

Very young children often have a great deal to communicate about their experiences within their family, especially during times of transition such as when a parent works away. Expressing themselves fully can be impacted by language and cognitive development, thus increasing frustration. The creative arts can be a powerful medium for children to utilise, due to its ability to communicate a range of experiences and emotions. In this reported research with 2-5 year olds, children from Australian Defence Force (ADF) families were able to express their experiences and understandings of parental deployment using drawings, modelling clay, craft and photography after reading storybooks with characters experiencing a parent working away. This resulted in discussions with parents and educators, who commented on the positive difference the activities had on the children's ability to verbally express themselves about these issues. Importantly, the research activities gave a voice to these young children who had previously been marginalised in this type of research.

Empowering, supporting and listening to children's voices

The research revealed that it was both empowering and supportive for children to be heard in matters that affect them through various means, including creative arts responses. Since 1990, when Australia ratified the United Nations Convention on the Rights of the Child there has been an increase in participatory research into children's views about their world by listening to their often marginalised voices. Arundhati Roy reminds us of the importance

of empowering such voices, by stating "There's really no such thing as the 'voiceless'. There are only the deliberately silenced, or the preferably unheard". By giving children an opportunity to voice their experiences and understandings, we can empower children to have a voice (see Figure 1). I believe empowerment is a process of fortifying the confidence of groups and individuals to utilise their rights and to have more say (and take more responsibility) in their lives. This is not to say that children's voices are valued above adults, but that their voices are listened to when making decisions about matters that concern them.



Figure 1: Blake's (aged 5) clay model 'My face when my Dad goes away. The tears are blue' (Source: Rogers, 2017)

The importance of providing such opportunities

Children are dependent upon adults to 'provide the opportunities and support they need to participate in the decision-making processes which affect their lives'. A first step in harnessing children's opinions, experience and knowledge is by listening to their voices via activities that value their ability to express themselves in a variety of ways. Such activities can improve children's skills and confidence in expressing themselves, utilising the creative arts, and through discussions of their arts responses and those of their peers. In this research project, parents and educators commented that increased opportunities for children's verbal expression about

these matters decreased their reliance on challenging non-verbal behaviours such as clinginess, whining, tantrums and crying when they were missing their deployed parent (see Figure 2). Perhaps this improvement is partly attributable to the amazing vehicle the creative arts are for learning. Apart from skills gained in emotional and social expression, the creative arts provide multiple memory tags for children to store and retrieve information. The visual arts also provide an opportunity to make sense of their world through the creation of visual narratives, whereby children can add the fantastical elements to their understandings, defining reality in an active way.



Figure 2: Bethany's (4) drawing 'Waiting for Daddy at the airport' (Source: Rogers, 2017)

The practicalities of providing these opportunities

Opportunities to draw provide children with ways to construct meaning and represent aspects of their lives. Ensuring an adult is available to note down what the child is saying when they are drawing is also important, wherever possible. Separating the dual components of drawing and talking in young children is virtually impossible and the collaborative and communicative nature of drawing makes it a powerful meaning making tool. As educators, we can go beyond drawing to include opportunities for craft, musical composition (rap, rhyme and song), modelling clay and photographic opportunities

(where children take photos of objects and experiences that are meaningful to them). Artworks and photographs can be discussed with children, their educators and parents to gain further insights into their representations and to verify their meaning and intent. Rich and frequent creative arts opportunities create a sense of pride and confidence in children as they learn to express themselves about matters that interest them in ways they are confident with. Creative arts activities are time consuming, frequently messy and often easier with smaller groups or when extra adult helpers are available. However, this project has shown such opportunities are well worth the effort in voicing children's understandings and experiences.

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The Advancing Science by Enhancing Learning in the Laboratory (ASELL) Project

Prof Neil Taylor and Prof Chris Fellows, UNE

The University of New England (UNE) and specifically the School of Education (SoE) and the School of Science and Technology (SS&T), have for the past two years been major contributors to the Advancing Science & Engineering through Laboratory Learning (ASELL) Schools Project. ASELL Schools is one of a number of projects funded by the Office of the Chief Scientist through Australian Maths and Science Partnerships Program (AMSPP). This funding was provided in response to concerns that, across Australia, students in years 7-10 were becoming disengaged from science.

ASELL Schools is a national project that assists teachers to improve their scientific

investigations towards an inquiry-based approach in years 7-10 that would better address the Working Scientifically Processes of the 7-10 National Curriculum and prepare students for the new Senior Science curriculum. To achieve this ASELL Schools conducts one-day workshops that involve teachers and students from a number of schools working together on inquiry-based investigations. These investigations are discussed and refined based upon feedback and ultimately published on the ASELL Schools website to which all science teachers have access (<http://www.asell.org/Schools/Home>).

ASELL Schools involves five Universities. The University of Sydney is the lead and there are a series of node universities across five states and territories, (Adelaide University, Deakin University, Curtin University, Charles Darwin University and UNE). UNE is the node university for regional NSW and to date the UNE team has conducted over twenty workshops with schools in Armidale, Tamworth, Port Macquarie, Tweed5 (T5) community of schools and also Mirani near Mackay in Queensland. The team has also taken advantage of the Growing Regional and Agricultural students in science teacher Professional Development Day (GRASS TPD) at UNE to provide a shorter version of the workshop for the large number of science teachers who visit on that day.

The project has a significant research component and a great deal of data on the effectiveness of the workshops and individual investigative activities has been collected. This is gradually being published in research and teaching journals.

Members of the team, and particularly Katherine Harris from UNE Chemistry, also develop and adapt investigations for presentations at the

workshops. Katherine has developed two excellent activities on Water Purification and chemical reactivity, which are both engaging and well differentiated to cater for a wide range of abilities. Katherine has also been working with LEGO Education to develop an inquiry-based workshop involving robotics and coding.



Figure 1: Teachers collaborating in an ASELL workshop

The project has had a number of benefits for UNE and particularly the staff involved. It has helped to develop new relationships with a number of schools and science teachers. It has also strengthened links between the School of Education and the School of Science and Technology with more than a dozen staff from both schools having been involved in the workshops.

Ultimately the hope is that ASELL will have a positive impact on science classroom practice and in particular improve the quality and quantity of inquiry-based activities engaged with in secondary schools. If you are interested in hosting a workshop in your school, please contact Simone Pierce on spearce2@une.edu.au.

Investigating the potential of nature play with children

Dr Sue Elliott, Dr Subhashni Taylor, Dr Nadya Rizk, UNE
Dr Julie Kennelly, Matt Mc Kenzie, Thalgarrah Environmental Education Centre

Nature play has emerged as a global movement in the last decade. In Australia, this has inspired state government nature play initiatives, bush kinder and forest school programs and nature playgroups. However, as yet, Australian nature play research is somewhat limited and the potential for nature play in varied Australian settings is to be fully explored. In this study we investigated the potential of a new nature playspace for environmental education programs at Thalgarrah Environmental Education Centre (TEEC), Armidale, NSW. In particular, we focussed on young children's responses to the nature playspace and their perceptions of the play affordances. Our intent was to inform the ongoing development of the TEEC nature playspace and programs.

The potential of nature play

The benefits of nature play reported in international research include increased confidence, motivation and concentration, increased social, physical and language skills, deeper conceptual understandings and respect for the natural environment. More recently, Australian school playground research has confirmed the restorative impacts of green spaces promoting children's well-being and learning. Further, concerns about childhood obesity and overuse of screen-based technologies suggest 'the cure for the lifestyle maladies of contemporary childhood seems glaringly obvious and simple: outdoor play in nature'. Beyond

these direct benefits and concerns, we believe there is an urgency for all generations to experience nature play to avoid 'environmental generational amnesia'. Connections to the natural environment that sustains all, both human and non-human life, is fundamental to driving a global sustainability agenda. Drawing on these understandings, the Principal and staff of TEEC in collaboration with University of New England academics established this nature play research initiative.

Thalgarrah Environmental Education Centre and creating a nature playspace

TEEC is a NSW Department of Education facility located in grassy open woodlands on the Northern Tablelands. Students from Kindergarten to Year 12 participate in day visits or overnight camps and explore the NSW curriculum in all Key Learning Areas and cross-curriculum priorities especially 'sustainability'. While typically school-aged children attend, in recent years a local preschool group has visited instigating interest in developing play-based programs for 3-8 year olds.

Figure 1: Timber cubby frame to support construction with small branches



The recently created nature playspace is a rectangular woodland space of 1364m² and fenced on three sides, with a fourth side denoted by several timber poles. Since November 2016, changes have been implemented to facilitate nature play opportunities. For example, a ditch was dug to

create a shallow ephemeral water way with a log bridge, likely to afford sensory and symbolic play as well as physical skills. Further, a digging mound, bone pit, cubby frame, rope swing, climbing log, mud kitchen and a bamboo thicket were incorporated. Also, tanbark mulch was spread as needed to support active risk management by children and a standard departmental risk assessment was conducted by the TEEC principal.

Research focus

The study was informed by Gibson's theory of play affordance and a mosaic research methodology. Play affordance theory describes the unique relationship between an individual and his or her environment. With children it can be described as an invitation or provocation to play, such as a fallen log might invite balancing, a bushy thicket provoke hiding and a puddle invite the delights of splashing. Natural playspaces with green elements, loose parts and varied topographies communicate the highest play affordances for children. In this study we sought children's perceptions of these play affordances by employing a mosaic methodology that positions children as active researchers and incorporates multiple authentic ways of listening to children.

Figure 2: Log for practicing balancing, climbing and risk management skills



Children aged 3-8 years from a preschool and Y1/2 school group were invited to play in the nature playspace during weekly visits over six weeks. During the final two visits the children could participate in

audio-recorded child-pair-led 'walking interviews' when their ideas about the best place to play and why were shared with the researcher. They were also invited to photograph their best place using I pads. The photographs were later printed and employed as a provocation for children's focus group discussions at their preschool or school. These discussions were an opportunity to refine understandings and prioritise the best places in a small group setting.

While the children's voices were central to this study, the accompanying educators also completed a questionnaire about their interpretations of the nature play experiences and possible implications for their curriculum and educational settings.

At the time of writing, the research outlined above has just been completed and our next phase is to fully analyse the collated data. In a future edition of this newsletter we will share our research findings, however, anecdotally it appears the new nature play space has created positive impacts for children, educators and families alike.

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Teaching out of field in Maths and Science: The experiences of rural and regional teachers

Dr Frances Quinn, UNE

Teaching out of field (OOF) is common in Australia, particularly in rural and remote areas, so it is important to understand how it impacts teaching and learning and how schools can most effectively support OOF teachers. UNE researchers Frances Quinn and Rob Whannell, together with colleagues from Deakin University and the Queensland

University of Technology are investigating out-of-field mathematics and science teaching in rural and remote schools in NSW, Victoria and Queensland. Our three-year Australian Research Council study focuses on how teacher knowledge, practice and identity are inter-related and how they change as teachers adapt to new teaching roles within particular school environments.

We are nearing the end of our data collection, and though analysis is not yet complete, some preliminary messages from what OOF teachers and their leaders across these three states have told us are:

1. OOF teaching has been a positive and enjoyable experience for some teachers. They derived professional satisfaction from rising to the challenge and developing their knowledge of a new disciplinary area.
2. There were many substantial challenges that the OOF teachers had to overcome, for instance:
 - a. Additional workload related to learning to teach in the OOF area; specifically, planning, developing knowledge of content, quality resources and the syllabus;
 - b. How best to enact teaching plans and respond to student diversity and student questions in the new subject area;
 - c. Limited access to support people or professional learning in the new subject area, especially in small rural schools.
3. Where teachers perceived their OOF teaching experiences as negative, they reported having:
 - a. Undesirable changes in relationships with their colleagues and students;

- b. Some difficult events that impacted significantly on their identity, teaching or their class;
- c. Tensions surrounding their professional “value” or identities as a subject specialist versus a teacher more generally

Despite a few differences of opinions on these, the practices and systems that OOF teachers and leaders considered supported and enhanced OOF teaching included:

- School leaders providing teachers with an ongoing connection to their in-field area or their passions. Several teachers were motivated by a passionate commitment to their personal reasons for teaching, many of which related to their in-field subject area;
- Feedback and support from trusted and knowledgeable colleagues or mentors. A strong personal relationship was important here, which has implications for processes for allocating or choosing mentors;
- Teacher access to Professional Learning in their OOF area and high-quality resources from colleagues or networks;
- Some workload reduction for teachers taking on OOF classes, or involving them in decisions about their load;
- Allowing teachers time to develop in their OOF role by teaching a particular subject or year group multiple times;
- Trade-off for taking OOF areas, such as allocation to another desired class;
- Formal embedded support mechanisms, including provision of time for planning and for professional support and conversations with critical friends or mentors.

While not always the case, there is research suggesting that OOF teaching can have negative impacts on the wellbeing of teachers, especially those early in their careers for whom attrition rates are already of concern, and that OOF teaching can be linked to poorer learning outcomes for students. Therefore, supporting teachers taking on OOF responsibilities in mathematics and science is vital in Australia's current educational context.

Widespread concerns have been expressed about falling enrolments in higher senior mathematics subjects and physical sciences in Australia, as well as declining rankings in the PISA international comparison tests of secondary student performance in science and maths, and widening performance gaps between disadvantaged and advantaged students.

The incidence of OOF teaching in Australia is significant, with about 26% of Year 7-10 classes being taught by teachers teaching out of field. OOF

teaching is more common in rural or remote schools, and most teachers in this situation are early career teachers; for example, in 2013 about 21% of Year 7-10 Maths teachers were teaching out of field, 12% of whom had five years or less teaching experience (Weldon, 2016).

By talking and listening to these teachers and their leaders over time, we aim to inform the development of effective support structures in schools for OOF teachers, in order to help maintain a highly skilled and valued teaching workforce in science and mathematics in rural and regional schools. If you have any perspectives you would like to share, or any questions or comments on our research, you are welcome to contact Dr Frances Quinn. We would value your input.

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Interested in further study in education?

Do you want to return to study? Do you want to know more? The University of New England offers a wide variety of programs to assist teachers to upgrade their skills. Within many courses you can specialise in the area in which you are interested. Contact Associate Professor Sue Gregory, Course Coordinator on sue.gregory@une.edu.au for more information or visit some of the links below:

School of Education Postgraduate Study: <http://www.une.edu.au/about-une/academic-schools/school-of-education/future-students/postgraduate>

Graduate Certificate in Education Studies: <https://my.une.edu.au/courses/2017/courses/GCES/program-of-study-schedule-a.html>

Bachelor of Education (Early Childhood Teaching): <https://my.une.edu.au/courses/2017/courses/BEDEC1>

Bachelor of Education (Early Childhood and Primary): <https://my.une.edu.au/courses/2017/courses/BEDECP>

Master of Education: <https://my.une.edu.au/courses/2015/courses/MED>

Master of Education (Research): <https://my.une.edu.au/courses/courses/MEDR>

Doctor of Education: <https://my.une.edu.au/courses/2015/courses/EDD>

PhD: <https://my.une.edu.au/courses/2015/courses/PHD>