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.

Vol. 3, No. 1 (2019) ISSN: 2207-5151

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Editorial

Welcome to this issue of *Linking Research to the Practice of Education*, a UNE School of Education research newsletter for all educators.

Four articles are presented in this issue. First, Dr Myung-Sook Auh and Professor John Pegg present their findings from a longitudinal study investigating the effectiveness of video-conferencing as a medium for teaching 'Global connections' and 'Asian cultural awareness' in Australian classrooms.

In the second article, Dr Bing H. Ngu and Professor Huy P. Phan discuss their ongoing research findings regarding processes for optimising the learning of Mathematics. They illustrate how their emergent "Framework of Achievement Bests" can be utilized to support teaching and learning of mathematics.

In the third article, Dr Rachel Adlington builds on previous work that was featured in our February 2018 Newsletter regarding blog co-authorship and discusses one of the ways to achieve this. She further illustrates teachers' roles in supporting students' use of blogs in the classroom.

The last article is an invitation for participation in research by one of our Higher Degree Research (HDR) students, Vanessa Bartley-Heterick. Vanessa's research has direct implication to schools and you are encouraged to support her by completing the survey (link and QR codes available at the end of her article).

We hope that you find something interesting in this issue. The next issue will be published in August, 2019.

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CRICOS Provider Number: 00003G



Asia ConneXions: Teaching Global Connections and Asian Cultural Awareness by Asia Video Links.

Dr Myung-Sook Auh and Professor John Pegg, UNE

The Australian Curriculum requires students to develop intercultural understanding so that they value other cultures and recognize similarities and differences. The Curriculum also requires all students to learn about Asia through its cross-curriculum priority of 'Asia and Australia's Engagement with Asia' (https://www.australiancurriculum.edu.au/f-10curriculum/cross-curriculum-priorities/asia-andaustralia-s-engagement-with-asia/). Teaching 'Global connections', 'A diverse and connected world', and 'Study of a cultural group' are key topics in the NSW HSIE (Human Society and Its Environment) curriculum. Developing 'Global awareness' was identified as an essential skill among the 21st Century Skills Framework (https://www.imls.gov/assets/1/ AssetManager/Bishop%20 Pre-Con%202.pdf). The importance of global education was reiterated by UNESCO designating 'Global Citizenship Education' as a way to prepare students to meet future challenges (https://en.unesco.org/news/global-citizenshipeducation-preparing-learners-challenges-twenty-firstcentury-0). Therefore, teaching global awareness and cultural awareness of Asia are important curriculum goals for teachers. To help teachers to achieve these curriculum goals, the Asia ConneXions program is offered to Australian schools, and teachers integrate the Asia video links into their curriculum teaching. The effectiveness of the integration was researched, and this article reports some of the findings.

In the Asia ConneXions program, teachers have opportunities to design their class schedule and class content to suit their own schools through Teacher Meetings organized by the University of New England's (UNE) team. In the videoconferencing sessions, the Australian students taught their Asian peers about selected topics on Australia and also learned about Asian cultures from their Asian peers. The Asian countries involved were South Korea, Japan, China, and Indonesia, which are the priority countries in Asia selected by the Australian Government. In primary schools, teachers enthusiastic to teach about Asia participated, while in secondary schools it was either teachers of Social Studies (History, Geography, Commerce, Asian or International Studies) or those of Asian languages (Japanese, Chinese, Indonesian). The suitable grade levels were Years 4-6, 7-8, 9-10, and 11-12.

In our 5-year longitudinal research over 2013 to 2017, Australian teachers were asked if using videoconferencing was effective to achieve their curriculum goals and to elaborate their reasoning. The results showed that using videoconferencing was effective with a *Mean* score of 4.24 out of 5. The top ranked reason for being effective was 'Synchronous videoconferencing' (53%), and the second-ranked reason was 'Identifying similarities and differences in culture' (10%). The synchronous nature of videoconferencing was the greatest strength, thus making the use of videoconferencing highly relevant in teaching these curriculum topics.

Australian teacher comments on synchronous videoconferencing showed increased levels of student engagement: "Speaking directly to the students and receiving instant responses [was] far better than reading about it"; "The students liked being able to see and interact with students of a similar age in real-time";

Figure 1. Farrer Memorial Agricultural High School's video link with South Korea, 13 October, 2017. Retrieved from: https://www.walchanewsonline.com.au/story/4986995/local-school-students-speak-directly-to-south-korea/



"Learning content directly from Korean students living in Korea"; "Students are able to ask questions about things they don't readily understand"; "Practical /interactive sessions, e.g., learning a dance, bow, playing traditional games, tasting Korean snacks"; and "The ability to have instant verbal and visual contact with our partners". Teacher comments on identifying cultural differences and similarities suggested that students were encouraged to think critically comparing two cultures thus enabling deeper learning beyond simple absorption of Asian cultural information. The comments were: "Enabled students to draw comparisons and also understand differences between cultures through dual presentations"; "The opportunity for the students to hear how things may be done either similarly or differently in another country/culture"; and "Learning that students are very similar wherever they

are." Primary teachers commented on increasing confidence among children in their ability to speak confidently in front of others: "I had students who generally aren't confident when presenting, but through this experience, their confidence has developed."

Comments from Asian language teachers also indicated the benefits of Asian language learning: "Improve their speaking skills by speaking with and listening to native Japanese speakers"; "Encouraging students to use Japanese to communicate"; "An opportunity to improve fluency, hear correct and natural intonation and pronunciation and share cultural and linguistic information"; "They could hear authentic pronunciation"; and "An opportunity to hear and respond to naturally spoken language". One strong voice from Australian students was that the real-time video link with



Figure 2. A Korean primary school's videoconferencing session with a NSW primary school, October 2018

asian peers to communicate in Asian languages provided a reason for studying Asian languages.

Practical implications for teachers: 1) Using videoconferencing is effective for teaching the curriculum topics of global connections and Asian cultural awareness; and 2) The synchronous nature of videoconferencing enhances student engagement with Asian peers.

If your school is interested in connecting with South Korea this year, please contact Dr Myung-Sook Auh, Program Director of Asia ConneXions and Senior Lecturer in the School of Education: <u>mauh@une.edu.au</u> Tel: 02 6773 2917.

'Optimizing' Mathematics Learning: A Brief Note

*Dr Bing H. Ngu and Professor Huy P. Phan, UNE

Along with Professor Alex Yeung at ACU, we have been delving into students' learning experiences of mathematics and other academic subjects. We have considered theories of human motivation (e.g., Bandura's theory of self-efficacy), cognitive load imposition (from Sweller, Ayres, and Kalyuga), and positive psychology (see for example Seligman & Csikszentmihalyi, 2000; Seligman, Ernst et al., 2009), as well as existing pedagogical practices.

After working on several major research projects involving colleagues and students from Asian countries we developed a 'Framework of Achievement Bests' (e.g., Phan, Ngu, & Williams, 2016). The Framework of Achievement Bests, coupled with our Likert-scale diagnostic measures, explains the achievement of optimal functioning and the process of optimization – that is, how and why does a person achieve an optimal level of functioning in life (e.g. how do we assist a football player to score 50 goals in one season)? We suggest there are three comparable agencies in life that may optimize a person's internal state of flourishing and growth (e.g. the football player's predicament of his/her scoring): educational agents (e.g. an instructional design), psychological agents (e.g. personal belief of efficacy), and psychosocial agents (e.g. the school social milieu).

Our initial publications have led to empirical research involving the collection of experimental and non-experimental data situated in different learning and sociocultural contexts in China and Taiwan. One aspect of our study involved the examination of different instructional designs that could be 'optimizing' pedagogical agents for learning experiences. For example, in the context of learning how to solve linear equations, we find the inverse method is more 'efficient' than the balance method especially for complex linear equations that involve multiple solution steps. How does this conclusion come about? The transforming of our recent findings (Ngu et al., 2018) into educational practices for teachers is evident in Figures 1 and 2.

We use the notion of a relational line and an operational line to describe the solution process for linear equations. As shown in Figure 1, Line 1 and Line

3 are relational lines and indicate the interactions between elements, whereby the left side of the equation equals the right side. Line 2, in contrast, is an operational line because it involves the use of a mathematical operation to alter the state of the equation, yet at the same time maintaining its equality. The balance method and the inverse method differ in Line 2. The interaction between elements occurs on both sides of the equation for the balance method (i.e. -3 cancels + 3 on the left side of the equation, and -3interacts with 7 in the right side of the equation), but on one side only for the inverse method (i.e. -3 interacts with 7 in the right side of the equation). Therefore, the balance method imposes twice as many elements as the inverse method for each operational line.

From cognitive load theory, the higher the level of element interactivity in an instruction the higher the imposition of cognitive load to process. For simple linear equations involving one operational line and two relational lines (e.g. Figure 1), there is no difference in cognitive load between the balance method and the inverse method – given, in this case, the total level of element interactivity including Lines 1, 2, and 3 is relatively low.

However, for complex linear equations that involve more than one operational line and one relational line (e.g. Figure 2), the balance method would impose a higher cognitive load and is therefore less efficient than the inverse method.

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Balance me	ethod	Inverse meth	Inverse method			
Line 1	x + 3 = 7 (-3) on both sides	Line 1	x + 3 = 7 (+ 3 becomes - 3)			
Line 2	-3 -3	Line 2	x = 7 - 3			
Line 3	x = 4	Line 3	x = 4			

Figure 2: The balance and inverse methods to solve a complex linear equation. The inverse method allows the performance of two inverse operations concurrently (see Line 2).

Balanc	e method	Inverse method		
Line 1 Line 2	3x + 1 = 2x + 8 (- 2x) on both sides - 2x - 2x	Line 1	3x + 1 = 2x + 8	(+ 2x becomes – 2x; + 1 becomes – 1)
Line 3	x + 1 = 8	Line 2	3x - 2x = 8 - 1	,
Line 4	-1 -1 (-1) on both sides	Line 3	x = 7	
Line 5	x = 7			

Thus, in the Framework of Achievement Bests, the balance method is sub-optimal whereas the inverse method is optimal in terms of pedagogical practice for learning about complex linear equations. Moreover, the balance method is not likely to optimize effective mathematics learning (e.g. in terms of effort expenditure, personal resolve, etc.).

Our theory of human optimization is still evolving. We have recently, included an important theoretical component into the optimization of process namely, a person's experience of 'vitality', which we term personal energy (i.e., denoted as 'E'). From a methodological point of view, we have considered the importance of measurement and assessment of optimization – for example, how do we measure and assess the concept of 'energy'? We have also proposed an additional theoretical concept for consideration, namely, the 'index of optimization' (i.e., denoted as 'IO'), which reflects the totality of the process of optimization. Our research in this area is still ongoing as we search for improved ways to optimize mathematical learning.

*Bing H. Ngu and Huy P. Phan are co-authors of Teaching, Learning and Psychology (Oxford University Press)

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Blog co-authorship: Effective use of tags as organisers in classroom blogs

Dr Rachael Adlington, UNE

In the February 2018 edition of the School of Education Research Newsletter, I introduced the idea of blog co-authorship and three ways in which readers become blog co-authors. In this edition, I discuss the implications of my research, exploring one of the ways blog co-authorship occurs (by using tags as organisers of meaning), and how teachers may support students' use of tags as organisers in classroom blogs. I utilise the Australian Curriculum: English (Australian Curriculum Assessment and Reporting Authority (ACARA), 2015) and Systemic Functional Linguistics (Halliday & Matthiessen, 2014) as my frameworks for exploring how tags enact one particular type of meaning: textual or organisational meaning.

Blog authors use tags to make visible the blog's textual organisation and orient readers. For example, a blog may tag posts with the word 'recipes' or 'Christmas' to indicate the posts' content. Some posts are tagged with both. These tags, like website hyperlinks, allow readers to move between groups of similarly tagged, and thus organised, posts. By using tags, authors give readers a choice over which group of posts to read, and as such, readers become coauthors. The literacy knowledge needed to use tags in this way pertains to text cohesion, the focus of the Australian Curriculum: English Text cohesion substrand. In this, a cohesive device 'allows for prediction of how the text will unfold' (ACARA, 2015), and in the case of blogs, allows readers to choose how the text will unfold.

Blogs can be used in many ways in the classroom, including to share classroom activities with the outside world via a single, whole class blog or individual student blogs. Once established, tags can be added, and students' understandings developed regarding tags as organisers: textual, cohesive devices for readers.

Tag selection depends on the nature and purpose of the blog. To best employ tags as organisers, authors must consider the blog's size and composition and how readers might like the blog organised. Imagine a **whole class blog**, to share class news with parents and caregivers containing work of different students and across subject areas. Teachers and students must make decisions about what parent and caregiver readers might be interested in finding, e.g. posts about events, themes or topics, media such as photos or videos, or posts by particular children. These ideas then underpin organisationally useful tags: to indicate posts about events and themes ('camp', 'Christmas'); containing media ('photos', 'videos'); or, by children ('Amy B', 'Bodhi'). On the other hand, if students keep **individual blogs** to share learning, tagging posts with a student's first name is unnecessary, but using tags to organise by subject area ('maths', 'writing') or event is helpful.

Using multiple different tags across a blog reveals to readers the various themes by which the blog is organised. The tags also provide easy access for readers to themed groups of posts, and provides choice over which organisational pathway to follow. Will the reader read posts by a particular child, or about a particular event? However, consideration must be given to just how many different tags are desirable or useful. There is scant research about this, although my research showed enormous variety in how many tags young children use (Adlington, 2016). Further, the Australian Curriculum: English does not yet include learning outcomes or information that address teaching about or teaching with large and complex texts, like blogs, where using cohesive devices is more complicated. There is an excellent opportunity for further exploration of the effective use of tags and development of curriculum to match (Adlington 2019). In the meantime, when assisting blog authors to enhance their texts using tags, teachers should discuss, model and construct blogs considering the function of tags and how to employ them to best attend to reader needs.

In the next edition of the School of Education Research Newsletter, I will explore how blog authors and readers can co-author blogs through comments, and how comments might be a way to enact interpersonal meanings as part of school-based blogs.

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Invitation to all Australian registered teachers to Participate in Australia Wide On-Line Research Project

Vanessa Bartley-Heterick, doctoral candidate, UNE

The aim of my research, entitled *Gifted Education Conceptions and Support Survey* (GECaSS), is to explore registered Australian teachers' understanding and support of students who may be perceived as gifted within the context of the current Australian educational landscape. It is envisaged that the information gathered from the survey will assist in the development of recommendations for gifted education policy renewal with consideration toward an alignment of equitable practice across the country. Participation from registered Australian teachers will also support the quality of my Doctoral study. Research into the development and implementation of gifted education policies, when compared to other areas and fields of Education (e.g., student motivation), is relatively sparse (Casey & Koshy, 2012). Whilst the policies in gifted education can be seen as reflective of the growing knowledge in the field, research into the importance and implementation of policy development has so far been limited to secondary data sources (e.g., Brown, Avery, VanTassel-Baska, Worley II, & Stambaugh, 2006). These secondary sources of data do not provide accurate accounts of participants' (e.g., teachers) views and understanding of giftedness in Australian classrooms.

The empirical literature in Gifted Education Policy recognises a number of contentious issues relating to definitions of the terms 'gifted' and 'talented', not the least of which is that these definitions subsequently associate with the articulation, development, and implementation of strategies, programs, and/or policies (see for example Casey & Koshy, 2012; Phillipson, Phillipson, & Eyre, 2011). The current multitude of conceptions of 'giftedness' and 'talent' do not address the inherent issues that are associated with the implementation of gifted education policies themselves. These conceptions, as developed by numerous academics in the field of gifted education, have been mixed and have, more importantly, experienced significant transformations throughout the past 70 years (Borland, 2009).

All State and Territory Governments in Australia and many Catholic and Independent schools, currently have in place 'Gifted and Talented Education' Policies or Frameworks focused on the identification and subsequent educational adaptions for recognised gifted students. Consideration of Australian teacher understandings of giftedness and their level of support of gifted education practices will provide a valuable contribution in targeted recommendations for policy renewal.

The GECaSS (Gifted Education Conception and Support Survey) forms a large part of this research project. It is directed toward all **Australian registered teachers**. Of note, there is no requirement for teachers to have any specialist knowledge of giftedness or gifted students in order to undertake the survey. The survey will take between 25 to 30 minutes to complete and the input of Australian registered teachers will help to support equitable education for all Australian students.

This project has been approved by the Human Research Ethics Committee of the University of New England (Approval No. HE18-009, Valid to 01/07/2019).

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Should you elect to participate, please find further participant Information and Implied Consent Information at the beginning of the survey itself. Alternatively, you can contact me on <u>gecass@une.edu.au</u> or on 02 6773 4221.

Anonymous Survey Link and QR Code:

https://unesurveys.au1.qualtrics.com/jfe/form/SV_3vHu XIzG4Z2UNJX



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