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Guest Editorial
Talking and Understanding Technology in the Primary setting

Wendy Fox Turnbull, Waikato University, New Zealand
Swathi RR, Waikato University, New Zealand

In recent years technology education has taken a backward seat in primary schools as governments push for evidence that money spent on education is making a difference. Rightly or wrongly, the measure of such difference was equated to skills and abilities in the areas of literacy and numeracy. Unsurprisingly to many the results of such initiatives have been underwhelming to say the least. Those in the fields of technology, science, social sciences have always advocated for an interdisciplinary approach to integration in which these subject or learning areas become the catalyst for the development of literacy and numeracy skills in authentic, student-centred contexts, along with a range of other skills necessary to flourish in a current and future world.

We therefore believe that the time is right to offer a special featured section of Design and Technology Education: An International Journal, devoted to technology education in primary schools. Two broad themes emerge across the six articles in this special section. The first is classroom talk and the role it has in students' learning in technology and understanding that learning from teachers' perspective'. The second is related to cultural norms and behaviours, namely gender and indigenous cultural technologies.

Classroom talk, oral language and explanation link thee articles in this edition. In their article Swathi RR, Wendy Fox-Turnbull, Kerry Earl-Rinehart and Nigel Calder (Waikato University, New Zealand) report on research undertaken on the development of a tool to assist teachers' teaching skills and knowledge and their understanding of technology education. The value of classroom interaction is at the core of this article. It reports on the continued development of the Technology Observations and Conversation framework originally develop to assist teachers' understanding of technology learning for young students aged between four and six years of age. In the research reported in this article, this framework was modified to suit the New Zealand context and to be more effective for students nine to ten years of age. The iterative nature of the process used to modify the framework was teacher informed. The study illustrates how having specific questions to ask their students assisted teachers' thinking in technology. An especially concerning issue highlighted in the article is teachers' lack of understanding and experiences teaching technology.

In their article, Hanno van Keulen and Conny Boendermaker (Windesheim University of Applied Science, The Netherlands) also focus on communication, language development through science inquiry and technology design and make approaches. This article too has a focus on student oral language with an emphasis of offering a science and technology context to engage the students in quality talk. This same context was also used to motivate reading with topic related age-appropriate books with the aim of improving reading levels, thus illustrating the

point made in the introductory paragraph about the value of technology as a "vehicle" for learning in other learning areas. Integration and authenticity are at the heart of this article. During the study teachers improved their asking of questions and their ability to facilitate conversation as well as giving students context related reading. This study concludes that successful teachers still need considerable encouragement and a Professional Learning Community (PLC) to manage the perceived risk of change - movement away from structured textbook related reading tasks to reading tasks in authentic contexts related to the student's inquiry into the natural and technological world.

The article by David Mioduser and Asi Kuperman (Tel Aviv University, Israel) is a standout article for its investigation into how very young children (5-8 year olds) explain behaviour of robots. Again, we see the oral language plays in this process. This research investigates three groups of children who are taught to either programme a robot doing various tasks, or observe such robots and explain their behaviour. The research offers fascinating insight into how children explain robots' behaviours as scripts, episodes, or rules. The children who programmed the robots tended to think of the robot's behaviour in terms of rules. This finding offers concrete evidence that introducing programming in kindergarten curriculum could be advantageous to children.

The second broad theme in this journal related to cultural norms. In their article, Milorad Cerovac, Kurt Seemann and Therese Keane (Swinburne University of Technology, Australia) report on a pilot study on spatial reasoning in primary school students, finding difference related to gender when working in a group. The role of gender is discussed as being important when examining key cognitive functions such as spatial inferential reasoning. During the study reported in this article, the young participants recognised gender-related stereotypes. This raises implications for teachers. How are gender stereotypes avoided at the primary level, especially in light of the under-representation of women in technology? This study also provides some understanding of gender differences in collaborative group work in technology. Girls collaborated more than the boys and tended to remain on task and less distracted than the boys. This article also highlights self-esteem issues students face when given a complicated task where they "fail". These findings will be further developed in a larger study that is planned for the future. The initial findings, though, highlight emerging understanding and need for further research in spatial reasoning especially in relation to gendered differences.

Gender is still the main theme in an article from Ulrika Sultan, Cecilia Axell and Jonas Hallström (Linköping University, Sweden), which contradicts Cerovac, Seemann & Keane's findings about girls leading collaborative tasks. They instead identify girls' reluctance to engage in technology. Examining self-image of 9-12 year old girls, the research reported in this article found that girls did not lead the task in mixed-gender groups. This paper additionally deals with girls' identity in relation to technology and provides insight into possible reasons girls lose interest in technology as they grow older. This article suggests that despite the teacher introducing gender-neutral activities as suggested in previous research, the girls in the study were conflicted about their self-image as technologists. They approached boys for help with "technical" tools and did not seem to recognise the tools they were skilled at using as "technology". It is also interesting to note that girls seem to accept the stereotypes associated with technology and females and also in some sense promoted the stereotype actively in the

classroom by feeling and acting helpless in their choice of tools and level of engagement with the tasks.

In technology cultural-related stereotypical ideas are not limited to gender, but also include ideas about indigenous technologies. In her article Cecilia Axell (Linköping University, Sweden) presents a case study carried out in a Sámi school in Sweden. Sámi are indigenous to Sweden. The aim of the study was to understand the use of indigenous artefacts in technology teaching. The paper describes three very interesting lessons taught in a classroom with eight and nine year old children related to three indigenous technologies. Learning about the indigenous artefacts helped create a link between past and present and deepen technological knowledge by presenting the artefacts as a solution to problems faced by the Sámi people using the existing resources. Indigenous technology also have a role to play as symbolic artefact contextualised through myths and storytelling. This paper offers interesting ways in which indigenous knowledge can be incorporated into technology lessons in authentic and meaningful ways thus distilling stereotypical views of indigenous technologies.

In conclusion, it is interesting to note the comment in Axell's article about the relationship between indigenous technologies and their contextualisation through myths and storytelling. We complete the circle and return to the power of oral language in technology. Oral language enables a voice to students who have trouble writing and drawing their ideas. It is a valuable tool for teachers to engage with, challenge, learn about and from their students and finally it gives life and voice to technologies from indigenous cultures with strong oral traditions.