Dialogue, New Media and Children's Intellectual Development: Re-thinking Malaysian Teaching and Learning Approaches

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ABSTRACT

This thesis examines the extent to which 'Talk or Dialogue' contributes to children's cognitive and psychological development when it is experienced through technological devices. The work analyzes some of the sociocultural theories of children's speech, cognitive learning, psychological functions, sociocultural learning context, dialogic teaching and learning approaches in the classroom, social interaction and the use of social tools. The theory of speech is built on the Vygotskian notion of language as the prime cultural and psychological tool for children's learning development in a sociocultural environment. Lev S. Vygotsky emphasised that the development of cognitive processes in children includes thinking, reasoning and understanding of a conceptualised social interaction. These processes are core to children's intellectual learning. Vygotsky and the neo-Vygotskians emphasised the use of Speech, Talk or Dialogue and the Zone of Proximal Development (ZPD) concept in children's learning development. In the UK, it was evident that the Talk teaching and learning approach (Mercer & Littleton, 2007) contributed effectively to children's learning achievements. This approach reinforces Talk or Dialogue collaboratively in the classroom with the ZPD concept. The significance of the Talk teaching approach has encouraged this study to examine further children's speech and the use of technological devices. Hence, a theoretical discourse methodology on children's Talk or Dialogue was examined for the research outcomes. The aim is to devise a new teaching and learning approach that contributes to the Malaysian children's intellectual development inside and outside the classroom through the use of Talk or Dialogue. As a result, a Dialogic framework is articulated based on four existing educational theories of children's speech and learning. This framework is vital to contribute directly to the *Malaysia Education Department Blueprint 2013-2025* in promoting children's intellectual development. For that reason, two approaches are proposed which emphasise children's psychological functions of perception, attention, sensory motor-operations and memory through the use of Talk and technological devices. These approaches accentuate the ZPD concept between the teachers and children for learning and activity games. This is the study's contribution to new knowledge.

Table of Content

Figures

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Introduction

Introduction

British – Malaysian educational context

Malaysia has been governed by the British colonial government since 1891. In August 1957, Malaya became fully independent and Malaysia was established in 1963. Since then, Malaysia has been a member state of the Commonwealth of Nations. The British set up many prestigious secular schools during this period which remain in operation until today. British colonization initiated English-medium schools that provided secondary education to locals in urban areas. They established colleges and the Malayan education system, which produced many of Malaya's intellectuals. Many teachers have been educated, and they in turn aim to educate more Malays. The schools include the Penang Free Schools, Malacca High School, Sultan Idris Training College and Malay College Kuala Kangsar. Richard O. Winstedt and Richard James Wilkinson are British intellectuals who worked together with locals Malays, as well as Chinese and Indian intellectuals from the Malay, Chinese and Tamil multi ethnic schools, improving local education. The education system, was reorganised a decade before the end of British rule in accordance with the Barnes Report of 1951[1]. The Barnes Report recommended a national school system in Malaya that would provide primary education for 6 years with the basic requirement that the Malay language be treated as the principal language. Students who attended such schools obtained technical and trade skills. Many locals went on to pursue the Cambridge Senior School Certificate examination[2].

In 1996, the Malaysian government reformed education when it published the Private Higher Education Institution Act[3] which re-examined education philosophy and development. The reforms concentrating on higher and tertiary education, and implemented the establishment of private tertiary institutions which focussed on the provision of science and technology related courses. The Act enabled the private sector to establish degree-granting institutions and foreign universities to set up branch campuses in the country. Similarly, the Universities and University

[1] Pelan Induk Pembangunan Pendidikan. Ministry of Education of Malaysia. P. 17.
[2] http://www.teo-education.com/teophotos/albums/userpics/053_Early_Education_in_Malaysia.pdf
[3] Government of Malaysia. 1996. *Seventh Malaysia Plan 1996-2000.* Kuala Lumpur: Government Printers.

Colleges Act 1996 enabled public institutions of higher learning to be corporatized by foreign universities. An increasing number of partnerships, particularly from Great Britain, the United States, Australia and New Zealand, have ventured into educational collaborations with locally established colleges. These countries offer twinning programs, credit transfers, validation and accreditation, distance learning and open university programs. The establishment of branch campuses of foreign universities such as Monash University, Nottingham University and Curtin University of Technology provide other options to obtain foreign tertiary qualifications locally. The Ministry of Education (MOE) continues to found close relationships in education and learning by allocating local students for higher education degrees in Britain, France, Germany, The Netherlands, Ireland, and elsewhere.

The aim of this study

Malaysia is looking forward to a new generation of children that are educated, confident and able to think critically. These qualities embody the vision and goal that the Malaysian government is hoping to achieve between 2015 and 2025[4]. In-line with this vision, this thesis aims to re-conceptualize the current methods of Malaysian teaching and learning into a new approach, with the use of children's speech, using 'Talk or Dialogue' with teachers' guidance and integration with new technological devices. The approach draws on the notion of speech and the ZPD (Zone of Proximal Development) concept between adults, teachers or parents, and children. The objective of this study is to provide a platform for children to acquire specific skills as indicated above. Studies have proven that the use of Talk between children and teachers and other adults, contributes substantially to the development of cognitive thinking[5] (Edwards and Mercer, 1987; Mercer and Littleton, 2007; Laurillard, 2002; Alexander, 1998). According to Mercer and Littleton (2007) the ZPD is an integral part of an interactive theory of cognitive development, a process of joint activity for children and parents at home, or teachers

[4] Ministry of Education. 2012. *Preliminary Report, Executive Summary, Malaysia Education Blueprint*, 2013-2025. Kuala Lumpur: Government Printers.
[5] Edwards, D. and Mercer, N., 1987. *Common knowledge: The development of understanding in the classroom*, London: Methuan/Routledge. Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children Thinking, A Sociocultural approach*, Abingdon, Oxon, Routledge.

in the classroom[6]. The ZPD concept puts emphasis on the construction of knowledge and understanding between adults, be it teachers or parents, with children, through Talk (Vygotsky, 1930; Cole, et al., 1978)[7].

The Research Questions

This study has two research questions. Firstly, to what extent does 'Dialogue' contribute to children's cognitive development when experienced through interactive technological devices? Secondly, to what extent do existing theories of Dialogue or Talk and interaction enable us to understand the shaping of children's intellectual development?

[6] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children's Thinking, a Sociocultural Approach*, Taylor & Francis Group, Routledge, London and New York. pp. 13-15.
[7] Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., 1978. *Vygotsky, L.S. Mind in Society: the development of higher psychological processes*, Cambridge MA: Harvard University Press; London, England.

Overview

Dialogue, or Talk and learning

Dialogue is defined as the communicative acts which include conversation, talk, communication, interchange, discourse, argument, chat, gossip, colloquy, as well as discussion, debate, exchange of views, head-to-head, consultation, conferences, meetings, interviews, question and answer sessions and negotiations (Wells, 1999) [8]. Dialogue or Talk is carefully chosen as a learning method. In this study, a distinction is made between Dialogue or Talk amongst children and teacher, children and children and children and their parents. Hence, Dialogue or Talk is to be recognised and recommended as a new way of understanding and helping children in their learning development. Talk represents more than just 'talk' or a conversation between a teacher and a learner, but a way of knowing and developing the bonding of an adult and a child, or parents and children. In this thesis, Talk is the appreciation, interaction and knowledge privileges specially targeted to teach and nurture children's learning achievements. The approach of teaching and learning in this study uses Dialogue or Talk as two ways of mutually developing a relationship between one person and another. Dialogue is a connection of a person and another 'self',[9] the other is a person and a responsive machine such as a computer, a computer tablet, an iPhone (that is basically with an interactive object), or the process of interaction with technological devices. Hence, both Dialogue and Talk in this study signify a methodology for teaching and establishing a style of collaborative learning for children to progress, in a team, to achieve learning goals. The goals of learning are hoped to be achieved mutually by the teacher and the learner with the aid of technological devices that incorporate the use of Dialogue or Talk together. A range of subjects such as philosophy, logic, rhetoric and mathematics have used Dialogue (Alro & Skovsmose, 2002). A negotiation in

[8] Wells, G., 1999. *Dialogic Inquiry: Toward a Sociocultural Practice and Theory of Education,* Cambridge University Press, Cambridge, UK.

[9] E.g. an internal monologue both spoken and heard inside.

Dialogue represents the verbal interactions between two or more parties in discussing social or personal related endeavours.

This thesis explores the development of children's cognition and psychology through the use of Dialogue with Interactive technological devices. Children in this thesis represent boys and girls aged 10–15-years-old. Jean Piaget (1959) named these ages as the Concrete and Formal Operational stages. The Concrete Operational stage is between seven to eleven years old. At these ages, Piaget claims that children are fully concrete in their thinking and begin to think logically and to converse with the help of practical aids. The formal operational stage is from age eleven to sixteen. Piaget contends that between these ages these children can easily converse, think logically and develop abstract reasoning and thought. They are also able to think abstractly and make rational judgments about observable phenomena, which in the past they needed to manipulate physically to understand[10]. When teaching children, giving them the opportunity to ask questions and to explain things back allows them to mentally manipulate information in the process of dialogue.

Dialogue and learning

Paulo Reglus Neves Freire, (1970) a Brazilian educator and influential theorist of critical pedagogy, emphasises the importance of Dialogic action [11]. Freire was known for developing popular education that gives emphasis to dialogue as a type of pedagogy[12]. Freire argued that dialogue is a means of democratizing education, typified by respect and equality that allows students and teachers to learn from one another. He stresses the use of Dialogue to the oppressed people with their performance or application of skills. He claims that human nature is Dialogic and communication plays a leading role in people's lives[13]. Thus, Dialogue is valuable for educators and learners and the goal is to deliver and receive knowledge when interacting with each other. More importantly, this thesis contends that, Dialogue here is in line

[10] Piaget, J., 1959. *The Language and Thought of the Child,* 3rd edition: pp. 1-28, London: Routledge & Kegan Paul Ltd.
[11] Freire, P., 1997. *Pedagogy of the Heart.* New York: Continuum (O.V. 1995).
[12] Freire, P., 1970. *Pedagogy of the Oppressed.* New York: Continuum Books.
[13] Freire, P., 2007. *Pedagogy of the Heart.* Copyright@1997 by Anna Maria Araujo Freire, The Continuum International Publishing Group Inc.

with Freire's argument about 'others' – that we continually create and recreate ourselves with technological devices. This means that Dialogue must be built in a scholarly condition that encourages epistemological curiosity in order to promote free and critical learning.

The Russian literary critic and semiotician Mikhail M. Bakhtin, (1981) highlights the notion of Dialogic imagination in promoting dialogue and learning. He has theorised dialogue in emphasizing the power of discourse to increase understanding of multiple perspectives and create myriad possibilities (Tullio, 1990) [14]. Bakhtin argued that dialogue creates a new understanding of a situation that demands change as relationships and connections exist among all living beings [15]. His concept of dialogism states a relation between language, interaction and social transformation. Michael Holquist, (1990) described Bakhtin's writings as profound and as representing a substantive shift from prevailing views on the nature of language and knowledge [16]. Bakhtin maintains that there is a need to create meanings in a Dialogic way with other people [17]. He claims that the individual does not exist outside dialogue. Like Freire, Bakhtin claims that the concept of dialogue itself establishes the existence of the "other" person. It is through dialogue that the "other" cannot be silenced or excluded because there are two parties involved. Bakhtin argues that meanings are created in the processes of reflection between people. That said, dialogue cannot be separated from the perspectives of others. Learning derives from individual speech during conversation and argument. Bakhtin asserts that talk is a chain of dialogues, every dialogue results from a previous dialogue and at the same time, every new dialogue will be presented in future dialogues. The Dialogue or Talk in this thesis is about the chain between teacher, children and the use of Interactive technological devices that relate deeply to one's life. Dialogue presents one's cognitive and psychological development that continuously learns.

[14] Maranhão, T., 1990. *The Interpretation of Dialogue*, pp.197, USA: University of Chicago Press.
[15] Bakhtin, M., 1981. *Discourse in the novel* (M. Holquist & C. Emerson, Trans.). In M. Holquist (Ed.), *The Dialogic Imagination*, pp. 259-422. Austin: University of Texas Press. Bakhtin, M., 1984. *Problems of Dostoevsky's poetics*, Minneapolis, MN: University of Minnesota Press, pp. 312. *Computer Support for Collaborative Learning*, 1999. Bakhtin, M., 1986. *The Problem of Speech Genres* (V. McGee, Trans.). In C. Emerson & M. Holquist (Eds.), *Speech Genres and Other Late Essays*, pp. 60-102, Austin: Univ. of Texas Press.
[16] Holquist, M., 1990. *Dialogism: Bakhtin and His World*, London: Routledge.
[17] Bakhtin, M., 1981. *The Dialogic Imagination: Four Essays*, Austin: University of Texas Press.

Synopsis

Chapter 1 - The Literature Review

This chapter highlights the work and contributions of many sociocultural behaviourists, psychologists and educationists in children's learning development and classroom teaching and learning, namely: Lev S. Vygotsky, Jean Piaget, Jerome Bruner, Robin Alexander, Neil Mercer, Karen Littleton, Diana Laurillard, David Perkins and Gavriel Salomon to whom an understanding of the importance of Dialogue was vital for children's intellectual development. In section I, the work of Mercer and Littleton (2007) on classrooms Talk or Dialogue and the development of children's thinking through a sociocultural approach is analyzed. Mercer and Littleton underlined a Dialogic teaching and learning method called 'Thinking Together' used in the UK's classrooms[18]. They referred to both terms "Talk" or "Dialogue" in emphasizing how Talk or Dialogue can be used in the classrooms to create a collaborative learning environment. Mercer and Littleton claim that Dialogue and Development invoke the idea of children's cognitive growth that helps them develop and become intellectual individuals within society [19]. With teachers' help, children will understand the process of interaction [20]. Drawing upon Mercer and Littleton's work, this thesis builds a strong foundation for analyzing the implementation of Dialogue in the Malaysian classroom.

Section II examines the sociocultural theory of learning. Bruner (1996), a child developmental theorist and psychologist reveals how Dialogue and pedagogy guide children into their culture. Learners need to further their own cognitive efforts to obtain new knowledge of what has been referred to and known before [21]. Bruner applied cultural psychology to education to urge learners' participation in cultural activities in order to achieve the full potential of intellectual learning. Hence, Bruner's idea of Dialogue and pedagogy are important as the basis of understanding Dialogue teaching for children. With this work in mind, this thesis

[18] Mercer, N., 2008. The Seeds of Time: Why Classroom Dialogue Needs a Temporal Analysis. *Journal of the Learning Sciences, 17, (1):* pp. 33-59.
[19] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children Thinking, A Sociocultural approach*, Abingdon, Oxon: Routledge.
[20] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children Thinking, A Sociocultural approach*, Abingdon, Oxon: Routledge.
[21] Bruner, J. S., 1996. *The Culture of Education*, pp. 56-60, Cambridge MA: Harvard University Press.

goes on to examine Alexander's (2004) research on children's Talk in the classroom as the prominent element for effective thinking and learning. Alexander highlights the engagement of teachers and children through Talk in the classroom [22]. Alexander emphasises the scaffolding concept which highlights the interaction between teachers and children in nurturing the development of children's very identity and sense of self-worth[23]. Freire, Bakhtin, Alexander, Wood, Bruner, Ross and Mercer's contributions are each derived from the notions of the 'Zone of Proximal Development' (ZPD) a concept by Vygotsky (1962)[24]. Vygotsky 1894-1934 was recognised as a pioneer in Russian Developmental Psychology. He contributed greatly to an understanding of educational psychological development for children and learning. His works are significant to scholars in information processing and technology today[25]. Vygotsky's interests which include psychology, children's learning, thought and language, thought and speech, the higher psychological functions, the use of social tools and cognitive learning development are substantial subjects in this thesis. These subjects are important in examining children's higher psychological functions of speech, perception, attention, sensory motor-operations, memory, the social tools, the sign-operations activity which relate to Talk or Dialogue. In section III, a detailed analysis is given of the higher psychological functions of humans and the ZPD, Vygotsky's experimental methods and how they are significant in understanding children's cognitive development [26]. These topics are pertinent in understanding the ZPD concepts of learning, social interactions and adult guidance for children's intellectual development. In section IV, more of Vygotsky's work on the role of speech and the children's use of social tools are analyzed in detail to formulate the relation between children's Talk or Dialogue and intellectual learning development. This includes analyses of children's interpersonal and intrapersonal psychological development through social settings.

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[22] Alexander, R. J., 2001. *Culture and Pedagogy: International Comparisons in Primary Education,* Blackwell, pp. 391-528.
[23] Alexander, R. J., 2008. *Towards Dialogic Teaching – Rethinking Classroom Talk,* 4th edition: pp.11, York: Dialogos.
[24] Vygotsky, L. S., 1962. *Thought and Language,* Cambridge, MA: MIT Press.
[25] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children Thinking, A Sociocultural approach*, Abingdon, Oxon: Routledge.
[26] Cole, M., John-Steiner, V., Scribner, S., and Souberman, E., 1978. *L. S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press; London, England.

Consequently, to understand the development of Talk or Dialogue, teaching and learning in the classrooms, section V analyses the Dialogic teaching and learning approach with technological devices that has been developed by Diana Laurillard within the 'Conversational Framework'. Also, the work of many other scholars including Peter Duffy, Axel Bruns, Paul Ramsden, Gordon Pask, John Seely Brown, Allan Collins, Paul Duguid and Roger Saljo were examined. Their works were selected to understand the relationship of Dialogue, teaching and learning. Laurillard emphasised the use of media technology teaching and learning approaches and how the teacher provides the true value of conversation and teaching. She underpinned a 'Conversational Framework' for a higher level of teaching and learning approach which provides a pathway for this thesis in analyzing children's Talk or Dialogue with the technological devices. Lastly, in the conclusion, section V invites readers to understand the digital culture of the 21st century and its application in the classroom.

Chapter 2 – Interaction Through Dialogue

This chapter examines Vygotsky's theory of the dynamics of human psychological functions which include perception, attention, sensory-motor operations and memory. Hence, a methodology of theoretical discourse was used in examining the research questions. Namely: to what extent does 'Dialogue' contribute to children's cognitive development when experienced through Interactive technological devices? Secondly, to what extent do existing theories of Dialogue and interaction enable us to understand the shaping of children's intellectual development? This chapter examines the ZPD, the child's logic theory, Dialogic teaching and learning approach, children's higher psychological functions of perception, attention, sensory-motor operations, memory, play and social interaction. Section 1 scrutinises the theory of children's speech by Piaget in the 1920s. Piaget termed children's speech as Egocentric - The Child Logic Theory [27]. This section analyzes children's speech, social interaction and its relation to the sociocultural context of Interactive technological devices. Section II highlights the 'Exploratory Talk' and the 'Thinking Together' approaches of teaching and learning in

[27] Piaget, J., 1959. *The Language and Thought of the Child*, 3rd Edition, London: Routledge and Kegan Paul Ltd.

order to scrutinise the use of Dialogue and the sociocultural approach to learning in the classroom. Section III examines the development of children's psychological functions; perception, attention, speech building and many more by Vygotsky. These psychological functions relate significantly to children's behaviour. Section IV examines the functions of memory and thinking in children's development relating to sign-using activity [28]. (Cole, et al., 1978, pp.38-49) Section V argues about speech, play, as well as the scholars' arguments on scaffolding, distributed cognition and shared knowledge to underpin the research questions. In conclusion, high levels of engagement can in turn affect the cognitive distribution of speech, social interaction, ZPD, shared knowledge, play and educational achievements in children. Their attention, inquisitiveness and reflection are developed in this context.

Chapter 3 - The Case Studies

In this chapter, two case studies have been analyzed as regards to Dialogue, Text or Talk in children's use of mobile technology devices for relationships, social interaction and learning. Both case studies were conducted in the UK by Emma Bond (2010) and Neil Mercer (2000). The findings by Bond and Mercer highlight this thesis' research questions about children's Dialogue and learning development. The methodology underlines a critical re-examination of the excerpts recorded by Mercer and Bond. Originally, Mercer documented the Talk for his research on children's classroom talk, teaching and learning approach. Bond documented the Dialogue with 30 school children on the use of text and talk for their social relationships. From these two cases, this thesis critically evaluated the excerpts by underpinning the use of Talk with the existing educational theories on children's Dialogue and intellectual learning development. As a result, both case studies showed significant children's intellectual development with Talk or Dialogue. Children obtain the ability to discover new things which shape their lives and the lives of others by participating and sharing resources emotionally and physically. Children deal with each other's opinions, bravely express their own views, raise

[28] Cole, M., John-Steiner, V., Scribner, S., and Souberman, E., 1978. *L. S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes,* Cambridge MA: Harvard University Press.

contentious issues and explore dissimilar possible solutions to subjects discussed in the classroom. Children gain educational benefits from their experience of learning and discourse in the classroom and this widens the scope of using language to get things done outside the classroom. Thus, children's cognitive intellectual thinking flourishes in voicing his or her ideas with others, as well as accepting criticisms during conversation. Talk is an intellectual endeavour which enables children to go beyond what he or she is capable of.

Chapter 4 - The Contribution to Knowledge

The most significant contribution to knowledge in this study is about the use of Talk or Dialogue in children; be it in the classroom or at home, children must be guided to Talk scholarly. As a result, this thesis formulate the Dialogic Framework - a framework of Dialogue Teaching and Learning approach in the Malaysian classroom for Malaysian children. This Framework is comprised of four key existing educational theories of children's speech and learning development to promote children's metacognitive learning inside and outside the classroom. In 2012, the Malaysia Education Department identified that Malaysian children lack cognitive thinking skills. A report – *Malaysia Education Department Blueprint 2013-2025* (2012) has been issued to focus on the educational strategies that highlight children's cognitive learning[29]. Rahman, et al.'s research found that Malaysian children lack metacognitive learning activities (Rahman, et al., 2011)[30]. Therefore, this thesis has produced two approaches of Dialogue teaching and learning to underpin Talk or Dialogue with the use of technological devices and the ZPD concept to fill the gaps. This framework accentuates that teachers are to ensure that children are emotionally supported, educated in ways of conversing, submitting to the consensus, discussing possible outcomes together and voicing differing opinions in the classroom. Thus, teachers are encouraged and motivated and the students have a voice. The approaches allow children to place actions and produce reactions with Dialogue that stimulates

[29] Ministry of Education, 2012. Preliminary Report, Malaysia Education Blueprint., Kuala Lumpur: Government Printers.

[30] Rahman, S., Abdullah, M. S., M. Yasin, R., Mohd Meerah, T. S., Halim, L. and Amir, R., 2011. Student Learning Style and Preferences for the Promotion of Metacognitive Development Activities in Science Class. 2011. *World Applied Science Journal 14, Special Issue of Innovation and Pedagogy for Diverse learners,* pp. 11-16.

their psychological functions of perception, attention, sensory motor-operation and memory for learning accomplishments. The teaching and learning are articulated through teacher's help and engagement with learning activities; delivering lessons, discussion, activity games, operating technological devices and tools for solving learning problems and produce learning outcomes. This framework brings minds and technological devices together for a spontaneous and livelier learning experience with teacher's support, not just by listening. These kinds of learning experiences are evident in helping teachers and learners (Purcell, et al. 2013) [31]. As a result, Malaysian children are nurtured as intellectual, educated in discourse, respected learners and caring individuals that represent Malaysian future teachers, parents, academicians or intellectuals. So, this contribution is significant for Malaysians, Education Departments and the country.

Chapter 5 - The Theoretical Discussions

Section I highlights the relationships between Dialogue and the use of social tools, social interactions and the ZPD concepts in the Dialogic Framework. These three relationships are the most important areas that this thesis has scrutinised to demonstrate the notions of Vygotsky's ideas and the pedagogic implications of the Dialogic Framework. Section II discusses Vygotsky and Vygotskian scholars who adopted the theory of children's cognitive development and the ZPD concept with speech that formed the Dialogic Framework. The theories linked together ideas of speech to children's intellectual learning development from Vygotsky, (1930)[32] to many neo-Vygotskians such as: Goswami, U. and Bryant, P. (2007), Jerome Bruner and Weinreich Haste, H. and many more (1987). Section III explains how the function of the technological tools and signs are commonly linked to children's Talk. Thus, how Talk is distinct in a child's social and cultural development. This section highlights children's Talk or

[31] Purcell, K., Heaps, A., Buchanan, J. and Friedrich. L., 2013. *How Teachers are Using Technology at Home and Their Classrooms.* National writing project, College Board and Pew Research Center.
[32] Vygotsky, L. S., 1930. *"Tool and Sign"* private archives of L. S. Vygotsky Manuscript, cited in Cole, M., John-Steiner, V., Scribner, S., and Souberman, E., 1978. *L. S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes,* Cambridge MA: Harvard University Press.

text, interaction and the use of Interactive technological devices in their intellectual development.

Conclusion

This study contributes a Talk or Dialogue teaching and learning approach framework for the Malaysian education system. The study sets out two unique approaches to teaching and learning in Malaysian schools. These approaches provides a substantial amount of knowledge improvement in teaching and learning achievements for the Malaysian children. This section summarises the *Malaysia Education Department Blueprint 2013-2025* (2012) on the educational strategies that highlight children's cognitive learning[33]. The recommendation on the implementation of the Dialogic Framework in the Malaysian classroom, the Malaysian children's performance on the Trends in International Mathematics and Science Study (TIMSS) and the Programme for International Student Assessment (PISA).

This study also hopes for continuous efforts from academicians to examine Talk or Dialogue with technological devices and psychological development of learning with interactive technological device, internet tools, human psychological functions, play and interface design in future research.

[33] Ministry of Education, 2012. Preliminary Report, Malaysia Education Blueprint., Kuala Lumpur: Government Printers.

Chapter 1 – Literature Review

Introduction

This chapter highlights the existing educational theoretical positions about Talk and Dialogue. The literature review recognises Talking in the classrooms as a source of children's thinking and learning development. This chapter examines the position of Talk or Dialogue in children's learning setting; the socio-cultural environment of Talk and social interaction; the use of social tools such as interactive technological devices; teacher's guidance in the classroom; and the effectiveness of collaborative learning. The sections discuss Talk as an approach to learning, which includes the development of children's higher psychological processes. It distinguishes the construction of children's perception, attention, sensory motor-operations and memory development. Lev S. Vygotsky claims that speech is an expression of children's psychological functions that contributes to their cognitive development[34]. His statement is important to this study and is used to examine children's speech, along with the use of the technological devices, internet technologies and online learning tools.

The section discusses research undertaken by scholars in socio-cultural behaviour of children's learning and psychological learning development such as Lev S. Vygotsky, Jean Piaget, Jerome Bruner, Robin Alexander, Neil Mercer, Karen Littleton, Diana Laurillard, David Perkins and Gavriel Salomon. These works are important for the use of Talk or Dialogue in children's learning development, with the technological devices in the classroom. Consequently, this study aims to strengthen scholars' appreciation of the use of Talk or Dialogue for teaching and learning approaches in contemporary Malaysia. This will help to fill the gaps of Malaysian child cognitive development that have been claimed by Malaysian academician such as Rahman et al. (2011)[35] and Zakaria, and Iksan (2007)[36].

In 2012, the Malaysia Education Department noted that Malaysian children lack cognitive thinking skills. A report – *Preliminary Interim Plan 2011-2020* (2012) was issued to focus on

[34] Cole, M., John-Steiner, V., Scribner, S., and Souberman, E., 1978. *L. S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press.
[35] Rahman, S., Abdullah, M. S., M. Yasin, R., Mohd Meerah, T. S, Halim, L. and Amir, R., 2011. Student Learning Style and Preferences for the Promotion of Metacognitive Development Activities in Science Class. *World Applied Science Journal 14, Special Issue of Innovation and Pedagogy for Diverse learners:* pp. 11-16.
[36] Zakaria, E. and Iksan, Z., 2007. Promoting Cooperative Learning in Science and Mathematics Education: A Malaysian Perspective, *Eurasia Journal of Mathematics, Science & Technology Education, 3 (1):* pp. 35-39.

the educational strategies that highlight children's cognitive learning[37]. The report highlights the need for a significant improvement in children's cognitive learning development[38]. Hence, this thesis emphasises the importance of a richer range of educational issues and educational stimuli in the form of new media in Malaysia, with the aim of producing students with critical thinking skills, leadership skills, bilingual proficiency, ethics and an awareness of spiritual and national identity.

This study aims to propose an educational framework on Talk or Dialogue for a new teaching and learning approach. This Framework hopes to educate the new Malaysian generation with the principles of responsibility, integrity and education. The work of Zakaria and Iksan (2007) in the *Journal of Mathematics, Science and Technology Education,* assert that there are two pedagogical limitations in Malaysian schools[39]. Lecture-based instruction and teacher-centred instruction have been characterised as the passive acquisition of knowledge; students become passive recipients of knowledge and resort to rote learning. Zakaria and Iksan (2007) claim that the teacher-talk technique - using lectures, directed demonstrations and simple Q & A, which dominates 80% of the talk in most classrooms - generally leads to students seldom asking questions or exchanging thoughts with other students in the class[40]. Other research by Saemah Rahman, Mazli Sham Abdullah, Ruhizan M. Yasin, T. Subahan Mohd Meerah, Lilia Halim and Ruslin Amir (2011), *Student Learning Style and Preferences for the Promotion of Metacognitive Development Activities in Science Class,* written for the Faculty of Education, University Kebangsaan Malaysia, has found gaps in children's learning fulfilment. The research identifies that Malaysian children lack emotional support and have no voice. They claim that children in Malaysia lack teachers' encouragement and motivation[41]. Rahman, et al.

[37] Ministry of Education, 2012. Preliminary Report, Malaysia Education Blueprint., Kuala Lumpur: Government Printing.
[38] Ministry of Education, 2012. Preliminary Report, Malaysia Education Blueprint., Kuala Lumpur: Government Printing.
[39] Zakaria, E. and Iksan, Z., 2007. Promoting Cooperative Learning in Science and Mathematics Education: A Malaysian Perspective, *Eurasia Journal of Mathematics, Science & Technology Education, 3 (1):* pp. 35-39.
[40] Ibid. pp. 35-39.
[41] Ibid. pp. 11-16.

argue that past studies have shown that children must have motivational factors in learning[42]. These gaps are claimed to be the most crucial metacognitive development activities that need to be stressed in the Malaysian classrooms. Rahman, et al. stress the needs for teachers to provide encouragement, reaction and reflection on children's ideas by writing their own comments to children. For healthy engagement, the teacher needs to respond and commit toward solving their student's learning problems. This type of engagement is lacking in Malaysian classrooms. Teachers must undergo conceptual change and gain problem solving skills. According to this study it is important to rectify this conceptual change (Rahman, et al., 2011)[43].

[42] Rahman, S., Abdullah, M. S., M. Yasin, R., Mohd Meerah, T. S, Halim, L. and Amir, R., 2011. Student Learning Style and Preferences for the Promotion of Metacognitive Development Activities in Science Class. *World Applied Science Journal 14, Special Issue of Innovation and Pedagogy for Diverse learners:* pp. 11-16.

[43] Rahman, S., Abdullah, M. S., M. Yasin, R., Mohd Meerah, T. S, Halim, L. and Amir, R., 2011. Student Learning Style and Preferences for the Promotion of Metacognitive Development Activities in Science Class. *World Applied Science Journal 14, Special Issue of Innovation and Pedagogy for Diverse learners:* pp. 11-16.

Sec 1 - Dialogue and the Development of Children's Thinking and Learning

Dialogue and the Development of Children's Thinking and Learning

Neil Mercer and Karen Littleton

Introduction

Neil Mercer and Karen Littleton are both scholars in Psychology and Education. They conducted extensive research to provide a new account of Talk or Dialogue and the development of children's thinking and learning relationships using a sociocultural approach. Mercer and Littleton shared their research findings so they can be applied in actual classrooms in the UK for teachers and students to benefit from their learning approach. Their learning approach was called 'Thinking Together'. Mercer and Littleton's research was conducted 20 years ago in Britain and elsewhere. The team was committed to helping find theoretically informed ways of facilitating children to think together. This team has been supported by the Economic and Social Research Council, the Nuffield Foundation, the Esmee Fairbairn Foundation, Milton Keynes Council, The British Council and (in Mexico) the Consejo Nacional de Asuntos Del Personal Academico of the Universidad Nacional Autonoma de Mexico (Mercer & Littleton, 2007) [44].

Mercer and Littleton emphasise that 'Talk or Dialogue' concepts are the 'ground rules of conversation'. Talk or Dialogue operates as an implicit set of rules for children to think together and to serve them well across a diverse range of situations [45]. However, participants usually pay little attention to the importance of the use of Talk or Dialogue in the classroom or at home. Teacher or parents usually take Talk or Dialogue for granted (Edwards & Mercer, 1987)[46]. Edwards and Mercer claim that Talk is not just the means for mediating and supporting individual development, rather, Talk is a way of thinking that is embedded in ways of using language[47]. Talk is not just learning, but a valuable social mode of thinking. With Talk, children

[44] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children Thinking; A Sociocultural approach*: pp. 39. Abingdon, Oxon: Routledge.
[45] Ibid. pp. 34.
[46] Edwards, D. and Mercer, N., 1987. *Common knowledge: The Development of Understanding in the Classroom,* London: Methuan/Routledge.
[47] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children Thinking; A Sociocultural Approach*, Abingdon, Oxon: Routledge.

or learners engage and interact with others. The engagement and interaction may have a profound and enduring impact on their thinking skills and intellectual development[48]. Mercer and Littleton (2007) argue that normally, in a classroom, children work in groups but rarely as groups. This means children may be seated in close proximity, but they work alongside each other rather than with each other. Mercer and Littleton mean 'joint work' to be engaging open discussion between the groups and extended discussion and arguments. Observations proved children work on disagreements, disputes and turn-taking. They interact but rarely 'interthink'[49]. In researching Talk between pupils in the classroom, Mercer and Littleton referred to Douglas Barnes and Frankie Todd's (1977) claim that children are enthusiastically engaged in joint tasks. Moreover, when children are communicating with their peers outside the visible control of their teachers or parents, they are more active and feel independent enough to voice their opinion. Talk has enabled them to take ownership of knowledge[50].

Collaborative Learning

Mercer and Littleton respond to a sociocultural approach to the learning environment that highlights the importance of interaction, collaboration, cooperation and interthinking between the teachers and the children. They argue that collaboration means more than children working together in a tolerant and compatible manner. Children being engaged in collaborative learning means that they are engaged with the task at hand. They are in a situation of helping each other and trying to solve problems among themselves. Furthermore, they also construct common knowledge of the task given[51]. Collaborative learning describes a harmonious group commitment – they share similar goals, mutual understanding, and continue to renegotiate opinions and outcomes.

Barbara Rogoff, a contributor to Mercer and Littleton's book *Dialogue and the development of children's thinking* is an authority on the subject of cognitive development within a social context . She argues that collaborators need the continual maintenance of intersubjectivity as

[48] Ibid. pp. 29.
[49] Ibid. pp. 57.
[50] Ibid. pp. 27.
[51] Ibid. pp. 25.

they progress through the activity. Intersubjectivity describes partners not only interacting and cooperating in an activity, but also interthinking about the learning task or problem[52] (Rogoff, 1990). The partners are engaged to continue to solve problems, build common knowledge, work together towards a shared goal, and support decisions and mutuality in achieving outcomes.

This specific view of collaboration is shared by other researchers such as Brigit Barron, 2000[53]. Barron investigated two contrasting groups of students. She described the interactive processes among group partners and the relationship of these processes to problem-solving outcomes. The results showed that in one group, proper proposals were produced in terms of the tasks that were agreed, validated, documented and reflected. But in the other, the results showed flaws in many aspects – for example, matters left undocumented and rejected without rationale. Barron's analysis recognised three major different dimensions in group interaction such as mutual exchanges, joint activities and engagements and harmonised problem-solving skills. The focus on group-level activities reveals unique strategies in monitoring, guiding and discovering small group learning. Thus, the group activity offers ways of understanding the reasons for the inconsistent outcomes in collaborative ventures regarding the objectives of the task and the outcomes. These measurements of working on group activities can be helpful in bringing the design and assessment of collaborative learning environments into focus.

However, Mercer and Littleton argue that observational studies have shown that collaboration in classrooms is often unproductive and inequitable. They emphasise that some studies have suggested that the quality of collaboration can be improved if more attention is given to developing an atmosphere of trust and mutual respect. Mercer and Littleton highlight that children have to do more than just engage with each other in a positive and supportive way. They also should become able to build constructive and critical pathways to each others' ideas.

[52] Rogoff, B., 1990. *Apprenticeship in Thinking: Cognitive Development in Social Context,* Oxford: Oxford University Press.
[53] Barron, B., 2000. Achieving co-ordination in collaborative problem solving groups, *Journal of Learning Sciences* 9 (4): pp. 403-436.

Research carried out in the UK

Mercer and Littleton and their research team carried out four main studies in the UK. These studies involved children of three specific age groups of 6-7, 9-10 and 13-14 which correspond to year 2, year 5 and year 8 in the English school system. These groups of children, in the Malaysian context of learning, are identified as the groups of children that need special help. They need to be nurtured with a learning strategy to promote the development of metacognition in classroom learning[54]. Past studies have shown that Malaysian children need metacognitive skills such as the ability to become self-directed learners, understand science concepts, undergo conceptual change, learn problem-solving skills, and learn the motivation for and benefit of lifelong learning[55]. The International Mathematics and Science Study (TIMSS) assessment in 2009 showed that Malaysian students were out-performed by students from five other Asian countries which were Singapore, Republic of Korea, Hong Kong, Chinese-Taipei, and Japan[56]. TIMSS assessed a variety of cognitive skills in application and reasoning. There were 18% and 20% of Malaysian's students who failed to meet the minimum proficiency levels in both subjects. Students were identified as possessing only limited mastery of basic mathematical and scientific concepts. It is important to rectify this problem with children's cognitive development. Therefore, this thesis foresees the Talk or Dialogue approach to teaching and learning would be useful for implementation in the Malaysian classroom.

Mercer and Littleton's research on children's dialogue in the classroom was done in Milton Keynes in the south-east of England where 124 participants were involved in key comparisons of the quality of children's Talk. The research included a detailed analysis of video-recordings of groups of target and control children participating in a psychological test called Raven Standard Progressive Matrices (SPM) (Raven, Court and Raven, 1995)[57]. Raven's SPM is a test of observation skills and clear-thinking capability which measures someone's ability to

[54] Zakaria, E. And Iksan, Z., 2007. Promoting Cooperative Learning in Science and Mathematics Education: A Malaysian Perspective. *Eurasia Journal of Mathematics, Science & Technology Education, 2007, 3(1):* pp. 35-39.
[55] Rahman, S., Abdullah, M. S., M. Yasin, R., Mohd Meerah, T. S, Halim, L. and Amir, R., 2011. Student Learning Style and Preferences for the Promotion of Metacognitive Development Activities in Science Class. *World Applied Science Journal 14, Special Issue of Innovation and Pedagogy for Diverse learners:* pp. 11-16.
[56] Mullis, V. S., Martin, M.O., Gonzales, E. J. and Chrostowski, S.J., 2004. TIMSS 2003. *International Mathematics Report,* TIMSS & PIRLS International Study Centre, Lynch School of Education: Boston College.
[57] Raven, J., Court, J. and Raven, J. C., 1995. *Manual For Raven's Progressive Matrices and Vocabulary Scales*, Oxford: Oxford Psychologists Press.

observe, solve problems, and learn. By using this method, children were being tested on their ability to reason by analogy, independent of their language abilities and formal schooling. The tests consist of a series of incomplete sets of geometric shapes. Children have to complete these sets of shapes in a logical manner. The experiment's function in the research was to measure any effects that collaborative social activity might have on the development of children's ability to reason. The team used this method to assess both the effects on children's collective problem-solving skills and also their individual reasoning. The results of the collective reasoning showed that 'Thinking together' was changing the ways that children used language as a tool for collective reasoning. The children who had participated in Thinking together discussed issues in greater depth and for longer periods of time, participated more fully and equitably, more often sought justifications and provided reasons to support their views. Mercer argued that children who participated in the 'Thinking together' programs seek and provide reasons in sharing their thoughts and evaluating any results they have made. All members of the program often asked for information and opinions, challenged each other constructively and get involved for a joint conclusion. Each opinion is considered with respect, all members have the opportunity to contribute ideas and discuss. Mercer claimed that children participate enthusiastically in the tasks and critically examine the ideas that were being brought up. In some cases they may disagree but they resolve the disagreement through discussion. As a result, they contribute and achieve more knowledge together, they also have the opportunity to learn and practise better ways of communication. They are mutually working together. These findings are reported in detail in Mercer and Wegerif, Mercer, et al. (Mercer, Wegerif and Dawes, 1999)[58].

Researching 'talk' between pupils in the classroom

Mercer and Littleton looked at how pupils communicate and build collaborative learning environments in the classroom. Contributors to Mercer and Littleton's writing, Barnes and

[58] Mercer, N., Wegerif, R. and Dawes, L., 1999. 'Children's talk and the development of reasoning in the classroom', *British Educational Research Journal* 25 (1): pp. 95-111.

Todd, (1995) argue that knowledge can be treated by pupils or students as a negotiable commodity[59]. They argue that pupils prefer to be engaged in an open and extended discussion and that arguments between them are better without peers and teachers who then are present. Children are more active and independent in voicing their opinion, Barnes and Todd claim that Talk has enabled children to take charge of the ownership of knowledge. Barnes and Todd also assert that learners are able to negotiate their own criteria of relevance and truth; they have the ability to change the nature of their own learning. Barnes and Todd argue that by having responsibility in the learners' hands, the nature of learning changes. Here, pupils are required to negotiate their own criteria of relevance and truth. Barnes and Todd further argue that if schooling is to prepare young people for responsible adult life, such learning has an important place in the repertoire of social relationships. Barnes and Todd's detailed observations suggest that classroom discussion has to meet certain requirements for explicitness that would not normally be required in everyday conversation. Learning as we recognised, is not just listening, reading and writing. Learning includes the use of gesture, diagrams and tools. Learning is more distinctive in its own processes of social interaction, the use of tools and the relationship between teachers and learners. Teachers and learners are two parties that need each others' support, views and exchanges of ideas in learning values. As a result, the quality of learning outcomes will be increased.

The social relationships between teachers and students are important in educating young people to be responsible in the future. Barnes and Todd argue that explicit discussions in the classroom need to be done in order to meet certain requirements in everyday conversation. They maintain that knowledge should be made publicly accessible, relevant information should be shared effectively, opinions should be clearly explained and explanations should be examined critically. Therefore, learners are able to determine the success of educational activity through group work. For example, by sharing views about what is relevant to the discussion or by having a similar idea about what is trying to be achieved. Interestingly, Barnes and Todd are not alone in arguing this. Research shows that these points have been supported by Bennett and

[59] Barnes, D and Todd, F., 1995. *Communication and Learning Revisited*, Portsmouth, NH: Heinemann.

Dunne in 1992, Galton and Williamson in 1992 and Mercer and Littleton in 2000. The successful pursuit of educational activity through group work depends on learners sharing views about what is relevant to the discussion and having a clear idea of what is trying to be achieved.

Resnick, et al. (1997) say: "Talk and social interaction are not just the means by which people learn to think, but also how they engage in thinking... [D]is course is cognition is discourse... One is unimaginable without the other"[60]. Resnick, et al.'s arguments highlight talking and social interaction, these two denote more than thinking. The processes of discourse signify more than Talk or Dialogue, the gesture, the perception and the attention of the participants count. The interaction means the connection and feeling between the people. Therefore, in the classrooms, Talk or Dialogue between teachers and children develop ways of thinking that are embedded in using language. Briefly, in supporting each and everyone's learning development, Talk or Dialogue is more than the mediating means between teachers and children. Talk or Dialogue means relationships and guidance. Children will accomplish a valuable educational goal that educates their informative accomplishment in learning and intellectual development with teachers help in the classrooms and parents or adults help at home.

Quality of interactions

Mercer and Littleton cite Blatchford, et al. (2003), arguing that classroom learning is a social activity. They maintain that training should be given to teachers to promote the development of good relationships and interpersonal trust between children. Blatchford and colleagues have developed an educational intervention program that they characterise as using a relational approach to the development of group working (Blatchford and Kutnick, 2003)[61].

[60] Resnick, L., Pontecorvo, C. and Saljo, R., 1997. '*Discourse, tools and reasoning',* in L. Resnick, R. Saljo, C. Pontecorvo and B. Burge (eds) *Discourse, Tools and Reasoning: Essays on Situated Cognition,* Berlin and New York: Springer-Verlag.

[61] Blatchford, P., and Kutnick, P., 2003. 'Developing Group Work in Everyday Classrooms', Special Issue, *International Journal of Educational Research,* 39 (1-2): pp.1-172. Blatchford, P., Kutnick, P., Baines, E. and Galton, M. 2003 'Towards a Social Pedagogy of Classroom Groupwork', *International Journal of Educational Research* 39: pp. 153-172.

They argue that discourses in collaborative learning processes lead to improved understanding. The participants are willing to share their understanding and keep on doing tasks set by teachers despite their disagreements and conflicts. They describe this as: 'The fact that children can ever be productive at all relies on the participants in this process for the time being, feeling obliged to each other, staying with each other and maintaining togetherness' (Van Oers & Hannikainen, 2001)[62]. In the classroom context, Talk is crucial as children are learning and staying together. They feel obliged to each other as learning has taken place with the teacher. In this context, children in a classroom are more likely to listen, work and discuss the lessons taught. As a result, the teacher and the children both want to achieve the objective of the lesson. They were asked to participate in the question and answer sessions during lessons by the teacher, so that they are in the collaborative learning environment. (Barron, 2000)[63]. M. Nystrand, (1986) asserts the validity of a collaborative learning environment involving a coordinated joint commitment to common goals, obligation, mutuality and the continual (re) negotiation of the task[64]. Ryder and Campbell, (1989) argue that participants in collaboration may experience a 'group sense' or a feeling of shared endeavour[65] which brings satisfaction to all.

Mercer and Littleton also emphasise the importance of the relationship between pupils as partners during interaction and working together. Accordingly, researchers such as Azmitia and Montgomery (1993) investigated how friendships mediate joint activity [66]. Azmitia and Montgomery show that the adolescents paired with friends got higher results in problem solving tasks than the adolescents paired with acquaintances. The cognitive advantages of working with a friend, however, are only evident in the most difficult problems. The results showed that friends were more keen to evaluate solutions, justify their proposals spontaneously,

[62] Van Oers, B. & Hannikainen, M., 2001. 'Some thoughts on togetherness: an introduction', *International Journal of Early Years Education* 9 (2): pp. 101-108.
[63] Barron, B., 2000. 'Achieving co-ordination in collaborative problem-solving groups', *Journal of the Learning Sciences* 9 (4): pp. 403-436.
[64] Nystrand, M., 1986. *The Structure of Written Communication: Studies of Reciprocity Between Writers and Readers*, London: Academic Press.
[65] Ryder, J. and Campbell, L., 1989. 'Groupsense: when groupwork does not add up to "groupwork"', *Pastoral Care in Education* 7 (1): pp. 22-30.
[66] Azmitia, M. and Montgomery, R., 1993. 'Friendship, Transactive Dialogues and the Development of Scientific Reasoning'. *Social Development*, 2 (3): pp. 202-221.

elaborate and critique each other's reasoning and engage in discussions. Participation, it seems, is associated with better problem solving skills. The close relationship effects of interpersonal trust between the children mediate their cognitive development. Howes and Ritchie, (2002)[67] and Underwood and Underwood, (1999)[68] each claim that close relationships, characterised by a sense of that trust and mutuality, enhance learning. Thus, the interaction between the children while working together is important because friendships mediate joint activity. Mercer and Littleton report that the results of this research are to be used in understanding the developmental features of relationships. They stress the need to take a longitudinal approach to the study of the relationship between transitive dialogues and the development of scientific reasoning.

Mercer and Littleton quoted Willard W. Hartup (1998)[69], and Peter Kutnick and Alison Kington, (2005)[70] in the conclusion of their research findings. Their research was on girls' friendship pairings created to perform the hardest science reasoning task levels and boys' friendship pairings performing at a lower academic level. Both boy and girl acquaintance pairings performed the set task at medium levels. The aim was to analyze children's friendship grouping as a reasonable basis for cognitive development in classrooms. The study took account of the gender, age and ability level of children to question whether classroom-based friendship pairings perform better on cognitive tasks than acquaintances. The findings in interviews revealed that boys' and girls' friendship pairs were likely to participate in different types of activity. The girls inclined towards strong friendships through school activities. Boys friendships were orientated on the engagement of shared activities outside schools.

That said, the researchers have found that the relational closeness is associated with the sharing of ideas, exchanging points of view and a collective approach to challenging tasks.

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[67] Howes, C. and Ritchie, S., 2002. *A Matter of Trust: Connecting Teachers and Learners in the Early Childhood Classroom*, New York: Teachers College Press.
[68] Underwood, J. and Underwood, G., 1999. *'Task Effects in co-Operative and Collaborative Learning with Computers'*, in K. Littleton, and P. Light (eds.) *Learning with Computers: Analyzing Productive Interaction*, London: Routledge.
[69] Hartup, W.W., 1998. *'The Company They Keep: Friendships and Their Developmental Significance',* in A. Campbell and S. Muncer (eds) *The Social Child*, Hove: The Psychology Press.
[70] Kutnick, P. and Kington, A., 2005. 'Relational Training for Group Working in Classrooms: Experimental and Action Research Perspective', paper presented as part of the *Educational Dialogue Research Unit Seminar Series*, Open University, Milton Keynes.

Carollee Howes and Sharon Ritchie (2002) and Kagan J. Underwood and Lynn G. Underwood (1999) argue that close relationships, characterised by a sense of trust and mutuality, enhanced learning. Underwood and Underwood (1999) established evidence that a pair of children working together on a computer-based problem-solving activity achieved the best results in expressing opinions, analyzing the situation in words and expressing agreement and understanding. The overall experiments show evidence that focused, sustained discussion amongst children helps children solve problems and promotes learning [71]. Mercer and Littleton relate this approach to investigating collaborative activity in the creative arts, where the pupils work in a group task classroom activity for assessment. Swann's, (1992) experiment shows how the different interactive styles of boys and girls influenced the ways knowledge is constructed and how it affects the experience for those involved. Her work is in mixed-gender groupings. She claims that male students of all ages tend to dominate discussions, make direct comments to partners and adopt more executive roles in joint problem-solving. Swann evaluated the collaboration and interaction in terms of outcome not process [72].

How dialogue contributes to children's intellectual development

Talk or Dialogue is a distinctive role of spoken language in learning and development. Dialogue is a broad concept, but Mercer and Littleton just focus on the significance of Talk or Dialogue in the interchange of ideas between the teacher and learner. They use both terms "Talk" and "Dialogue" in specifying the classroom talk. Dialogue is established on the idea that teachers might encourage pupils to talk together and provide explanations in the tasks they set them. Talk or Dialogue in the classrooms focuses on a narrower definition of the process of talk that takes place in the course of educational activities. The Talk or Dialogue that Mercer and Littleton intended emphasises teacher-student exchanges and discussions amongst students. Their analysis underline teachers' use of questions and the content of the tasks, activities and discussions undertaken by the children.

[71] Underwood, J. and Underwood, G., 1999. *'Task effects in co-operative and collaborative learning with computers'.* In K. Littleton, and P. Light (eds.) *Learning with Computers: Analyzing Productive Interaction,* London: Routledge.
[72] Swann, J., 1992. *Girls, Boys and Language,* London: Blackwell.

Mercer and Littleton maintain that people can make sense of the world together by using actions, graphic representations and various kinds of symbol systems as well as language. Language is understood as creative, ubiquitous, convenient and flexible. For reasoned arguments especially, it is the one most intimately connected to the creation and pursuit of Talk or Dialogue. For teachers, language is their main pedagogic tool. Mercer and Littleton claim that teachers involvement in education requires them to be distinctive in using language as a way of interacting with the learners. Therefore, due to the requirement of their role in education, their special consideration for children's Talk or Dialogue in learning is crucial. Mercer and Littleton assert that children would one day socialise with many other people in their society and networking circles. It is known that a child's natural ability to use language is varied, depending on differences in mother tongue, dialect and accent, social origins and so on. The main aim of the pedagogic dialogue is to help a child become a social actor, not just a developing individual (Mercer and Littleton, 2007)[73].

Mercer and Littleton emphasise that research in the USA has provided evidence to support the view first coined by Basil Bernstein, (1975)[74] and Betty Hart and Todd. R. Risley, (1995)[75]. The amount and quality of the dialogue children experience at home is comparable to their eventual academic achievement. Hart and Risley argue that it's crucial to have a varied language experience at home, as well as rational debates, logical deductions, reflective analyses, extended narratives and detailed explanations of discussions. But in some homes, these experiences may never be had. The importance of Talk was also argued by Shirley Brice Heath (1983). Heath argues that ways with words are not part of children's experience. Heath asserts that there is not an adequate emphasis on education policy and practice on the value of teaching children how to use language for learning. And with life enrichment and varied language experience, children can never include those languages into their repertoires if they

[73] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children Thinking; A Sociocultural approach*, Abingdon, Oxon: Routledge.
[74] Bernstein, B., 1975. *Class, Codes and Action. Vol III: Towards a Theory of Educational Transmissions,* London: Routledge and Kegan Paul.
[75] Hart, B. and Risley, T.R., 1995. *Meaningful Differences in Everyday Experience of Young American Children,* New York: Brookes.

have no role models for doing so (Heath, 1983)[76]. Heath claims that her research has shown that when the teacher focuses on the development of children's language as a tool for reasoning, it leads to significant improvements in the quality of children's problem-solving and academic attainment[77].

Thus, Mercer and Littleton conclude that without the example and guidance of a teacher, children are unable to gain access to some very useful methods of using language. Language is a tool for one's reasoning abilities, learning endeavours and for working individually or collaboratively. Learning, reasoning and working use ways with words which need examples and guidance from adults (Mercer and Littleton, 2007)[78].

What is the meaning of learning and development?

Learning and development are two words that have two different meanings and processes. Mercer and Littleton argue that learning and development are two terms that have both been used widely by scholars. Learning is usually accompanied by the teaching process. These two words; learning and development, are required for the kinds of cognitive, intellectual changes that he and his team are interested in. Learning, they assert, is normally associated with the achievement of knowledge and the ability to acquire some fact or skill. Development is something that implies some change of a progressive kind, invoking ideas of growth, an appearance of a new entity and an arrival of a new state of affairs. Mercer and Littleton elaborate on Chris Watkins' three influential concepts of learning in his journal article, *Learning: a Sense Maker's Guide,* (Watkins, 2003) [79]. Watkins identifies learning as being taught, individually making sense of the information and building knowledge with others. Mercer and Littleton see these three concepts as complementary to their research that is concerned with the ways people learn to make sense of the world. Mercer and Littleton argue

[76] Heath, S. B., 1983. *Ways with Words: Language, Life and Work in Communities and Classrooms,* Cambridge: Cambridge University Press.
[77] Heath, S. B., 1983. *Ways with Words: Language, Life and Work in Communities and Classrooms,* Cambridge: Cambridge University Press.
[78] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children Thinking, A Sociocultural approach*, Abingdon, Oxon: Routledge.
[79] Watkins, C., 2003. *Learning: A Sense Maker's Guide,* London: The Institute of Education.

that children must be able to take on new perspectives such as those inherent in science, mathematics and other subjects through Dialogue. Children gain new knowledge from social interaction and communication. Dialogue enables children to progress and makes them capable of doing certain kinds of intellectual activities (p. 3).

Learning together – the quality of relationships

Mercer and Littleton additionally claim that learning together involves good quality relationships between the learners. They argue that interpersonal closeness is allied to the contribution of ideas, exchanging of viewpoints and a collective approach to problem-solving. The learners find connectivity and interest in each other. The development of close relationships is characterised by a sense of trust and mutuality which will enhance the learning process. In effective group work, learners create a collaborative workforce that points out ideas, discusses problems and finds solutions together. A point reinforced by Howes and Ritchie, (2002)[80] Underwood and Underwood, (1999)[81] and Blatchford, et al. (2003) [82]. These findings have led the scholars to claim that a 'relational' approach to group working is essential and recognise that classroom learning is a social activity. Mercer and Littleton argue that the results from experimental studies support the view that collaboration can have a significant impact on children's learning and development [83]. Talk is a good reason for social action, the means by which children learn. It is a valuable and a social mode of thinking in itself. Mercer and Littleton go on to argue that some studies have recommended that the quality of collaboration can be improved with additional attention given by the teacher or parents. Collaboration develops an atmosphere of trust and mutual respect.

[80] Howes, C., and Ritchie, S., 2002. *A Matter of Trust: Connecting Teachers and Learners in the Early Childhood Classroom*, New York: Teachers College Press.
[81] Underwood, J. and Underwood, G., 1999. *'Task Effects in co-Operative and Collaborative Learning with Computers',* in K. Littleton, and P. Light (eds.) *Learning with Computers: Analysing Productive Interactive,* London: Routledge.
[82] Blatchford, P. And Kutnick, P. 2003. 'Developing Groupwork in Everyday Classrooms', Special Issue, *International Journal of Educational Research, 39 (1-2):* pp. 1-172.
[83] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children Thinking; A Sociocultural approach*, Abingdon, Oxon: Routledge.

Implications for the future

Mercer and Littleton emphasise the sociocultural approach of teaching and learning with Dialogue. They hope to find a key feature of a collaborative kind of teaching and learning between teachers and children. They analyze and evaluate educational Dialogue orientated to the past and future. Which means they want to acknowledge Dialogue as the base of common knowledge that will enable participants to make sense of talking together. For Mercer and Littleton, Dialogue is a cultural artefact which embodied participants' practical knowledge about how to talk in a particular kind of situation. For example: Dialogue is 'the rules of the game' for its speaker. Classroom dialogue depends on speakers understanding its topics and being able to convey the topics and the message that he/she is trying to give or teach. The speaker could use their own existing knowledge to build contextual foundations for the progress of their talk. Talk itself could become a tool for creating new shared understanding. Dialogue would not be finished in just the classroom. Learners take up topics they discussed on earlier occasions and they can transfer the experience they have. Thus, they learn about their discussions in terms of future activities and outcomes (Mercer, 1995, 2000; Littleton, 1999; Rojas-Drummond, 2000; Mercer & Littleton, 2007)[84].

In 2007, Mercer, et al. worked on teacher-pupil communication teaching and learning approaches. This work was about the introduction and the use of Information and Communication Technology (ICT) in educational settings by Julia Gillen, Judith Staarman Kleine, Karen Littleton, Neil Mercer and Alison Twiner entitled: "A 'learning revolution'? Investigating pedagogic practices around interactive whiteboards in British Primary classrooms". They argued about the need for a more detached consideration and evaluation of Interactive White Boards (IWB) as a pedagogic tool in British Primary classrooms. They claimed that tools are mediating artefact for teaching and learning attainment. They took into account the relationship between the affordances of IWBs, the pedagogical practices of teachers

[84] Mercer, N., 1995. *The Guided Construction of Knowledge: Talk Amongst Teachers and Learners,* Clevedon: Multilinguil Matters. Littleton, K., 1999. *"Productivity Through Interaction: an Overview',* in K. Littleton and P. Light (eds.) *Learning with Computers: Analysing Productive Interaction,* London: Routlegde.

and the communicative repertoires of teachers and pupils[85]. The use of IWBs in the classrooms according to Mercer, et al., encourages explicit reasoning and joint construction of knowledge. The use of IWBs could be the artefact to be examined and recommended for Malaysian classrooms. With the teaching and learning approach that emphasises the use of Talk or Dialogue in the classroom, the IWB is a useful tool for children and teachers.

Conclusion

Mercer and Littleton claim to have shown that applied practical educational research can be simultaneously theoretical and practical. Indeed, they would argue that it is necessary to weave these two strands together. That said, they hope that the theoretically informed ideas about teaching and learning and the hypotheses about the relationship between cognitive development and language use can be transformed into empirical investigations. The investigations can then provide new insights into 'what works' and thus provide an evidential base for practice of the most robust kind. They further stated that applied studies can also result in the refinement, re-working and development of theory. They meant 'theory' as an elucidation of interpretations that helps academics understand the generalities of a phenomenon across specific situations. With that, they hope that it can be tested against the evidence provided by careful research. Mercer and Littleton further assert that researchers should undertake work with other education professionals and students because of their concern about Talk and children's development.

The dialogue between the teacher and the children in the classroom is of considerable value to this study. Moreover, collaborative learning in an environment of thinking together can have significant impact on children's cognitive learning and development. In conclusion, Talk is acknowledged as a valuable, social mode of thinking, not just learning. Nonetheless, for educational goal achievements, this study is concerned with using Talk or Dialogue learning in a Malaysian educational context. Is Malaysia ready to use Talk or Dialogue for shared ideas and collective reasoning in the classroom between the children and the teacher?

[85] Gillen, Julia; Kleine Staarman, Judith; Littleton, Karen; Mercer, Neil and Twiner, Alison., 2007. A "learning revolution"? Investigating pedagogic practices around interactive whiteboards in British Primary classrooms. *Learning, Media and Technology*, 32(3): pp. 243–256.

Section II - The sociocultural theory of Learning

The sociocultural theory of Learning

Introduction

The previous literature review explained the details of dialogue and the development of children's thinking and learning by Mercer and Littleton. They draw on extensive research to provide an account of Talk or Dialogue in the classroom and the development of children's cognitive thinking. Mercer and Littleton wished their research findings to be applied in actual classrooms for the teacher and student to benefit from the learning approach called 'Thinking Together', an approach that emphasises pupils talking or dialoguing and thinking together in the classroom with the help of their teachers. We have learned that 'Dialogue and Development' implies some change of a progressive kind in children. Mercer and Littleton claim that dialogue and development invoke the idea of children's cognitive growth. With the ability to talk and engage in learning through Dialogue, children appear as intellectual individuals that represent their society (Mercer & Littleton, 2007)[86]. They further claim that Dialogue contributes to the ways that children can understand each other and gain knowledge through social interactions. Children carry out their intellectual activities better with Dialogue. In turn, this section highlights a number of arguments on dialogue using the perspective of sociocultural theories made by several scholars, including Bruner, Vygotsky, Alexander, Laurillard, Perkins and Salomon.

Education and culture

Children's developmental theorist and psychologist Bruner (1996) reveals how education can guide children into their culture. Bruner is an American psychologist, who contributed significantly to educational psychology in cognitive and learning theory. He made an insightful contribution to the research in education psychology and the development of curriculum theory. This section illustrates some important claims within educational theory and cognitive

[86] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children Thinking, A Sociocultural Approach*, Abingdon, Oxon: Routledge.

psychology. Bruner applied the newly emerging "cultural psychology" to education. He argued that through participation in cultural activity, the human brain achieves its full potential of intellectual learning. Potential, not just for intellectual learning in classroom subjects, but more importantly in the human response to ways of distinguishing things like philosophy, emotion, and conversation. Since 1966, Bruner has done his research on the development of children's learning, targeting inter-subjectivity, the nature of the human mind, meta cognition and collaborative learning. He claims that children must firstly think for themselves, then they will truly understand something. Teaching must provide learners with language opportunities so that learners can participate in the culture. A child's mind only reaches its full potential through many ways of perceiving, thinking, feeling, and carrying out discourse. Their potential development comes not just through formal educational endeavour. A child encounters something that enables him or her to progress further in life so that they are capable of managing themselves. A child needs to understand something in order to achieve a broader concept or theory of living. Knowledge itself is organised into its conceptual structures that are self-evident and also redundant. Consequently, learners need, Bruner contends, to further their own cognitive efforts to obtain new knowledge because one's knowledge is used in reference to what one has known before[87]. That means people learn from each other through action, example, Talk or Dialogue etc. The knowledge is meant for sharing. Having that said, Bruner argues that there are two primary modes of thought, namely the Narrative mode and the Paradigmatic mode. The Paradigmatic mode is described as definitive, while the Narrative mode is described as storyline. Bruner claims that narrative is important in the process of education as it is a mode of thinking about and organizing our knowledge. Thinking takes the form of tales and gripping drama. A 'narrative' discourse is a story of events that go in sequence – it reveals something unexpected, or redresses the imbalance that prompted the telling of the story in the first place. The brain engages in chronological, action-oriented, detail-

[87] Bruner, J. S., 1996. *The Culture of Education*, Cambridge MA: Harvard University Press, pp. 56-60.

driven thought in the Narrative mode (Bruner, 1996, p.119-121)[88]. On the other hand, the mind goes beyond the particulars to achieve systematic, definite cognition in the Paradigmatic mode. Bruner claims that the mind is an extension of the hands and the tools that you use and the jobs to which you apply them (p.151). As a result, the 'Things' that we usually do are controlling our mind, so that we do it carefully and systematically not just for the sake of doing it. For example, tending the garden, or paying the bills, washing the dishes etc. people's skills become habits and knowledge is only beneficial when it reflects habit, claims Bruner. He further claims that education cannot be reduced to just information processing or sorting knowledge into categories. Learners require understanding in constructing the meanings of their culture on any subject. Bruner was concerned about how an individual equips himself for education and how he participates in the culture.

For Mercer and Littleton, (2007) the idea of education and culture are interesting and challenging[89]. They argue that all kinds of Dialogue must be appreciated in all kinds of settings. It requires that the participants have some shared understanding of how they are making the interaction happen. The participants must have compatible ideas of what it is appropriate to say and do, or know what is not. Because each individual has their own thoughts and opinions, one can say something in the argument to voice their point of view, happy or otherwise. Mercer and Edwards, (1987) emphasise that the Dialogue concept is the 'ground rules of conversation'. They claim Dialogue operates as an implicit set of rules for behaving in particular kinds of situations even though many people always take it for granted[90]. For example, they claim, in the school or in the house, sometimes people take for granted the teaching of using language to talk. For example, a teacher teaches the subject lesson of the day. She then asks children to answer questions by writing the questions and answers down instead of discussing the questions together. Perhaps, by discussing together in the classroom, a teacher can help children to voice their opinions and find the best solution to the questions. Mercer and Edwards

[88] Bruner, J. S., 1996. *The Culture of Education*, Harvard University Press, Cambridge, Massachussets, London, England.
[89] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children Thinking, A Sociocultural approach*, Abingdon, Oxon: Routledge.
[90] Edwards, D. and Mercer, N., 1987. *Common Knowledge: The Development of Understanding in the Classroom*, London: Methuan/Routledge.

conclude that the relationship between time, talk and learning in the classroom between teachers and students is essential if teachers explore the use of Dialogue with discussions and shared experience. With these, there is the coherence of educational experience and an analysis of the ways of applying Dialogue among them.

The Dialogue as social-cultural tool

Alexander (2008) has conducted various research on the use of Dialogue in children's classroom learning since 1981[91]. Initially, prompted by the findings from a comparative study of primary education in England, France, India, Russia and the United States, Alexander made a detailed analysis of Talk from classrooms in these five countries. He argues that conversation or verbal exchange is the base of learning and has always been the essential teaching tool in school. He claims that in Britain, classroom talking is used less compared with writing. Children are being assessed through their writing on the topic of discussion. The team concluded their findings with evidence that 'classroom talk' is as important and needs to be implemented in Britain's classrooms. The talk that they heard and recorded was one of the strongest areas for comparison.

Over the many years of research in educational Dialogue, he has put Talk as the prominent element for effective thinking and learning in the classroom (Alexander, 2001) [92]. He has characterised talk as a distinctive pedagogical approach called 'Dialogic Teaching'. Alexander identified several strands. He argues that first and foremost is the assertion that psychology, language and thought are closely related. Children's cognitive development depends so much on the forms and contexts of language they have encountered and used. Children are not simply engaging in one type of learning but they learn the foundations of learning itself. He also mentioned Vygotsky and Piaget's idea of cognitive learning by interaction. In adopting Vygotsky's theory of social interaction and cognitive learning, Alexander claims that interaction is critical not just for children's understanding of the kind of knowledge with which

[91] Alexander R. J., 2008. *Towards dialogic teaching – Rethinking Classroom Talk*, 4th edition.
[92] Alexander R. J., 2001. *Culture and Pedagogy: International Comparisons in Primary Education*, Blackwell, pp. 391-528.

schools deal, such as mathematics, science and the rest, but the interaction is also for the development of their very identity and sense of self and worth (Alexander, 2008)[93]. Alexander uses the term 'scaffolding', first coined by D. Wood, J. Bruner and G. Ross (1976). These three scholars are professionals in psychology and children's learning relevance. Writing in the context of mother and child interaction, Bruner and Haste (1987) used the word 'scaffolding' to describe children's interaction as a critical role in the process of cognitive distribution (Wood, Bruner & Ross, 1976, pp.89-100)[94]. They argue that adults must teach children with linguistic opportunities and encounters which will enable them to think for themselves. Bruner and Haste highlight the importance of education to children by adults, parents or teachers. They need to initiate ways of educating children as much as possible. For example, in schools, teachers must create opportunities for talking in the classroom by asking questions before starting of with their subject. Or, in delivering the subject's task, they can discuss the overview of the subject, explain briefly the synopsis of the subject and narrate their experiences in the subject. This way, children are able to get the feel of the relationship between them. The feeling of enthusiasm to learn with a knowledgeable teacher that cares, is respected by the children. At home, children feel the same with their parents who care to explain, talk and are knowledgeable. Children then feel confident and have more initiative in finding more knowledge available somewhere else. Children will go on to recognise the principle of collaboration. They will understand the process of learning, the nature of the human mind to share knowledge and learn from each other and the Metacognition of how learning and teaching apply between humans. John H. Flavell (1979) describes metacognition as[95]:

> *"Metacognition refers to one's knowledge concerning one's own cognitive processes or anything related to them, e.g., the learning-relevant properties of information or data. For example, I am engaging in metacognition if I notice that I am having more trouble learning A than B; if it strikes me that I should double check C before accepting it as fact".*

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[93] Alexander, R. J., 2008. *Towards Dialogic Teaching – Rethinking Classroom Talk*, 4th edition, pp.11.
[94] Wood, D., Bruner, J. S. and Ross, G., 1976. The Role of Tutoring in Problem-Solving. *Journal of Child Psychology and Child Psychiatry*, 17: pp. 89-100.
[95] Flavell, J. H., 1979. "Metacognition and cognitive monitoring. A New Area of Cognitive-Development Inquiry". *American Psychologist* 34: pp. 906–911.

(Flavell, 1976, p. 232).

Metacognition in nature describes human cognitive thinking skills. Each human is able to seek knowledge over thinking and analyzing in learning situations. Thus, humans plan to approach a learning task, monitor the progress and evaluate the results to achieve the best outcome.

Yvonne Rogers and Judi Ellis (1994) claim that cognitive distribution is used in different ways by different disciplines. The proponents of their argument describe how thought is dispersed among other things, people and tools when interaction happens with people, surroundings, technologies and society[96]. They wrote in the *Journal of Information Technology* (1994) with the aim of supporting the interactive nature of information cognitively and socially. They argue that the external representations used in interactive situations are the implicit shared knowledge of individual events and work practices. Computers and other technological tools of information resources are couched to provide support for many interleaving forms of social and cognitive interactions. Rogers and Ellis claim that distributed cognition is the learning process of many activities between people. For example, in problem solving between people, the role of verbal and non-verbal behaviour is experienced. People learn from what is said, what is implied by glances, winks, or what is not said. This also includes the various coordinating mechanisms such as rules and procedures that are used. Ways of communication such as the skills and activities involved in collaborations, knowledge sharing and assessment are evaluated and accessed for outcomes to be reached. They wrote[97]:

> *"An important aspect is to identify the problems, breakdowns and the concomitant problem-solving processes that emerge to deal with them. The analysis can also be used to predict what would happen to the way information is propagated through a cognitive system using a different arrangement of technologies and artefacts and what the consequences of this would be for the current work setting".*

[96] Rogers, Y and Ellis, J., 1994. Distributed Cognition: An alternative framework for analyzing and explaining collaborative working Published in *Journal of Information Technology*, vol 9(2): pp. 119-128.
[97] Ibid, pp. 119-128.

(Rogers and Ellis, 1994, pp. 119-128)

This view is closely aligned to the theory of the 'Zone of Proximal Development' (ZPD) by Vygotsky (1962)[98]. Although Vygotsky is long dead, his contributions to the educational psychological development of children and learning are still being used today (Mercer and Littleton, 2007)[99]. Vygotsky produced many manuscripts before he died. Many of his works were about psychology, children's learning, thought and language, thought and speech, the higher psychological function, the use of tools and cognitive development. Many of these were documented in the book *L. S. Vygotsky – Mind in Society: The Development of Higher Psychological Processes*, (1978).[100] Vygotsky has figured highly in American psychology since the publication of his monograph *Thought and Language*, (1962)[101]. Vygotsky (1962) and Simon (1963; 1987) argue that ZPD is the gap between a child's existing knowledge and ways of solving problems or understanding unaided which can be achieved only with the guidance of the teacher or a 'more capable peer'[102]. Alexander claims that evidence has shown this concept is advantageous to the learner[103].

Children's psychological learning development

The theory of children's learning development and the sociocultural factors contributing to their psychological and cognitive development were initiated by Vygotsky. His work was known since the publication of his monograph *Thought and Language* in 1962[104]. Two years after his death, the Communist Party halted all psychological tests in the Soviet Union. Much of his work was only recovered 20 years later (Cole, et al. 1978, p.10)[105].

[98] Vygotsky, L. S., 1962. *Thought and Language*, Cambridge, MA: MIT Press.
[99] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children Thinking, A Sociocultural approach*, Abingdon, Oxon, Routledge.
[100] Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., 1978. *L. S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press; London, England.
[101] Ibid. Editors' preface.
[102] Simon J., 1963. Vygotsky and the Vygotskians', *American Journal of Education*, Simon, B. and Simon, J. 1987. (ed) *Educational Psychology in the U.S.S.R.*: pp. 21-34. London: Routledge.
[103] Alexander, R. J., 2008. *Towards Dialogic Teaching – Rethinking Classroom Talk*, 4th edition, pp.11.
[104] Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., 1978. Editors' preface. *L. S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press.
[105] Ibid. Pp.10.

Vygotsky asserts that children construct meaning through interaction with others, and through the interplay of what they newly encounter and what they already know. Goswami and Bryant (2007), Bruner and Haste (1987) and Vygotsky (1962) argue that a child's cognitive development requires that it engages, through verbal communication with adults, other children and the wider culture[106]. Learning needs involvement and support of others especially for a specific cultural purpose. Learning is the engagement between people in a community. Learning is the interaction and role played by teachers, adults and parents. This statement relates to Vygotsky's theory of children's psychological learning development which emphasises the use of social tools, social interaction, speech, play and development. Vygotsky points out the relationships of humans in their social-cultural context. Vygotsky emphasises how human beings change themselves in the varied context of culture and history. Vygotsky argued that humans internalise the shared experience with their social group. In this context children were observed as being able to differentiate between good and bad, as well as evaluate positive and negative outcomes wisely. Here, human cognition has the capacity to externalise and internalise their own activities. The process is called the development of higher psychological functions. Vygotsky asserts that the intermental level is the process of interaction, communication or learning between the child and others. These processes then become the basis for the child's future actions. Their actions such as discussion, interaction and argument are then internalised as the basis for their intramental (inside the child) reflection and logical reasoning. Intramental abilities such as thinking and reasoning exist within the child. Thus, learning and development are seen as both interpersonal and intrapersonal processes mediated by cultural tools. Children learn and develop through their social interaction and communication with others, at the same time they are able to think, reflect and reason. An intrapsychological activity in the child's mind develops in the course of these two activities.

[106] Goswami, U. and Bryant, P., 2007. *Primary Research Survey 2/1a, Children's Cognitive Development & Learning*, Copyright © University of Cambridge; Vygotsky, L.S. 1962. *Mind in Society: the development of higher psychological processes*, Cambridge MA: Harvard University Press; Bruner, J. S. & Weinreich-Haste, H., 1987. *Making sense: The child's construction of the world*, pp. 21.

Distributed Cognition and its relationship within sociocultural settings

Perkins and Salomon, (1979) scholars in Education and Learning Psychology, wrote about the Distributed Cognition theory. Distributed Cognition draws upon many fields of theoretical development. These include the internet and computer-mediated communication, cultural-historical-activity, sociocultural educational psychology and cognitive science and technological advances. By introducing the Distributed Cognition theory, Perkins and Salomon have articulated the notions of 'shared knowledge'. Distributed Cognition describes the human cognitive condition which is distributed to other people through the use of tools when interaction happens. Processing of information is not just within one's head only but with many others. Learners find connections between different ideas, fields of study and basic concepts in learning. For example, Distributed Cognition explains that fostering connections between one another are needed in choosing what to learn, or being able to deal with the shifting nature of information. Learning involves many processes, people and methodology that one person learns from another person's action, speech or behaviour with or without guidance. Children, for example, learn from their parents, teachers or adults. Children also learn from other things around them, not just people such as the technological devices. In classrooms, children learn from teachers through guidance and lecture. The guidance provided by a teacher to a student would develop a bonding and lasting relationship. Distributed cognition is concerned with how activities are facilitated by richer engagement between individuals. Moreover, human activities also involve an assortment of technological artefacts found at home, at school or in the workplace. For example, technology tools such as: television, radio, GPS, portable computers, cell phones, handheld gadgets etc. are tools for distributing information, entertainment and knowledge. These knowledges are humans metacognitive reflections for reasoning and producing outcomes. Technology, artefacts, environment and social interactions are the sociocultural structures that distribute individuals' cognition. For example, human cognition generates solution for outcomes in thinking and processing the related functions of living endeavours. Salomon (1997) in his book; *Distributed Cognitions: Psychological and Educational Considerations* asserts that learning forms the Zone of

Proximal Development (ZPD)[107]. In adopting Vygotsky's theory of the ZPD, Salomon claims that learning stimulates different kinds of internal developmental processes. The developmental processes are operated via interactions between children and peers or other people and things within the environment. For example, he asserts that we are living in a world of people and things. People learn the good ones and avoid the bad ones, either things or people. People like to follow or imitate others. Imagine this scenario: In the centre of a town square, there are people selling popcorn or ice-creams. Not far from this centre, there are people selling ice-creams, newspapers and popcorn. These activities show that people are doing things that have been done before by many other people to earn a living, build contacts and socialise. Likewise, children learn to live, at homes and in schools, by being socialised. Lessons, activities and experiences make people learn physically and psychologically. Humans obtain sources from outside living and education and that give rise to experience. Salomon claims that we cannot ignore the activities that are transmitted from many people around us because these activities and experiences are shared by many people naturally. Experience does not happen in a vacuum, there are causes and outcomes outside of ourselves that give rise to experience and living. He writes[108]:

> *"View of culture begins with the assumption that human thought is basically both social and public - that its natural habitat is the house yard, the marketplace, and the town square."*
>
> (Salomon, 1997)

Simply put, Salomon describes that a culture is where people socialise by communicating between one another and thinking is shared when necessary at home, in the marketplace or in town squares.

[107] Salomon, G., 1997. *Distributed Cognitions: Psychological and Educational Considerations*, Cambridge University Press.
[108] Salomon, G., 1997. *Distributed Cognitions: Psychological and Educational Considerations*, Cambridge University Press.

Laurillard (2002) argues in a 'Conversational Framework' for the Higher Education[109], how a range of technological educational media could support learning. She claims that much of the work a lecturer has to do involves finding ways of conveying the abstract representative viewpoints of their subject to their students. Laurillard argues that academic knowledge consists of descriptions of the world and these descriptions represent a particular way of experiencing the world. She claims that the natural environment affords learning and learning is essentially situated within the specific context Thus, the psychology of an individual's learning is a situated cognitive process and thereby valuable. She mentioned Brown, et al.'s (1989a) arguments that knowledge has to be contextualised in such a way that we cannot separate knowledge to be learned from the situations in which it is used. Laurillard notes: "We have to use our knowledge in authentic activity, i.e. genuine application of the knowledge, which allows us to build an increasingly rich understanding of the tool itself and how it operates"[110]. Situated cognition makes the distinction in arguing that the environment should emulate the learning. For example, Laurillard argues for the potential of transforming the learning experience with learning technologies. She stresses the use of media such as TV, and the Web as resources of interactive media within University learning. Television and film are two examples of mediums that situate learning for the viewers. Laurillard claims, these two mediums are extremely capable of conveying a way of experiencing the world. They provide a sensational experience through dynamic sound and vision and use a number of technical devices to manipulate that experience.

This, relates to Perkins and Salomon (1988), whose use of these devices they called 'supplantation', in the sense that they supplant a cognitive process[111]. Perkins and Salomon argue that individuals transfer learning from one to another and share similar characteristics between each other. In these processes, one context enhances (positive transfer) or one undermines (negative transfer) transfer to another context i.e. impacts on performances or

[109] Laurillard, D., 2002. *Rethinking University Teaching – A Framework for the effective use of learning technologies,* London: Routledge/Falmer.
[110] Ibid, pp. 14.
[111] Perkins, D. N. and Salomon, G., 1988. Teaching for transfer. *Educational Leadership:* pp. 22-26.

materials[112]. For example, executing a task requires organization, planning and interaction with different people and artefacts. There are factors along the line towards the outcomes such as arranging people, venues, transport etc. The planning to get people to be involved requires emails, calls, and working papers. The selection of the venues for the event needs emails and quotation papers etc. and these create Talk or Dialogue. In elaborating distributed cognition concept, Rogers and Ellis (1994) wrote in a journal "Distributed Cognition: an alternative framework for analyzing and explaining collaborative working". They say [113]:

> *"Task execution also requires, in many instances, interactions with different artefacts. A common feature of many artefacts is the need to 'wait' for the completion of one operation before proceeding onto the next phase of a task; for example, waiting for a printing operation to cease while word-processing. There is a tendency in such situations to try and fill this 'empty space' - particularly when it is extended - with some other activity; for example, telephoning someone to arrange a sporting venue".*
>
> (Roger and Ellis, 1994, pp. 119-128)

Cultural - psychological development

In relating the above statements to the sociocultural settings of interaction, ZPD and knowledge and learning, we should reflect on the notions of Vygotsky's development theory. The most distinctive effect of Vygotsky development theory has led to a question of how humans change in the context of cultural and historical development. How do humans apprehend about the varied contexts and active changes in themselves? Vygotsky argued that humans in their development of higher functions, that is in the internalization of the processes of human cognition, have the capacity to externalise and share experiences with others about their understanding. Vygotsky calls the processes of interaction between the child and others an intermental psychological process. The process of internalization in an individual's psychological function includes their perception, attention, sensory-motor operations, memory and cognition. The intermental psychological process level becomes the basis for processes that

[112] Perkins, D. N. and Salomon, G., 1992. *Transfer of Learning; the International Encyclodaedia of Education*, 2nd Edition Oxford, England: Pergamon Press.
[113] Rogers, Y and Ellis, J., 1994. Distributed Cognition: an alternative framework for analyzing and explaining collaborative working Published in *Journal of Information Technology*, vol 9(2): pp. 119-128.

subsequently go on within the child. Note that the words 'inter' and 'intra' describe two different processes that are linked. Vygotsky argues that discussion, interaction and argument become internalised as the basis for intramental psychological reflection and logical reasoning and claims that learning and development are both interpersonal and intrapersonal psychological processes that are interceded by cultural tools. Vygotsky argues[114]:

> *"Any function in the child's cultural development appears twice on two planes. First it appears on the social plane and then on the psychological plane. First it appears between people as an interpsychological category and then within the child as an intrapsychological category... Internalization transforms the process itself and changes its structure and functions. Social relations or relations among people genetically underlie all higher functions and their relationships"* .
>
> (Cole, et al., 1978, p.128)

Vera Steiner and Ellen Souberman wrote about Vygotsky in the Afterword for the book *L.S. Vygotsky: Mind in Society - The development of higher Psychological Processes.* They contend that Vygotsky meant socially mediated attention develops in the children more independently and voluntarily than instruction. Children's attention will be used to classify his or her surroundings. Children are able to reconstruct their perception and free themselves from the perceived structure. With the help of speech, the child is able to master his or her attention. He or she then creates new structural centres through it. This means, children initiate their movement in achieving their goals through speech. With speech, their hands and minds work along the lines of the activity or object, they perceive, they think and they speak to produce results. They mentioned K. Koffka's (1924) statement '… a child has the capability to determine the "centre of gravity" of the perceptual field, thus evaluating the importance of the elements within it and singling out new "figures" to select and widen their activities' (Koffka, 1924, n.d)[115]. A child is able to describe the meaning of a picture given to him or her. For

[114] Cole, M., Steiner, V. J., Scribner, S. and Souberman, E., 1978. *L. S. Vygotsky: Mind in Society - The Development of Higher Psychological Processes,* Cambridge, Massachusetts and London, England: Harvard University Press.
[115] Koffka, K., 1924. *The Growth of the Mind,* London: Routledge and Kegan Paul.

example: a picture is comprised of many objects. A child is able to focus on the main object of the picture, he or she is also able to see the rest of the objects and create a story related to it.

Relating to this, Steiner and Souberman also quote Edward E. Berg. Berg claims that even though children needed lengthy nurturence and care taking, they are active in exploring in their own learning within the helpful contexts of the family and the community. Berg writes[116]:

> *"Just as the tools of labor change historically, so the tools of thinking change historically. And just as new tools of labor give rise to new social structures, new tools of thinking give rise to new mental structures. Traditionally, it was thought that such things as the family and the state always existed in more or less their present form. Likewise, one also tends to view the structure of the mind as something universal and eternal. To Vygotsky, however, both social structures and mental structures turn out to have very definite historical roots and are quite specific products of certain levels of tool development".*
>
> (Berg, pp. 45-46)

Academic learning as a way of experiencing the world

Laurillard (2002) maintains that teaching has to go beyond the specific experience that the teacher has[117]. The teacher needs to offer the best representation which will allows the learners to apply knowledge in different situations. She further maintains that knowledge has to be abstracted. Knowledge has to be represented formally and usefully so that the learners can see the point of an academic education. Laurillard claims that teaching subjects helps learners go beyond their experience, to use and reflect on it. As such, learners are able to change their perspective on that particular knowledge and apply it. As a result, learners are able to understand the meaning of that knowledge that they have gained and change the way they experience the world. Laurillard further points to the role of the teachers and institutions as the second –order level of reflecting, experiencing and sharing the available resources and knowledge. She explains: "Teaching may use the analogy of situated learning of the world, but

[116] Cole, M., Steiner, V. J., Scribner, S. and Souberman, E., 1978. *L. S. Vygotsky; Mind in Society - The Development of Higher Psychological Processes,* Cambridge, Massachusetts and London, England: Harvard University Press. Originally taken from Berg, E., "Vygotsky's Theory" pp. 45-46.

[117] Laurillard, D., 2002. *Rethinking University Teaching – A Framework for the effective use of learning technologies,* London: Routledge/Falmer.

must adapt it to the learning of descriptions of the world". Laurillard is concerned about the everyday knowledge that learners learn and experience. This knowledge, she claims, is located around them significantly. Knowledge happens when experienced. For example, we learn something, we experience and we understand. Laurillards maintains that teaching is useful when we experience, we analyze and we share the experience and knowledge we have with others.

On the relationship between psychology and education, Laurillard further claims that at present, cognitive psychology produces generalised principles and theories of learning. She indicates that the teacher must explain to the learners about what the subject means and its application to the real world. This can be done by relating his or her experience in teaching or personal life to the learners. Her arguments are in line with Roger Saljo's (1984) analysis of 'the written code' as a medium for learning. Saljo suggests 'observations on the problems of profiting from someone else's insight'[118]. As Saljo has put it:

> *"In scientific texts, new 'versions of the world', or fragments of such, are offered, and the act of learning through reading may thus be seen as containing an implicit commitment to transcend assumptions vis a vis reality for which we have a firm basis in terms of our own previous daily experiences. Our knowledge gained by personal experience and therefore 'true' in our everyday realm of life, may in our culture have to yield to an alternative mode of conceptualization that links with a scientific "version of the word"'*
>
> (Saljo, 1984)

Laurillard mentions Gibbons, et al.'s codified 'mode 1' – that is formal knowledge of traditional disciplines and 'mode 2' – informal, implicit knowledge created by communities in practice[119]. Gibbons argues that experiential knowledge is more valuable than formal knowledge. Laurillard contends that university teaching must address itself to experiential knowledge in order to maintain the way knowledge is actually used in society. Laurillard also

[118] Saljo, R., 1984. *'Learning from reading'*, in F. Marton, D. J. Hounsell and N.J. Entwistle (Eds.), *The Experience of Learning*, Edinburgh: Scottish Academic Press.
[119] Gibbons, M., Limoges, C., Nowotny, H., Schwartsmann, S., Scott, P. and Trow, M., 1994. *The New Production of Knowledge*, London: Sage.

mentions Brown and Duguid (1989), who reason that practical knowledge is highly contextualised, and the experiential knowledge is valued more than formal knowledge. Informal, experiential and situated knowledge, developed through communities of practice, becomes fully contextualised to the extent that it is no longer functional beyond that community[120]:

> *"The tasks undertaken by communities of practice develop particular, local, and highly specialised knowledge within the community... Communities develop their own distinct criteria for what counts as evidence... The division of labor produces the division of knowledge... Within communities, producing, warranting, and propagating knowledge is almost indivisible... Hence, the knowledge produced doesn't turn readily into something with exchange value or use value elsewhere."*
>
> (Brown and Duguid, 1998, p. 40)

Thus, Laurillard concludes the argument against the primacy of formal knowledge by Gibbons, et al. and by Brown and Duguid. Laurillard comes full circle to an acknowledgement that without the process of decontextualization and formalization, knowledge remains situated and incommunicable. By summarizing these two processes, Laurillard claims that academic knowledge must address both aspects; that is to create the situation that makes learners embrace the experience and formal knowledge of traditional disciplines. For Laurillard, teaching must emulate the success of everyday learning of real-world activity or situated knowledge.

Conclusion

The statements made by the scholars provide an explicit argument about children's socialcultural learning and psychological development. Children can respond in ways of distinguishing things, philosophy, emotion, and conversation. We should analyze further Bruner's statement that thought in humans is divided into two distinctive modes, narrative and paradigmatic. These two modes have given significant added value to children's cognitive learning development in the sociocultural settings of socializing and learning attainments. The

[120] Brown, S. J. and Duguid, P., 1998. 'Organising knowledge', *California Management Review* (3): pp. 40.

paradigmatic mode explains the extension of children's hands and the use of social tools to accomplish their task using things around them in school or outside school. The narrative mode also explains children's cognitive processes of educational achievements in thinking and organizing knowledge. Thus, the importance of a chronological, action-oriented, detail-driven thought in children's social interaction and engagement with society must be acknowledged. That said, this study is analyzing the importance of children's Talk or Dialogue through the use of interactive mobile technology devices. Does the Talk or Dialogue that children have created signify the modes that Bruner claims?

Alexander's findings on classroom learning in five countries have given us awareness of the importance of distinguishing 'talk' as a unique pedagogical approach to be applied in the classroom for children's cognitive development. Cognitive development, as we understand, is the process of humans discovering how to learn; a term that scholars have identified as Distributed Cognition. Distributed Cognition is argued as being a form of human cognition that develops when interaction happens amongst people, environment, social tools and many more. These arguments are in line with Vygotsky. Vygotsky emphasised the human's psychological intermental and intramental levels that occur within social interaction, speech and cognitive learning thanks to the use of social tools, play and response. Vygotsky asserts that speech, dialogue and children's intellectual development are rooted in their sociocultural and historical behaviour. This has been argued extensively by Laurillard using the conversational framework that she adopts from many scholars including Vygotsky. She recognised that speech, psychological learning and cognition are embraced by humans for knowledge and everyday learning of the world. Thus, this section values the scholars' arguments regarding the possibilities of children's Talk or Dialogue in contributing to their cognitive learning via interactive mobile media technologies. In the next section, this study introduces the theory of children's psychological development of higher function by Vygotsky. This is important to align with the significance of Talk or Dialogue in human psychological development, as well as the use of the social tools, social interaction and cognitive development as Vygotsky has argued.

Sec III - The development of higher psychological processes in children

The development of higher psychological processes in children

L.S. Vygotsky

Introduction

The previous section analyzed the sociocultural theory of learning and dialogue in children's educational theory and cognitive development. We acknowledged Bruner's contribution to children's learning development through cultural participation. We also touched on Mercer and Littleton's claim that all kinds of dialogue must be appreciated in all kinds of settings. The participants must have some shared understanding of how to make the interaction happen. The Dialogue approach to learning in the classrooms has made children think about compatible ideas of what is appropriate to say, not to say and do. We learned that Alexander observed children's learning in the classroom in many countries. Alexander stressed that children's cognitive development depends substantially on the contexts of language they used in the classroom.

In this section, I examine the work of Vygotsky. In the book *Mind in Society, the development of higher psychological processes* (1978), Cole, et al. wrote that Vygotsky figured highly in American psychology since the publication of his monograph *Thought and Language* in 1962[121]. Vygotsky was recognised as an early neo-behaviourist in cognitive development. Here, I have selected his work on ZPD, his experimental methods, children's cognitive learning development, children's higher psychological processes and the role of play in children's development and social interaction. All these works are important to highlight many more topics in examining the Dialogue and the development of children's cognitive intellectual thinking. Many of these works were compiled and edited by M. Cole, V. John-Steiner, S. Scribner and E. Souberman in the book *L. S. Vygotsky–Mind in Society: The Development of Higher Psychological Processes*, (1978)[122]. This book is especially useful to examine children's perception, their attention, sensory-motor operations, memory, the use of social tools, social

[121] Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., 1978. *L.S. Vygotsky, Mind in Society: the Development of higher Psychological Processes*, Editors' Preface, Cambridge MA: Harvard University Press.
[122] Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., 1978. *L.S. Vygotsky, Mind in Society: the development of Higher Psychological Processes*, Cambridge MA: Harvard University Press.

interactions and cognitive development which will be discussed in turn throughout the thesis. These areas are significant to this study's contribution to knowledge for children's intellectual development through the use of Talk or Dialogue with technological devices for their learning accomplishments.

Vygotsky's experimental method

Vygotsky's experiments focused on the process of observation rather than conventional experiments on performance. This describes that the principle of his research does not stem from a purely methodological critique of established experimental practices. Instead, his experiments developed from theories about the nature of higher psychological processes and the scientific explanation in psychology theory. He maintains that higher psychological processes are raised and experienced through changes in the course of learning and development. Vygotsky claims that children can determine their origin and then map their own lives. His experiments observed children's growth through levels of developmental processes. He emphasised in his writing that any experiments to be conducted for the development of children's higher psychological processes must be observed. The investigator could create processes of observation that telescope the actual course of development. The word telescope means notes are to be taken in details on their every actions. The observation requires detailed analysis of the activity such as by observing the children's movement or reaction. He emphasised that the observation and the results need to be recorded clearly throughout the processes. If needed, the observation must be conducted repeatedly in order to have accurate concrete outcomes. He terms the observations the experimental-genetic. The experimental-genetic is "telescope the actual course of development of a given function" [123]. He maintains that the experimenter must provide the maximum chance for the subject to employ a variety of activities that can be observed. He coined the term experimental-genetic with Heinz Werner – an outstanding contemporary in the field of the developmental, comparative approach to

[123] Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., 1978. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, pp. 12, Cambridge MA: Harvard University Press.

psychology. For example, in Vygotsky's experiment to discover the elementary beginnings of new skills, he focuses on centralizing some questions such as: what are the children doing and how are they trying to satisfy task demands? By doing this, Vygotsky intends to convey the observation of the higher forms of human behaviour in children. Children, Vygotsky argued, are active in manipulating the objects or visual fields of their perception. When children perceive or experience something, they modify the visual fields of the perception by singling out particular objects. Then, their attention surfaces together concurrently which create the stimulus reaction with the object. The stimulus reaction then forms responses to their next actions. More specifically, human beings adapt the stimulus situation and their response to actions. The stimulus situation is the reactions or activities initiated by a child with aid from outside (such as social tools) to control their actions. So, a child's reaction or activities are driven by a process of stimulation from the environment. Vygotsky terms the stimulus and response process as "mediating", a structure of the activity which produced children's behaviour. With Vygotsky's experimental methods, several implications follow from his theoretical approaches and methods of experimentation on children's behaviour for qualitative as well as quantitative research. Cole and Scribner are two outstanding scholars who wrote about Vygotsky. They argue that the investigator who is taking part in this sort of experiment has to make the conclusions in their measurements. They have to decide about whether or not and to what extent, young children should engage in organizing activities as a memory strategy[124].

The 'zone of proximal development' (ZPD)

Vygotsky claims that concepts of social learning and the 'zone of proximal development' (ZPD) are linked and mutually support children's cognitive development processes. Vygotsky wrote [125],

[124] Ibid, pp. 12-13.
[125] Ibid, pp. 86.

"The ZPD is the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers".

(Cole, et al. 1978, p. 86)

Vygotsky asserts that children's cognitive development requires engagement through the use of spoken language with many people in their society and culture. He emphasises that interaction is critical in the process of children's cognitive development. In ZPD concepts, children can be taught through imitation, their intellect is developed because they have adults as guides. For example, children have the ability to imitate a much more collective activity or actions that are beyond their own capabilities, under an adult's guidance. With guidance, children can solve more difficult problems independently subsequently. Hence, Vygotsky termed the ZPD as an approach to enhancing children's learning development. Children learn from peers, adults or parents where they live; through observations, perception and experiences at home or in schools. The processes of children's development require involvement and support of many others such as parents, teachers, peers and many more.

The ZPD is a concept of children's learning development which involves people, society and the use of social tools around them. With ZPD, children have the ability in determining their own action, knowledge and understanding. These abilities Vygotsky argues, are the "higher psychological processes". The higher psychological process is referring to the development of cognitive thinking with the use of social tools in psychological activity[126]. In Vygotsky's writings, the higher psychological processes also referred to children's higher behaviour or the higher psychological functions of perception, attention, sensory motor-operations and memory. Basically Vygotsky explains that children are able to broaden their activities with the use of social tools. The social tools are language and other sign systems namely writing, symbols and number systems. These tools are children's activity tools in

[126] Ibid, pp. 55.

Vygotsky's era. In this thesis, social tools refer to many other things namely: operating technological gadgets, playing with technological devices, conventional playing toys and many more. Fundamentally, Vygotsky argued that the use of social tools or any artificial means is a transition process that develops children's cognitive learning processes. For example, the use of tools limitlessly broadens the range of activities in children within which children's cognitive intellectual thinking may operate. More importantly, Vygotsky claims that the higher psychological processes in children implicate the societal context in the development of human behaviour. Behaviour means the actions or reactions of humans, usually in relation to the environment. Vygotsky asserts that children are able to establish the simple meaning of what they encounter. They are also able to construct complex forms of knowledge and understanding. For example, Vygotsky proposed that children's cognitive development was a constructive process where it is not the child alone who constructs knowledge but also the society where the child lives. Vygotsky emphasises that social context influences not only children's attitudes and beliefs, but how and what they do. Learning, according to Vygotsky, depends on mediation by social, cultural and institutional processes[127]. Vygotsky argued that children interact with parents, peers and adults every day. They learn from their own experiences at home, outside of the home and in schools. So, children develop their understanding through a natural process of the social interactions from these environments. They use the social tools such as pencils or pens for writing, books for reading, and toys for playing with their parents, siblings and friends. These activities are children's core social process. For Vygotsky, rather than being mainly based on direct encounters with the physical world, the construction of knowledge and understanding is a naturally social process and activity. That said, the higher psychological processes are constructive in children, reflecting societal context. Thus, through social interactions with parents, teachers, peers or any members of society, the child will encounter learning processes and how to interpret the world**.**

[127] Ibid, pp. 52-57.

Intellectual and cognitive psychology in a social setting

Working alongside his student, Alexander Romanovich Luria (1976), Vygotsky initiated studies on the cognitive consequences of vast social change and the special impact of schooling[128]. Vygotsky was concerned about many aspects of the social and educational transformations brought about by the October Revolution in 1917 in the Soviet Union. These changes affected many contemporary educators in the Soviet Union. In an essay written by Alexiei Nikolaevich Leontiev and Alexander Romanovich Luria (1968), they describe a summary of Vygotsky's psychological ideas about classroom education[129]:

> *"School education is qualitatively different from education in the broad sense. At school the child is faced with a particular task: to grasp the basis of scientific studies, i.e., a system of scientific conceptions. In the process of school education the child starts off from what have become his own complex generalizations and significances; but he does not so much proceed from them, as proceed onto a new path together with them, onto the path of intellectual analysis, comparison, unification, and establishment of logical relations. He reasons, following the explanations given to him and then reproducing new, for him, logical operations of transition from one generalization to other generalizations. The early concepts that have been built into the child in the process of living and which were assisted by rapport with his social environment (Vygotsky called "everyday" or "spontaneous" concepts, spontaneous in the sense that they are formed aside from any process specially aimed at mastering them) have now switched to a new process, to a new special cognitive relationship to the world, and so in this process the child's concepts are transformed and their structure changes. In the development of a child's consciousness the grasping of the bases of a science-system of concepts now takes the lead".*
>
> (Leontiev and Luria, 1968)

[128] Luria, A.R., 1976. *Cognitive Development: Its Cultural and Social Foundations,* Cambridge: Harvard University Press.

[129] Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., 1978. *L.S. Vygotsky, Mind in Society: the development of higher psychological processes, Afterword.* Cambridge MA: Harvard University Press. Originally from Leontiev A. N. and Luria, A.R., 1968. *"The Psychological Ideas of L.S. Vygotsky*," in Wolman, B.B., ed., *Historical Roots of Contemporary Psychology,* pp. 338-367. New York: Harper and Row.

The quotation above shows how Vygotsky interpreted the understanding of classroom learning. Vygotsky claims that learning is a profound social process. He stresses the ability of teaching processes to make learners grasp the content of learning effectively such as intellectual analysis, comparison, unification and establishment of logical relations. Thus, learners are able to reason, explain and reproduce new things. Vygotsky is concerned about the plain exposure of students' learning; through oral lectures. This type of exposure is limited to students by teachers' guidance and also collaboration works with peers. The above findings imply that Vygotsky emphasises language and dialogue. Vygotsky views learning as a profoundly social process, he stresses that Dialogue plays many roles in instruction and mediated cognitive growth[130]. Therefore, he emphasises the roles of psychologists and educators to collaborate on the analysis of insightful internal developmental processes in learning. The teaching that stimulates insightful development and subsequent learning, provides advancement to the learner by guiding them to understand socially-elaborated human knowledge and cognitive development. Simply put, it is the societal context of learning experiences and involvement in them that contribute to cognitive development. Cognitive development is something that learners must seek and create strategies in learning for their own benefit in order to augment their own reflection and internalization. Vygotsky named the classroom learning process "actual developmental levels". Actual developmental levels show a genuine learning process between teachers and learners. A spontaneous teaching and learning approach needs to use Dialogue or Talk between the teacher and children. For example, discussion between teachers and children provides valuable experience to both of them. The teacher starts the lesson by talking about the topic to be taught and the children are asked to respond, discuss and voice opinions. Teachers get the response on the spot and guidance can be given immediately. This process of learning is not only highlighted by Vygotsky, Paolo Freire (1970) also applied the same principle of Dialogue in classroom learning. Freire's principle application of knowledge argues that learning is applied to educational methods according to the specific historical and

[130] Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., 1978. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes, Afterword.* Cambridge MA: Harvard University Press.

cultural setting in which students lived.[131] Agreeing with Vygotsky, Freire also claimed that children combine what teachers introduced in instructional settings and their own "spontaneous" concepts that they have developed through social interaction[132].

Children and their psychological learning development

Vygotsky argued that human beings change themselves in the varied context of culture and history. In this context, Vygotsky explains that children are able to differentiate between good and bad, they are able to evaluate positive and negative outcomes. Vygotsky asserts that the processes of interaction between the child and others are their intermental level. The intermental ability occurs through interaction with people. This ability becomes the basis for many more processes that subsequently go on within the child. For example, the child's social interaction with adults and more capable peers become the basis for their intramental reflection and logical reasoning. However, in contrast, the intramental ability exists within the child, processing voluntary attention to their logical memory and to the formation of concepts. All these higher functions originate from the child's actual relations between human individuals (Cole, et al 1978)[133]. Vygotsky asserts that the process of learning and development in the child are interpersonal and intrapersonal processes, which are mediated by cultural tools.

Conclusion

Vygotsky attempted to characterise the interpersonal interactions that take place in learning settings. He also sought to develop a 'cultural psychology' in a learning environment, within which learning is seen to depend upon mediation by social, cultural, technical and institutional processes at many levels. Nevertheless, this thesis values Vygotsky's contribution in underpinning the significance of children's cognitive intellectual thinking, psychological development and cultural learning context in Malaysia. This contribution is huge to children - the future generations of Malaysia and the development of the country's economic and social

[131] Freire, P., 1970. *Pedagogy of the Oppressed.* New York: Continuum Books.
[132] Freire, P., 1970. *Pedagogy of the Oppressed*. New York: Seabury.
[133] Cole, M. John-Steiner, V., Scribner, S. and Souberman, E., 1978. *L. S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes,* Cambridge MA: Harvard University Press.

wellbeing. These areas are still lacking in Malaysia's educational research. Whereas outside Malaysia, especially in Europe and America, Vygotsky's works continued and continues to influence research in a wide variety of basic and applied areas related to cognitive processes and learning developments. His aforementioned studies have been published in greater detail by his students. These include: Mind in Society, Thought and Language, Development of Higher Mental Functions, Psychology and Localization of Functions, Thought and Speech, Thought in Schizophrenia, The Psychology of Arts, etc. This research is hoped to potentially fill the gaps in these important fields in children's learning development.

Section IV - Speech and tools in children's development and their educational implications

Speech and tools in children's development and their educational implications

Introduction

The previous literature review highlighted the development of higher psychological processes in children by Vygotsky. Vygotsky included the role played by the adults, teachers, peers and parents in helping children learn. Children have the ability to imitate a greater collective action beyond their own capabilities under adult guidance. We also recognised that children's intellectual learning is affected by the cognitive consequences of vast social change and the special impact of schooling. Vygotsky emphasised the value of dialogue and the varied roles that language plays in instruction and mediated cognitive growth. The section also made us understand that children's cognitive psychology developed in a social setting. Thus, all the processes of social interaction, adult guidance and cognitive growth change children's interpersonal and intrapersonal psychological development.

This section discusses Vygotsky's notion of speech and the use of tools. Vygotsky claims that the sense-making resources of society are available to children through their participation in the cultural life of the community, specifically their use of artefacts, technologies and rituals in the company of others. These processes of interaction and the use of social tools help to develop children's cognitive thinking and understanding.

Speech and tools in Children's Development

Vygotsky argues that the processes of social interaction, communication and the use of tools between the child and the community where they live develops their mental resources. Mental resources is the knowledge that children have gained and their ability to process it for their next endeavour. The notion of a cultural tool refers not only to physical tools and artefacts but also extends to symbolic tools elaborated within a culture. According to Vygotsky, prior to mastering their own behaviour, children begin to master their surroundings with the help of speech. The creation of these unique human forms of behaviour eventually produces an intellectually productive work: the specifically human way that people use the tools. In his

observations of children, he claims that children not only *act* in attempting to achieve a goal but also *speak*. Act here is the action that the child accomplished during the observation when he or she is speaking. These two words are highlighted in italics to show that there were two actions that happened spontaneously when a child was attempting to solve a problem. Their speech arises spontaneously and continues without interruption throughout the experiment. For example, Vygotsky conducted an experiment with his collaborator, R. E. Levina (1938), on children aged four and five-years-old where they had to obtain a piece of candy from a cupboard. The candy was placed out of reach of the child in order that the child could not obtain it easily. He claims that the child obtained the candy by producing "egocentric" speech during the attempts. The speech manifested itself as part of the child's active striving. Levina wrote[134]:

"A girl was asked to get candy from a cupboard with a stool and a stick. (Stands on a stool, quietly looking, feeling along a shelf with a stick). 'On the stool.' (Glances at experimenter. Puts stick in other hand.) 'Is that really the candy?' (Hesitates.) 'Can I get it from that other stool, stand and get it.' (Gets second stool.) 'No, that doesn't get it. I could use the stick.' (take stick, knocks at the candy.) 'It will move now.' (Knocks candy.) 'It moved, I couldn't get it with the stool, but the, but the stick worked.'"

(Levina, 1938, pp. 105-115)

Levina argues that speech not only accompanies children's practical activity, but also plays a specific role in carrying it out[135]. Levina states that the experiment has demonstrated two important facts: Firstly, in attaining the goal, speech to a child is as important as the role of action. They speak about what they are doing, thus speech and action go hand in hand. At the same time, the complex psychological functions of perception, sensory-motor-operations,

[134] Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., 1978. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press. See Levina, R.E. for Vygotsky's ideas on the planning role of speech in children, *Voprosi Psikhologii, 14.,* 1938: pp. 105-115. Although Levina made these observations in the late 1920s, they remain unpublished except for this brief explication.
[135] Ibid, p. 25. Originally from R.E. Levina, for Vygotsky's ideas on the planning role of speech in children, *Voprosi Psikhologii, 14.*, 1938: pp. 105-115. Although Levina made these observations in the late 1920s, they remain unpublished except for this brief explication.

memory and attention direct the child toward solving the problem at hand. Secondly, in solving the problem, a child voices-out speech that would direct them to the solution. The more difficulties there are, the more a child depends on speech. Every so often, speech turns out to be so important that younger children cannot accomplish the given task without speaking.

Levina concludes that with the help of speech, and the use of their eyes and hands, children solve practical tasks. The unity of children's complex psychological functions of perception, speech and action showed the process of internalization of the visual field which establishes the forms of human behaviour. Thus, children include stimuli such as the tools around them and use words to create specific plans, solve problems and execute future actions.

Educational Implications

Vygotsky placed school instruction and learning in advance of children's cognitive development. Advance in the sense that children are faced with tasks such as scientific studies, conceptions and the broad sense of educational differences. In schools, children are guided by teachers and more capable peers. The interaction between them creates a "zone of proximal development" because in both contexts, children need social skills and knowledge which they accrue with the help of peers and teachers. For example, in school, children are able to take both the content of what is being taught as well as the role of the teachers. Vygotsky emphasises that teachers are specially trained adults who teach children with care and are focused on the lesson plan. In school, children learn and proceed onto something new such as intellectual analysis, comparison, unification, cooperation and organization of logical relations. A child relates new logical relationships of what he or she listens to from teachers' explanation. Any difficult concepts of learning faced by children are assisted by a rapport with their social environment. The learning process is "everyday" or is a "spontaneous" concept. The child learns something new separate to what they have already known. Consequently, the child spontaneously changes to a new process of internalizing the cognitive relationship to the world. The child is transformed, grasps the basis of learning concepts and lead their lives educatedly.

Conclusion

Children resolve problems with the use of the tools they have. They also search for alternative solutions by referring to the people nearby. More importantly, in solving problems, children speak. Their speech is spontaneous and directed towards the problems. Speech accompanies their action, directed to verbal appeals on the object of attention to achieve their desired goals. The more complex the task is, the more speech is demanded.

Vygotsky's findings in children's speech and the use of tools strengthened this study. It demonstrates the logic of children's higher psychological functions of intermental and intramental processes by using the tools in mediating their activity. Their behaviour of active modification and the stimulus situation formed as part of the response process. This is an important area to be examined in this study - the Dialogue or Talk with the use of technological devices in children. How about children's text, Talk or Dialogue through the use of the interactive mobile media? Does text, Talk or Dialogue through the medium of technological devices develop learning concepts in schools? Is the Malaysian educational department aware of the notions of speech that enhance children's cognitive development? Hence, what type of strategies in teaching and learning should Malaysia look into now to boost children's cognitive learning.

Section V - A Dialogic approach to teaching and learning

A Dialogic approach to teaching and learning

Diana Laurillard

Introduction

The previous section explained the role of speech and tools in children's development and their educational implications according to Vygotsky. We understand that children solve practical tasks with the help of speech, eyes and hands. We recognised that children's complex psychological functions of perception, speech and action are a united process. Vygotsky claimed that this unity is part of the way human behaviour internalises perception. The child is able to include stimuli by using words and the tools available around them to create specific plans, solve problems and execute future actions. We were also made aware of the concept of ZPD that causes educational implications in children's lives. This concept enhances children's thinking ability for internalizing their cognitive relationship to the world. They proceed onto something new such as intellectual analysis, comparison, alliance and organization of logical relationships.

In this section, we examine the importance of a conversational approach to teaching and learning by Laurillard, (2008). This framework is used to understand the degree to which using new technology and media uphold the learning context. Although her framework is for the higher level of education, the explicit social learning approach with the use of tools in media technology and conversation relates closely to this study. Her work concentrates on the meaning of clear discussion on the learning topics and understanding how a student learns. In this way, her work is suitable for this study in emphasizing the clear discussion of Talk or Dialogue approaches in the classroom between the children and the teacher. In turn, we will explore the work of many other scholars including that of Duffy, Bruns, Ramsden, Pask, Brown, Collins, Duguid and Saljo which discuss the relationships of dialogue and learning.

The Conversational Framework

The 'Conversational Framework' is a mode of learning operations with a range of educational media. These include print, audio-visual, computer-based learning, teleconferencing and Web access. Laurillard asserts that the learning technologies must attain their full potential in order to generate a better learning experience for learners. Thus, to examine which technologies are available and take advantage of them is crucial. Due to that, she claims that the Conversational Framework has put into place a better learning strategy for teaching and learning with media technologies. In her book, *Rethinking University Teaching 2nd Edition: A framework for the effective use of learning technologies* (2008), Laurillard emphasises the value of a learning framework which highlights the Dialogic form of the learning and teaching process[136]. The framework supports various media forms such as the narrative, interactive, communicative, adaptive and productive. She described that the narrative media represent print media, TV, video and DVD. Laurillard argues that these media are attentive to the learner. although they are non-interactive. Books have been established as the supreme educational medium despite their non-interactive form. Laurillard claims that students engage in them during the learning process and make what they can of them. The traditional media, such as books, lectures, prints, films and television programmes are all good narrative forms of educational methods. The structure is linear dynamic, it links the components to each other and consistently across the world. The content of these media may be causal, temporal and motivational for the students. These are inclusive of the productive media such as essays, products, animations and models which are articulated and expressing the learners' learning experience[137].

By interactive media, Laurillard means online libraries, CDs, DVDs and Web resources which are suitable for investigation and exploration. This media provides the nature of accessibility and user control as the most important features in terms of pedagogy. Users have the ability to openly access any part of the material in any sequence. The material is as user-

[136] Laurillard, D., 2008. *Rethinking University Teaching 2nd Edition – A framework for the effective use of learning technologies,* London: Routledge/Falmer.
[137] Ibid. pp. 89-90.

responsive as it is interactive which allows for users to explore and experience the content. Users can navigate and select the content at will in the form of text, graphics, audio, video or any combination (Laurillard 2008, p.107)[138]. Interactive media provide different types of learner control such as the sequence of content, the type of learning activity and the input to content questions. Laurillard mentions Barker's, (1994) 'basic principle of interactivity'. Here, there are two dynamic processes a student and a computer program work through successive messages sent between them. That is, each receiver undergoes a change of condition on receipt of the message and generates a new message. But Laurillard is more concerned with the courseware design that must establish principles of interactivity to give a detailed analysis of the nature of the medium and students' experience of the interaction. Laurillard argues about hypermedia, the trail of information retrieval system for a more dynamic form of associating to human memory. She highlights the information processing theory of cognition. She quotes Vannevar Bush's (1994) idea about the hypertext tool that was designed to act as an aid to natural human thinking. For example, what the user will do when building their system so that it makes personal retrieval easier.

Laurillard argues that learning must be done as an iterative dialogue, which must be discursive, adaptive, interactive and reflective between the teacher and the student. She asserts that learning must be made at the level of descriptions of the topic and at the level of actions within related tasks. Laurillard emphasises the conversation between teacher and student that must be done clearly in explaining the lesson's topic. The student then can question and discuss any unclear outcomes with the teacher. Besides, teaching is also a representation of teacher and student interaction through some mediums. The conversation is also effective with the Communications media, Laurillard asserts that online seminars and conferences will make the learners discuss and debate experience on a topic or task. For example, a face to face conference talk through a web camera, or with more than two parties that may utilise a

[138] Laurillard, D., 2002. *Rethinking University Teaching – A framework for the effective use of learning technologies,* London: Routledge/Falmer.

combination of several media. Through some mediums, the classroom conventional style of teacher and student discussions can be done similarly.

Correspondingly, Laurillard mentioned David A. Kolb's (1984) 'learning cycle' that posits learning takes place through an iterative cycle of experience and feedback. Learning reflected in revised action[139]. Kolb argues for an Experiential Learning Theory (ELT). The theory discussed the learning process of adult development that emphasised the role of experienced cognitions over affect and behavioural learning theories. Originally Kolb's work (1984) defines learning as "the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience" (Kolb, 1984, p.41). The term "experiential" is adopted from the works of John Dewey's philosophical pragmatism (1990)[140], Kurt Lewin's social psychology (1999)[141], and Jean Piaget's cognitive-developmental genetic epistemology (1959). Epistemology is the philosophy concerned with nature and logic. Laurillard claims that these three works formed a unique perspective on learning and development.

Similarly, Gordon Pask (1976) formalised the concept of learning as a conversation. This theory highlights the separation of 'description' and 'model-building behaviours'. Pask emphasises the teaching and learning processes as an iterative conversation. He claims that teaching and learning is understood as 'determined by two levels of agreement' (Pask, 1976, pp.12-25)[142] which are descriptions and model-building behaviours. In relating her points to Kolb and Pask, Laurillard is concerned about the processes of teaching and learning rather than just the product. She claims that although academicians should maintain traditional academic values; teach to provide knowledge, they should seek changes in the means of lecturing. On the other hand, the learner should engage themselves with their own ideas as well. She further claimed that educational institutions should provide a productive methodology so that the

[139] Kolb, D. A., 1984. *Experiential Learning: Experience as the Source of Learning and Development,* Englewood Cliffs, NJ: Prentice Hall.
[140] Hickman, L. A., 1990. *John Dewey's Pragmatic Philosophy,* First Midland Book Edition.
[141] Lewin, K., 1939. Field theory and experiment in social psychology: concepts and methods. *American Journal of Sociology,* JSTOR
[142] Pask, G., 1976. 'Conversational techniques in the study and practice of education', *British Journal of Educational Psychology,* 46: pp. 12-25.

teachers who may have only limited knowledge of how to teach will get the help they need to improve. For example, teachers should be provided with in-service training from time to time. Through the educational system, the university should support both teachers and learners in an approach to learning and teaching that fits academic values. Thus the academician must decide what kind of teaching approach or transformation is worth being formed using the available sources. For example, arguments should be assessed critically, knowledge should be integrated and compiled with the learning requirements such as to fulfil students learning facility, technology and resources.

Teaching as mediating learning

Laurillard highlights the importance of the academic goal rather than just imparting knowledge. As a teacher, the skills of "knowing" the knowledge to be taught is crucial. She stresses the institution to develop an approach that has a higher aim for learners and teachers. For example, Laurillard quoted from Ramsden: "the aim of teaching is simple: it is to make student learning possible" (Ramsden, 1992, p.5) [143]. Laurillard emphasises the engagement of interaction and conversation between the teacher and student. She quoted Paul Ramsden's statement that teaching is a sort of conversation[144]. Ramsden claims that teaching must focus on rational planning and logical sequencing. Ramsden is concerned with the teaching approach that has to make a change. Laurillard however, stresses that this includes changes in practice that will make a true difference to students. For example, she argues the point that to make student learning possible is to know something about student learning. This can be done by producing a series of activities and developing skills and capabilities as much as formal knowledge. Not just the process but more importantly the approach of how a student gets, and ends up knowing, the knowledge [145]. Laurillard characterised 'mediating learning' as involving constructing the environment and learning descriptions of the world. Correspondingly, she wrote about Vygotsky's concept of spontaneity.

[143] Ramsden, P., 1992. *Learning to teach in Higher Education,* London: Routledge.
[144] Ramsden, P., 1992. *Learning to Teach in Higher Education,* London: Routledge.
[145] Laurillard, D., 2008. *Rethinking University Teaching – A framework for the effective use of learning technologies,* 2nd edition, pp. 12, London: Routledge/Falmer.

Vygotsky (1962) argues that the spontaneous concept is a face-to-face meeting with a concrete situation. A scientific concept is a 'mediated' attitude towards its object[146]. Vygotsky drew the same kind of distinction between the spontaneous concept of everyday learning and the scientific concept of the classroom[147]. Vygotsky denotes a connection of learning between two or more people that develop cognitive thinking. To put her argument clearly, Laurillard underlines learning as imparted knowledge. Laurillard argues that knowledge has a contextualised character; academicians must put together the knowledge to be learned from the situations in which it is used[148]. For example, Brown, et al. (1989a) claim that situations that co-produce knowledge through activity, learning and cognition are essentially situated. Brown, et al. says[149]:

"Situations might be said to co-produce knowledge through activity. Learning and cognition, it is now argued, are fundamentally situated".

(Brown, et al., 1989a, p. 32)

Academicians must discard any notions that a concept is some sort of abstract or self-contained substance. In its place, conceptual knowledge is similar to a set of tools. Academics have to use their knowledge in authentic activity i.e. genuine application of the knowledge which allows for building a rich understanding of the tools and their operation (Brown, et al.,1989a) [150]. Thus, Laurillard claims that algorithms, routines and decontextualised definitions which are the stuff of many institutional courses should be ditched because the student cannot apply them. She argues[151]:

"We have to help students not just to perform the procedure, but also to stand back from it and see why it is necessary, where it is fitted and where it is not, distinguish situations where

[146] Vygotsky, L.S., 1962. *Thought and Language,* pp. 108, Cambridge, MA: MIT Press.
[147] Laurillard, D., 2008. *Rethinking University Teaching – A Framework for the effective use of learning technologies,* 2nd Edition. London: Routledge/Falmer. Vygotsky, L., 1962. *Thought and Language,* pp. 108, Cambridge, MA:MIT Press.
[148] Ibid. pp. 13-16.
[149] Brown, J. S., Collins, A. and Duguid, P., 1989a. 'Situated Cognition and the Culture of Learning', *Educational Researcher,* 18 (1): pp. 32-42.
[150] Ibid. pp. 5.
[151] Laurillard, D., 2008. *Rethinking University Teaching 2nd Edition, A conversational framework for the effective use of learning technologies.* London and New York, Routledge/Falmer, Taylor & Francis Group.

it is needed from those where it is not, example: carry out the authentic activities of the subject expert".

(Laurillard, 2008, p.15)

Learning as situated cognition

Laurillard emphasises that learning must be situated in the domain of its objective. That is, teaching must go beyond the specific experience and propose the symbolic representation that gives learners the ability to use their knowledge in an unfamiliar situation[152]. Laurillard argues that the academician must understand and apply teaching about the way we look at the world. Learning is not just about the surface of the subject but deeper. By adopting Brown, et al., she underlines the situated character of learning. She stresses that academics could expand the ways of creating what students want to learn. She asserts the concept of authenticity of learning which defines the engagement between teachers and students. So students will explore the relationships between real world activities and the symbolic descriptions in the task given. This concept of 'authentic activity' is valuable because of its implication for task relations. She further maintains that education should be represented formally to make it understood and more useful. Knowledge has to be abstracted. The idea of situated cognition is to go through an example in detail and analyze the extent to which it provides an adequate account of academic learning. Thus, these arguments reflect the adaptive media that she highlights. This includes laboratory experiments, field trips, simulation of task experiments and practice in the classroom.

Conclusion

According to Laurillard, teaching mediates learning and is a rhetorical activity which allows students to acquire knowledge from people experiencing the world – teacher for children's understandings. In the teaching and learning environment, both teacher and learner have to be taught with experience and formal knowledge. That said, teaching and learning do not just

[152] Ibid. pp. 16.

impart decontextualised knowledge, but must follow everyday learning or situated knowledge in real-world activities.

Laurillard's argument and description of the Conversational Framework has helped show the potential of communication, media, technologies, situated knowledge, experiential knowledge etc. This section does not mention much on media and technology from Laurillard because her framework is dedicated to the higher levels of classrooms. This section cites her arguments to relate to the use of clear conversation between teachers and learners in the teaching and learning process. Her ideas of leveraging conversation in the classroom should be mindful since there were voices of learners in need. Learners in need for learning in the modern, technologically-advanced world. Her methodologies in the Conversational Framework produced different kinds of data that will operate at different levels of the teaching process in the classroom with technology devices. Laurillard also underlines the importance of institutions to emphasise the academic goals for learners and teachers.

This thesis is to make children experience the world in the classroom with teachers. Especially, with the use of Talk or Dialogue teaching and learning approaches between teachers and children that implemented experiential learning and situated cognition. This thesis will be looking at how teachers can highlight these aspects of teaching that use Talk or Dialogue. This is the area that this thesis is hoping to propose. Hence, this study hopes to contribute to the Malaysian Education System in terms of at least granting significance to Talk or Dialogue teaching and learning with technology devices in children. Ultimately, to achieve the academic goals of nurturing Malaysian children as intellectual individuals.

Section VI - Understanding digital culture and its application in the classroom

Understanding digital culture and its application in the classroom

Introduction

The previous literature review has highlighted the Dialogic approach to teaching and learning to be applied at higher levels of education. The arguments by Laurillard have filled the gaps between the technologies we have and the teaching and learning approach with children. Laurillard emphasised an educationally effective teaching and learning approach that underlines interaction and empathy between teachers and students. Teachers should be involved with lesson engagement and understanding of students' preferences. This type of teaching and learning approach could be promoted in the institutions by upholding learning experiences with the use of conversation and media technologies.

This section aims to set out the ways in which digital culture can facilitate the learning. I have to highlight here that many of the scholars' works in this section are about 5-8 year olds. Although these arguments are approximately 6-8 years ago, those points are relevant to my thesis. The points they made underpinned children's cognitive learning development and social interactions with technology devices to enhance learning. This thesis is in-line with the existing scholars in underlining the significance of the Dialogue teaching and learning approach. An approach that highlights the social-cultural learning theory and the development of children's cognitive intellect with the use of social tools in the digital culture. The references that I assert and the technological devices that I am arguing for, are not necessarily from the recent years. Moreover, Malaysia has just begun to recognise the use of computer technology in schools. But Malaysia has not recognised the Dialogue teaching and learning approach which brings tremendous cognitive intellectual development to children.

Helen Beetham and Rhona Sharpe (2007) claim that the teachers need to take advantage of technological learning facilities that facilitate cognitive learning in delivering class lessons[153]. They highlight that there should be more importance placed on children's cognitive

[153] Beetham, H. and Sharpe, R., 2007. *Rethinking Pedagogic for a Digital Age, Designing and delivering e-learning, An introduction to rethinking pedagogy.* Taylor & Francis Group, London and New York.

development and modern adaptation of learning with technologies to facilitate a livelier educational environment[154]. Hence, this study underlines the importance of Talk or Dialogue teaching and using a learning approach with the use of technology devices in mediating the learning process.

The Digital Age

H. Beetham and R. Sharpe (2007) argue that the digital age symbolises a paradigm shift with a vast impact on the nature of learning, teaching, working, communication, operation methods and handling tasks in society[155]. The nature of human's activities help them organise and execute daily tasks, aid business collaborations and benefit learning and communication methods. For example, the new broadcast media environment allows work and play, the relationship of media convergence, participatory culture, and collective intelligence.

Henry Jenkins (2008), a recognised media expert and professor of literature, described the digital culture as a convergence culture. His book, *Convergence culture: where Old and New Media Collide* (2008) explains the relationship between society (audiences and media producers) and media (channels and contents)[156]. Spectators perform in the new media system that allows for the recent and encouraging technological changes that took place in a broadcast media environment. He underlines the crossroads between new and old media, the behaviour of media audiences and their exploratory experiences. He argues that these trends are called the convergence culture. Convergence culture is the ability of young generations in adapting the old media with the new media. The convergence culture is active in including new communication and information environments where the pioneers and creative users of media are integrated with "fan communities". These trends he claims, are for the young people's social implications, social interactions and learning achievements. With these abilities of

[154] Ibid. pp.1-9.
[155] Beetham, H. and Sharpe, R., 2007. *Rethinking Pedagogic for a Digital Age, Designing and Delivering e-Learning, An Introduction to Rethinking Pedagogy.* London and New York: Routledge Taylor & Francis Group.
[156] Jenkins, H., 2008. *Convergence Culture, Where Old and New Media Collide,* New York and London: New York University Press.

engaging and exploring media, young people are transforming themselves with future trends of their own. He says[157]:

> *"I will argue here against the idea that convergence can be understood primarily as a technological process – the bringing together of multiple media functions within the same gadgets and devices. Instead, I want to argue that convergence represents a shift in cultural logic, whereby consumers are encouraged to seek out new information and make connections between dispersed media content"*
>
> (Jenkins, 2008, p. 3)

This section highlights the claims made by Jenkins about young people and their ability in exploring the media for multiple functions. In the digital age, young people's digital content is made available with technological tools and their own creativity. Jenkins underlines the potential of individual learners in making the effort in using multiple media functions. Jenkins highlights that the culture is changing in people's lives. He uses the term Convergence, which he describes as people's content creations. For example people taking media into their own hands will produce the results that can be wonderfully creative; they can be bad too sometimes. Jenkins wrote: *"Our lives, relationships, memories, fantasies, desires flow across media channels. Being someone such as a mom, a teacher or a lover occurs on multiple platforms of media. We continuously do things for living. This is the cultural logic of media convergence"* [158]. Simply say, the world is changing thus, their live. Some digital age generation prefers to broadcast everything in their lives which are contrasted to the generation before the Interactive media technology. They leverage the opportunity allows by this type of media to showcase their personal lives for a living. Ironically, some people do not care about the outcome of their content creations that have been broadcast to the world. They make use of the technological devices as the useful tools for social interactions, building relationships, earn profits and produce works.

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[157] Ibid. pp. 3.
[158] Jenkins, H., 2005. "Love Online," in Henry Jenkins (ed.), *Fans, Gamers, and Bloggers*, New York: New York University Press.

Digital media, communication and technology

Agnes Kukulska-Hulme and John Traxler, (2007) claim that new technology in the digital age opens up new technical opportunities for learners. They wrote *Designing for Mobile and Wireless Learning* in the book *Rethinking Pedagogy for A Digital Age*[159]. They argue that new ways have changed pedagogically-effective design. Learners are being supported by greater choice in their activities such as learning, engaging, communicating and working with technologies. All the said activities can be done faster and easier with available mobile and wireless facilities (Kukulska-Hulme and Traxler, 2007, pp.180-190)[160]. For example, mobile technologies allow users or learners access to situated, spontaneous, personalised, inclusive and essential materials. Mobile technology brings the content of learning, availability of communication and leveraging of social interaction, all of which are advantageous to users in the space layout and building networking. Mobile phones, for example, are highly effective and easier to use with a good matching between the technologies and learning facilities that the device has whether in school or at home. This statement relates to Vygotsky's theory of children's cognitive learning development. Vygotsky emphasises the use of social tools, social interaction, speech, play and children's cognitive development. Vygotsky highlights the relationships of humans in their sociocultural context. Human beings change themselves in the varied context of culture and history, they internalise the shared experience with their social group. Here, human cognition has the capacity to externalise and internalise their own activities[161].

The nature of mobile learning technologies

Kukulska-Hulme and Traxler claim that online learning has contributed to pedagogic potential. Users are generating learning experiences with short-term trials to larger, more sustained and blended deployment to overcome technical limitations. For example, a study by

[159] Beetham, H. and Sharpe, R., 2007. *Rethinking Pedagogic for a Digital Age, Designing and delivering e-learning, An Introduction to Rethinking Pedagogy,* London and New York: Routledge Taylor & Francis Group.
[160] Ibid. pp. 180-190.
[161] Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., 1978. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press.

Sheehy, et al. (2005); Twining, et al. (2005) on the use of Tablet PCs in England's schools showed that this tool had in-built support for handwriting recognition. Moreover, the Tablet was useful for sharing information among children. Children and teachers use Tablet PCs for presentations and sharing of work via a wireless network or through a projector for whole class display and teaching[162]. In a learning institution, wireless Tablet PCs were used by teachers for records assessment and performance data. The 2005 Joint Information System Committee (JISC) reported that an online managed learning environment is a way of maximizing online learning anywhere and anytime[163]. Kukulska-Hulme and Traxler assert that modules and types of learning for mobile education have been identified to support learning delivery with technologies, devices and hardware. These include handheld media players such as the iPod, computers, PDAs, mobile phones, smart phones and wireless laptops. These items have their own specification, limitations and are compatible with specific existing technologies such as Global Positioning System (GPS), 3G or 4G. Kukulska-Hulme and Traxler claim that academicians should discover other concepts or generalizations that truthfully gauge the learners' experiences and analyze the results by comparing them to conventional learning or e-learning[164]. In analyzing the characteristics of mobile learning technology, these items are described as personal, spontaneous, opportunistic, informal and pervasive. They are situated, private, context-aware, bite-sized, and portable. These characteristics show a distinctive recommendation compared with e-learning. E- learning has sometimes been described as tethered, structured, media-rich, broadband, interactive, intelligent and usable. Kukulska-Hulme and Traxler claim that these distinctions are temporary because of the accessibility to mobile and handheld devices.

Interestingly, Kukulska-Hulme and Traxler's arguments stress the points that Vygotsky has made. That is, I put it as; human beings adjust themselves in the diverse context of culture and

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[162] Beetham, H. and Sharpe, R., 2007. *Rethinking Pedagogic for a Digital Age, Designing and Delivering e-learning, An Introduction to Rethinking Pedagogy.* Routledge Taylor & Francis Group, London and New York, pp. 182.
[163] JISC, Innovative Practice with E-learning: A good Practice Guiden to Embedding Mobile and Wireless Technologies into Everyday Practice, Bristol: Joint Information Services Committee.
[164] Kukulska-Hulme, A. and Traxler, J., *Designing for Mobile and Wireless Learning,* pp. 180-190. Edited by Beetham, H. and Sharpe, R., 2007. *Rethinking Pedagogic for a Digital Age, Designing and Delivering e-Learning, An Introduction to Rethinking Pedagogy.* London and New York: Routledge Taylor & Francis Group.

time, by internalising the shared experience of learning, socialising and working with their social corresponding groups of undertakings. Human cognition has the capacity to internalise and externalise their own activities accordingly to their own needs. These characteristics of situated, private, context-aware, bite-sized, and portable are the processes of human psychological functions. During these processes, humans internalise their higher psychological functions for the 'stimulus –response relation' with the artificial stimuli. The 'stimulus–response relations' is the process of speaking, observing, feeling and touching, using social tools. So, this argument shows Kukulska-Hulme and Traxler's claim about the technological tools sustains this study's argument on the technological devices contributions to pedagogic potential.

For example, in 2007, the Android operating systems was publicised. Android operating systems allow for touch screen functions that mobile devices such as Smartphones and Tablet computers provide for open source with the Internet[165]. The open source promotes free re-distribution and access to an end product's design. The open source code allows some of the software to be freely modified and distributed by device manufacturers. The wireless carriers and enthusiast developers are free to distribute applications, software and learning materials. Mobile users are free to download applications, software and e-learning materials anytime with the Internet accessibilities. In order to support the open source materials, mobile device manufacturers such as Apple Mac, HTC, Samsung have also from time to time improved interface design, processor speed, battery life and connectivity bandwidth[166]. Kukulska-Hulme and Traxler further claim that mobile learning underpins learners' experiences on device ownership, informality, movement and context that are inaccessible in conventional e-learning. There are a number of case studies documenting trials and pilots in the public domain (Attewell and Savill-Smith 2004; JISC 2005; Kukulska-Hulme and Traxler 2005)[167]. In looking at these, they claim that firstly, Mobile learning is technology-driven. Some specific technological

[165] Hall, S. P. and Anderson, E., 2009. *Journal of Computing Sciences in Colleges,* Volume 25 Issue 2.
[166] Mittal, R., Kansal, A and Chandra, R., 2012. Empowering Developers to Estimate App Energy Consumption.
[167] Attewell, J. and Savill-Smith, C., (eds.) 2004. Learning with Mobile Devices, Research and Development, London, Learning and Skills Development Agency. Kukulska-Hulme, A. and Traxler, J., (eds.) 2005. *Mobile Learning: A Handbook for Educators and Trainers,* London: Routledge.

innovation is positioned in an academic setting that demonstrates the technical viability and pedagogic possibility. Secondly, Mobile learning is miniature, portable e-learning for its mobility, wireless and handheld functions. The technologies are used to modernise approaches and solutions available in conventional e-learning, for example by porting some e-learning technology such as a virtual learning environment (VLE). Thirdly, the connected classroom supports collaborative learning with the use of technology such as interactive whiteboards. Fourthly, mobile learning is informal, personalised, situated learning. Technologies are enhanced with extra functionality such as location-awareness or video-capture for more educational experiences that were impossible before[168].

Learners' Preferences

Beetham mentioned Declan Dagger (2005) writing for *Personalization for all: Making Adaptive Course Composition Easy*, who claims that learners have different concerns, likings, techniques and different requirements for learning and support[169]. Besides that, issues such as accessibility and inclusion also need to be considered. Beetham asserts that there are two challenges involved in taking a learner-centred approach. Firstly, learners vary from one to another. Secondly, learning designs are varied in ways that support individual needs, for example, subject-specific experience, access needs, motives for learning, expectations, prior experience of learning, preferred approach etc. A recent review of individual differences in e-learning by Sharpe, et al. (2005) assert that the key issue was learners' emotional relationship to the technologies they were offered. Sharpe, et al. argue that some learners may experience tasks quite differently in terms of the social and cultural meanings involved. With mobile learning, learners make sense of the tasks they are set in terms of achieving the goals and perspective due to the constraints of gender, culture and first language (Sharpe, et al. 2005) [170].

[168] Kukulska-Hulme, A. and Traxler, J., *Designing for Mobile and Wireless Learning*, pp. 180-190. Edited by Beetham, H. and Sharpe, R., 2007. *Rethinking Pedagogic for a Digital Age, Designing and Delivering e-Learning, An Introduction to Rethinking Pedagogy.* London and New York: Routledge Taylor & Francis Group.
[169] Dagger, D., Wade, V. and Conlan, O., 2005. 'Personalization for All: Making Adaptive Course Composition Easy', *Educational Technology and Society: Special Issue on Authoring of Adaptive Hypermedia*, 8 (3): pp. 9-25.
[170] Sharpe, R., Benfield, G., Lessner, E. and de Cicco, E., 2005. Scoping Study for the Pedagogy strand of the JISC e-learning Programme, Bristol: *JISC Online.*

Digital resources and technologies

Beetham asserts that Sue Brindley (2000) in her journal entitled "Teacher perspectives on integrating ICT into subject teaching: Commitment, Constraints, Caution and Change" claims that there is evidence from higher education that students' approaches to writing and argumentation have changed radically since the arrival of the internet and word processing software (Brindley 2000; Wegerif, 2002). Laurillard's Conversation Theory of Learning (Laurillard, 2002; Sharpe and Oliver, Chapter 3) has been specifically useful in bringing choice to learning with the use of digital technologies for learning too. Wilson, (2005) examines how the new generation of services, i.e. digital services, must stand alongside consideration of digital artefacts when designing for e-learning. Beetham asserts that no technologies should be introduced to the learning situation without consideration of learners' confidence and competence in their use. Designers of learning technologies should take into account the learners' own technologies, including mobile phones, email, instant messaging and personal digital assistants (PDAs), digital TV and radio and social software. This, Beetham quotes from Sherry Turkle, (1995). Turkle asserts that the use of 'private' technologies is an essential aspect of the construction of personal identity. She wrote this in her book, *Life on the Screen, Identity in the age of the Internet*. Beetham also cites J. Attewell (2005), who claims that there are preliminary findings that digital technologies can help learners bridge the gap between their existing skills and the kinds of ICT literacy required in formal education[171]. Beetham further claims that subtly and profoundly the use of digital technologies is changing the very meaning of a learning activity. She asserts that designed objects or artefacts such as digital cameras and microscopes, electronic whiteboards, mobile devices, laptop computers and web pages tend to be visible in the learning environment. Digital environments help to structure learners' time and space. Beetham argues that digital editing and analysis tools have changed learners' relationships with content resources. For example, in automating routine activities and freeing

[171] Turkle, S., 1995. *Life on the Screen: Identity in the Age of the Internet*, New York: Simon & Schuster.

up time for other important tasks such as evaluation, comparison and reflection (Attewell, 2005) [172].

Conclusion

The benefits of digital resources are their availability and flexibility. Learners who are able to access them, will reproduce and manipulate benefits. This is obvious due to its availability anytime, any place and at any pace to suit the learners. Tools for creating representations in different media i.e. Power Point, web editors, video and animation software, digital cameras are all advantageous to the learners. Applications such as face-to-face electronic whiteboards and Wikis online are shared to enable collaborative representations. These digital representations are valuable for learners where they can be used for assessment and re-integrated into a learning situation for reflection or peer review or as learning materials for future cohorts.

[172] Attewell, J., 2005. *Mobile Technologies and Learning: A Technology Update and M-learning Project Summary*, London: Learning and Skills Development Agency.

Conclusion

The educational theoretical and practical findings on the Talk or Dialogue approach to teaching and learning have allowed this study to examine further the Talk approach with technological devices for children's cognitive development. The explicit work on Talk or Dialogue approaches has been greatly discussed by the scholars, providing the basis for Talk or Dialogue learning and teaching potential for children's cognitive and psychological development. Relatively, the chapter promotes the Talk or Dialogue approach to teaching and learning in the classroom for children. Interestingly, The *Preliminary Report Malaysia Education Blueprint 2013-2025* states that the Malaysian government's aspirations of preparing Malaysian children for the necessities of the 21st century, are set to increase public and parental expectations of a better educational vision. The emphasis is no longer just on the importance of the knowledge of reading, writing and arithmetic, but the development of higher-order thinking skills. The research shows that the international assessments; PISA and TIMSS (Programme for International Student Assessment and the Trends in International Mathematics and Science Study) propose that Malaysian student performance is declining very much on cognitive performance against the international standards[173].

The statement has given the Malaysia government cause for alarm over children's cognitive development. Therefore, the Ministry of Education has gathered inputs for fulfilling this objective with the help of expertise from UNESCO, World Bank, OECD (the Organization for Economic Co-operation and Development) and six local universities, with schools' principals, teachers, parents and students. In September 2012, the executive summary of the Preliminary Report Malaysia Education Blueprint 2013-2025 was published. The objective outlines how the Malaysian education system needs to come up to par, in terms of the quality of student'

[173] Ministry of Education, 2012. Preliminary Report, Malaysia Education Blueprint, Kuala Lumpur: Government Printers.

performance, with other developed countries in Asia, such as Japan, Singapore, China, and Taiwan[174].

This chapter sets a path for this study to formulate a new teaching and learning approach with Talk or Dialogue and the use of technological devices in the Malaysian classrooms. In the next chapter, this study will analyse further children's Talk, Speech, children's psychological functions development and learning approaches. These topics will be discussed at length, in order to scrutinise this study's research questions. Comparatively, this study could examine critically the existing educational theories on children's speech development. The existing theories that this study has selected are: the dynamic system of human functions as set out by Vygotsky such as perception, attention, sensory motor operations and memory[175]; the theory of child logic by Piaget[176]; the theory of enculturation by Rogoff and Wertsch[177]; and the theory of distributed cognition by Salomon[178]. These theories could stretch this study's contribution to knowledge into a framework for a Talk or Dialogue teaching and learning approach. These topics will be examined in detail in the next chapter in order to underpin this study's contribution to knowledge.

[174] Ministry of Education. 2012. *Preliminary Report, Executive Summary, Malaysia Education Blueprint*, 2013-2025. Kuala Lumpur: Malaysian government printers.
[175] Cole, M. John-Steiner, V. Scribner, S. and Souberman, E., 1978. *L. S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press.
[176] Piaget, J., 1959. *The language and Thought of the Child*, 3rd Edition. Routledge and Kegan Paul Ltd.
[177] Rogoff, B., 1990. *Apprenticeship in Thinking: Cognitive Development in Social Context*, Oxford: Oxford University Press. Wertsch, J. V., 1985. *Vygotsky and the Social Formation of Mind*, Cambridge, MA: Harvard University Press.
[178] Salomon, G., 1997. *Distributed Cognitions: Psychological and Educational Considerations*, Cambridge University Press.

Chapter 2 – The Interaction through Dialogue

Introduction

This chapter examines Talk or Dialogue in more detail, to analyse the relationship of social interaction through Dialogue or Talk with cognitive development, which has been debated by many outstanding scholars such as Piaget, Vygotsky, Mercer, Dawes, Littleton, and others. Section 1 evaluates more deeply Piaget's theory of children's speech as socialised speech. Section 2 scrutinises Mercer, Dawes and Littleton's Talk teaching and learning method of exploratory talk, the Thinking Together Approach, computer Interthinking of Initiation, Discussion, Response, and Feedback (IDRS) in the learning environment. Section 3 examines further Vygotsky's notion of human psychological functions, that is, the extent to which perception and attention affect children's dialogue with interactive mobile technologies. Section 4 analyses the higher psychological functions of sign operations in memory, thinking and speech in children's cognitive development. Lastly, Section 5 observes children's speech, play, tools and their learning development.

The topic discussed in the previous chapter about Talk or Dialogue and social interactions have directed this study to answer these two research questions. Firstly, to what extent does 'Dialogue' contribute to children's cognitive development when experienced through Interactive technological devices? Secondly, to what extent do existing theories of Dialogue and interaction enable us to understand the shaping of children's intellectual development? In these areas, this study hopes to examine the existing scholars' theoretical and practical findings in the UK educational setting, to be recommended for the Malaysia educational system.

Section 1 - Interaction through dialogue: The theory of children's speech

The theory of children's speech

Introduction

This section examines the theory of Child Logic by Jean Piaget. Piaget claimed that the function of language in children's speaking explains the interdependence of logic and language[179]. Children's speech and the claims made by Piaget are relevant to this study. With an understanding of children's speech, we hope to recognise the Talk or Dialogue in the classrooms and outside classrooms with the use of interactive technological devices for learning. We also need to examine the Egocentric speech and Socialised speech argued by Piaget such as: Repetition (Echolalia), Monologue and Dual or Collective Monologue. Socialised speech is defined as: adapted information, criticism, commands, requests and threats, questions and lastly answers.

This section also analyzes a case study made by Naomi Kent and Keri Facer in 2004 in England. This case study is about the use of Information Communication Technology (ICT) by children to socialise and organise their daily tasks[180]. The case study is vital to understanding how children use Talk or Dialogue in their social communication. This, at the same time, has brought interest to further examining children's socialised speech in relation to 'Enculturation' theory (Rogoff, 1990[181], Tishman, Jay and Perkins, 1993[182]; Wertsch, 1998[183]; Fletcher, 2000[184]). From Enculturation theory, this section goes on to examine the Dialogic Socialization Conceptions theory (Wells, 1999[185]; Koschmann, 1999[186]; Lave and Wenger, 1991[187]; Bruner,

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[179] Piaget, J., 1959. *The language and Thought of the Child,* 3rd Edition, London: Routledge and Kegan Paul Ltd.
[180] Kent, N. and Facer, K., 2004. *Different Worlds? A Comparison of Young People's Home and School ICT Use,* with 1800 chidren in the South-West of England conducted in 2001 and 2003, on group interviews in school with over 190 children and visited 11 families.
[181] Rogoff, B., 1990. *Apprenticeship in Thinking: Cognitive Development in Social Context,* Oxford: Oxford University Press.
[182] Tishman, S., Jay, I. and Perkins, D., 1993. Teaching Thinking Dispositions: From Transmission to Enculturation, *Theory into Practice, Vol. 32, No. 3, Teaching for Higher Order Thinking:* pp. 147-153.
[183] Wertsch, J.V., 1998. *Mind as action*, New York: Oxford University Press.
[184] Fletcher, S. J. and Mullen, C.A., 2012. *Mentoring and Coaching in Education,* Sage handbook.
[185] Wells, G., 1999. *Dialogic Inquiry: Towards a Socio-cultural Practice and Theory of Education,* Cambridge, UK: Cambridge University Press.
[186] Koschmann, T., 1999. *Computer Support for Collaborative Learning,* Toward a Dialogic Theory of Learning: Bakhtin's Contribution to Understanding Learning in Settings of Collaboration.
[187] Lave, J. and Wenger, E., 1991. *Situated learning: Legitimate peripheral participation*. New York: Cambridge University Press.

1985[188]). In the end, with these analyses, it is hoped that we will understand Talk or Dialogue in children's cognitive learning development.

In the 1920s, Piaget conducted observational experiments on two children at the Maison des Petits de l'Institut Rousseau, a school of Science in Geneva[189]. The experiments connected with the study of social life and language of children aged 5 and 7 years. The results showed that at these ages, children generally prefer to work individually rather than in groups[190]. From a social point of view, the forms of conversation that Piaget observed happened spontaneously. Children talked to themselves and their sentences were extremely varied. For example, Piaget described how a child was not speaking to anyone when he was drawing at the same table with a friend[191]. Piaget argued that a child's communication through speech is the sole method of communicating his thoughts.

Piaget: the Child Logic theory

Piaget argued that a child's logic and language are interdependent[192]. This section documents part of his experiment to show children's speech. Here are the extracts of the conversations. Their names are: Pie, Ez, Hei, Bea and Lev. They sat together in the observation room and were given complete freedom to talk and play together. The extracts are as follows[193]:

1. Pie (to Ez who is drawing a tram-car with carriages in tow): *But the trams that are hooked on behind don't have any flags* (No answer.)
2. (Talking about his tram-car). *They don't have any carriages hooked on...* (He was addressing no one in particular. (No one answers him.)
3. (To Hei), *this tram-car hasn't got any carriages, Hei, look, it isn't red, d' you see...* (No answer.)

[188] Bruner, J. S., 1985. *'Vygotsky: a Historical and Conceptual Perspective'*, in J.V. Wertsch (ed.) *Culture,*
[189] *The Maison des Petits de l'Institut Rousseau*, 1921-1922. Geneva School of Science.
[190] Piaget, J., 1959. *The language and Thought of the Child,* 3rd Edition, pp. 6, London: Routledge and Kegan Paul Ltd.
[191] Piaget puts in his book a child as he.
[192] Ibid, pp. 1-49.
[193] Ibid, pp. 4.

4. (Lev says out loud, 'A funny gentleman' from a certain distance and without addressing himself to Pie or to anyone else). Pie: *A funny gentleman!* (Goes on drawing his tram-car.)

5. I'm leaving the tram-car white.

6. (Ez who is drawing next to him says, 'I'm doing it yellow'), *No, you mustn't do it all yellow.*

7. *I'm doing the stair-case, look.* (Bea answers, 'I can't come this afternoon, I've got a Eurhythmic class.)

(Piaget, 1959)

Piaget claims that from a social point of view, the significance of these sentences or fragments of sentences is varied. For example, sentence 1 describes Pie talking. When Pie says: "They don't have...etc." or "I'm doing...etc", he is not speaking to anyone. Piaget claims that Pie is thinking aloud over his own drawing. This, Piaget categorised as a monologue. In this instance there were occasions when the child wants to make himself understood. On closer examination, Piaget claims that the child cares very little about who is listening. On the other hand, Piaget argues, the child believes that someone is listening to him and that is all he wants. Sometimes, the child sticks to his own idea and is perfectly satisfied. In this case, the audience is there merely as a stimulating factor for the child. Piaget claims that in a collective monologue, a child soliloquises when talking to himself but with the additional pleasure of feeling himself an object of interest to other people. In contrast, a child also talks to specific persons with the purpose of making them listen and understand. Piaget also claims that a child's speech can be more subjective, consisting of commands, expressions of derision and assertions of personal superiority.

In examining Egocentric speech – consisting of Repetition, Monologue and Collective Monologue – Piaget argues that these forms of speech communicate feelings of confidence and freedom in a child. Simply described, in Repetition mode, a child does not care how his own speech is received or whether anyone is listening. The child just goes on and on speaking without acknowledging anyone. The child repeats speech for his or her own pleasure, with no

thoughts of talking to anyone. Piaget asserts that the way in which a child was reacting was a remnant of baby prattle, devoid of any two way communication. Piaget explains that[194]:

> *"When a child utters phrases in Egocentric speech, he does not bother to know to whom he is speaking nor whether he is being listened to. He talks either for himself or for the pleasure of associating anyone who happens to be there with the activity of the moment."*
>
> (Piaget, 1959, p. 9)

This extract shows the demeanour of a child when talking about himself or herself. He or she has uttered speech simply because he or she wishes to. If there is anyone present at that moment of time, the child will treat them as the audience. Though the child has the illusion of being heard and understood, he asks for no more than a noticeable interest. The child has no desire to influence anyone or to tell his audience anything. In the Monologue mode, however, Piaget argues that the child talks to himself as though he was thinking hard but he does not address anyone. In the Collective Monologue mode, the child associated his or her speech with the action or thought of that moment; the child is not expecting anyone to attend or to understand. In conclusion, these forms of speech, Piaget argues, are 'self-satisfied'. They are remarks in which a child is continually announcing his plans to himself. Piaget claims that there is a sign of a certain 'imaginative exuberance' which describes some kind of imaginative thinking.

Thus, this section asks: Do our children use Egocentric speech when they communicate through the use of the interactive mobile technology devices? The work of Naomi Kent and Keri Facer, "Different worlds? A comparison of young people's home and school ICT use" (2004)[195] was compiled using 1800 children in the South-West of England in 2001 and 2003. This study is being examined in order to relate the type of speeches that Piaget identified with the use of computers as a tool for children.

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[194] Ibid. pp. 9.
[195] Kent, N. and Facer, K., 2004. *Different worlds? A comparison of young people's home and school ICT use. Journal of Computer Assisted Learning,* Volume 20, Issue 6: pp. 440–455.

Children and the use of computers to generate dialogue

Even though the Kent and Facer's study was carried out to examine the use of computers at home and school in 2004, the extracts examined relate to this study in terms of the social interaction process of communication between the children and the technologies. The findings show that the interactive mobile devices are essential as an educational medium and social-cultural tool for children. Children often use computers to do their school tasks or other social activities. The extracts below are the feedback from year 6, 8, and 11 students – a case study interview and group discussion[196].

1. *"All the time, the first thing I got to is like MSN, see if anyone's online. Yeah, it's like you start your coursework, and you've been taking quotes off the net and you've got your Messenger up and you end up talking to people"*
2. *"I just like it because I just chat to people on MSN or whatever and type up some work"*
3. *"I text from the Internet cos it's free"*
4. *"If I'm on the Internet I send loads of text messages, but if I'm not on the Internet I just use my phone"*
5. *"I text my friend a lot. Also I set up a link with friends on the Internet and instead of having to type out the whole words I just type out text talk"*

(Kent and Facer, 2004, pp. 440-455)

Although the above recorded findings focused on the usage of ICT at home and in school, it does reveal the 'dialogue' or communication that takes place between these children. Here, instant messaging (IM) is being used for similar reasons to texting (SMS) or 'chat', such as making social arrangements and discussing homework activities. Interestingly, these findings show that Talk or Dialogue are frequently generated among children. These activities elaborate the research argument that children use IM or SMS (a form of dialogue) to satisfy themselves as Piaget has claimed. For example, sentence 2 echoes Piaget's argument that in Collective Monologue speech, words are thrown out at random and it matters little where they fall. That

[196] Kent, N. and Facer, K., 2004. *Different worlds? A Comparison of Young People's Home and School ICT Use,* with 1800 children in the South-West of England conducted in 2001 and 2003, on group interviews in school with over 190 children and visited 11 families.

said, children use instant messaging, chatting or texting with friends or classmates when they need to. They also type up some work on the computer. And by texting, children push themselves to action. Even when children type for homework, they are also searching and playing with the keyboards. In other words, children use keyboards to select the right letters to form words and numbers. These activities clearly need perception, attention, imagination, excitement, satisfaction and cognitive thinking. Respectively, these arguments relate to Piaget's claims that children excite themselves to action when words are formed. Moreover, children use talk, chat or text with technology tools, indicating, as Piaget argues, there are signs of a certain imaginative exuberance.

Does the children's text, chat and talk activity describe Piaget's Socialised Speech?

This section also examines the Kent and Facer extracts for examples of Socialised Speech. For instance, in sentence 1: "All the time, the first thing I got to is like MSN, see if anyone's online. Yeah, it's like you start your coursework, and you've been taking quotes off the net and you've got your Messenger up and you end up talking to people." This shows that a child first and foremost goes online to see if there is anyone online to socialise with, suggesting their Messenger (MSN) is always there to respond in case there is someone to talk to. This is true even when the child says that he or she is actually doing homework or using the Net. This shows that children socialise amongst themselves with online social networking by using technology tools. Another example reads: "If I'm on the Internet I send loads of text messages, but if I'm not on the Internet I just use my phone" This demonstrates a child wants to tell the listener something. Piaget claims that the Egocentric speech is sometimes being used as an adapted information. The child actually wants to make the listener hear or influence the listener for his conversation. The extract explains that in this instance, the function of language is no longer merely to excite the speaker to action, but actually to communicate his thoughts to other people. That said, the findings show that these children are socializing themselves and spontaneously using the devices at hand to communicate and play. In turn, in chapter 3, this

thesis evaluates more children's talk excerpts from Mercer (2007) and Emma Bond (2010). These excerpts show more about Piaget's theory of Child Logic.

Socialised speech as the Enculturation theory

This section looks again at Barbara Rogoff, who gives her interest to the Child Logic theory and its connection to socialised speech. Rogoff, (1990) argues that contexts give meaning to content. And, meaning appears from the relationship between content and its context. On top of that, Rogoff asserts that learning and knowing are seen as a context of a specific social process. So, this implies that children's speech sometimes derives from their social context. In a social context, their speech is called socialised speech. Socialised speech describes the cognitive contextualization of learning and knowing processes that are happening at the same time as the social process. Following this, Rogoff has named the coordinated activity as 'intersubjectivity'. Coordinated activity involves the partners in a group establishing a task, shared idea or problem which continuously maintains interaction, cooperation and inter-thinking as they progress through the activity. Rogoff asserts that children in a coordinated activity are described as partners. The partners not only interact, they are also cooperating on the activities and inter-thinking on the subject. Ultimately, the inter-subjectivity explains that learners know and have understood the social connection and that these processes have formed human meta-cognition and that the collaborative learning has given some human meanings (Rogoff, 1990)[197].

Situated Cognition as the Enculturation

Jean Lave and Ettienne Wenger (1991) claim 'situated cognition' as "Enculturation". The authors maintain that the term; situated cognition defines thinking as never exactly the same for any two individuals or in any two contexts[198]. Thinking is embedded in the context of the task or activity at hand which then draws on social, cultural, and material resources. Cognitive processes do not reside solely in one's mind but involve relations between a person and a

[197] Rogoff, B., 1990. *Apprenticeship in Thinking: Cognitive Development in Social Context,* Oxford: Oxford University Press.
[198] Lave, J. and Wenger, E., 1991. *Situated learning: Legitimate peripheral participation*. New York: Cambridge University Press.

situation. Therefore, situated learning is often described as "Enculturation" or adopting the norms, behaviours, skills, beliefs, language, and attitudes of a particular community. This relates to this study because the process of Dialogue or Texting with interactive mobile devices locates children's cognition within their own bodies, environment and culture. And 'texting' or 'instant messages' to someone else gives it social context. As a result, "Enculturation" is embedded in the context that draws upon social networking and cultural relations with peers or classmates.

Bruner (1985), in turn, asserts that the cognitive processes do not exist in one's mind but involve relations between an individual and a situation[199]. In relating Bruner's argument to this study, we understand that the Dialogue activities among these children are embedded in the context of chat, instant messages and instant calls. Although Bruner was not talking about the interactive technology devices at that time, his assertions reflect the relationship of "people or situation" that supports cognitive processes in one's mind. In the above extracts, sentence 5 for example[200],

> *"I text my friend a lot. Also I set up a link with friends on the Internet and instead of having to type out the whole words I just type out text talk."*
>
> (Kent and Facer, 2004, pp. 440-455)

The child explains that she or he texts a lot by setting up a link with friends. The excerpt shows children adapt themselves with the technological tools in building relationships to their convenience. These forms of text, Talk or Dialogue draw upon a social relationship of networking, cultural exchanges of ideas, and experiencing usage of material resources. Children's cognitive intellectual development of learning and knowing are seen in the context of specific social processes such as communication, collaboration and the exchange of learning tasks.

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[199] Bruner, J. S., 1985. *'Vygotsky: a historical and conceptual perspective'*, in J.V. Wertsch (ed.) *Culture, Communication and Cognition: Vygotskian Perspective,* Cambridge: Cambridge University Press.
[200] Kent, N. and Facer, K., 2004. Different worlds? A comparison of young people's home and school ICT use. *Journal of Computer Assisted Learning,* Volume 20, Issue 6, pp. 440–455.

Conclusion

This section concludes that the above findings have established the significance of interaction through Talk or Dialogue, as well as the communication these children experienced with technology tools available at home or in the schools. It shows that Talk or Dialogue in the forms of chat, IM (Instance Messaging), SMS (Short Messaging Systems) are the methods of dispersing the content and discussion through the devices. The tasks are the homework they have to discuss, the schedules for their activities at school and their social networking relationships.

On closer examination, this section is able to conclude that the Socialised Speech that Piaget claims had established a significant basis for children's interaction with interactive mobile technologies. The theory of collaborative learning signifies the interaction that the children have with the mobile technologies. The question is: do these children represent the community that leads the way in adopting the norms, behaviours, skills, beliefs, language, and attitudes as described by Lave, Wenger, and Rogoff?

Section II - Interaction through dialogue:

The exploratory talk, Thinking Together Approach, computer Interthinking of Initiation, Discussion, Response, and Feedback (IDRS)

The exploratory talk, Thinking Together Approach, computer Interthinking of Initiation, Discussion, Response, and Feedback (IDRF)

Introduction

The previous section highlighted the theory of Child Logic by Piaget in the 1920s[201]. The conclusion of the section compared Piaget's theory of Socialised speech to the present day Enculturation Theory regarding interaction through dialogue with the use of interactive mobile technology devices. Many topics were also examined regarding children's interactions and the theory of Talk or Dialogue from other scholars. The section examined the concept of Dialogue argued by Rogoff (1990) as 'Enculturation'. Rogoff claims that the contextualization of learning and knowing derives from a community of social involvement, intersubjectivity and interthinking which gives meaning to a child's social interaction[202]. Hence, this study recognises the value of the Enculturation Theory in children's learning to relate the importance of dialogue teaching and learning approaches in the classroom.

This section will examine the interaction through Talk or Dialogue with interactive technological devices for children's intellectual development. The argument draws on Piaget's theory of the cognitive development of human understanding, which he termed 'genetic epistemology'[203]. The term genetic epistemology describes a study of the nature of knowledge and intelligence in terms of its 'genesis' which explains the course of its development. His account also emphasised the importance of interaction between the child and the physical world; the idea that intelligence derives from the coordination of action in the child's environment. Piaget claims that language is a system of symbols signifying the world, it is distinctive in actions and operations that form the processes of reasoning[204]. Through actions, Piaget argues that children can explore how the world works and so build personal and mental

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[201] Piaget, J., 1959. *The language and Thought of the child,* 3rd Edition. London: Routledge and Kegan Paul Ltd.
[202] Rogoff, B., 1990. *Apprenticeship in Thinking: Cognitive Development in Social Context,* Oxford: Oxford University Press.
[203] Mercer, N. and Littleton, K., 2007. *Dialogue and the development of Children's thinking, A Sociocultural Approach,* London: Routledge.
[204] Wood, D., 1998. *How Children Think and Learn: The Social Contexts of Cognitive Development,* Oxford: Blackwell.

representations of it. He asserts that the development and education of the intellect are a matter of the active discovery of reality. This means, children are active in the construction of their own understanding resulting in the fundamental growth of their cognition.[205] As a result, Piaget's idea of 'Intelligence derived from the coordination of actions and operations in the child's environment that forms the processes of reasoning'[206] is of value to this study. Therefore, this section will also examine Talk or Dialogue that has been implemented as teaching tools in schools. For example, how do children actually learn to adapt the learning process in the classroom to outside the classroom. How do they think, reason and develop what they have learned from teachers and peers in schools and parents at home. How do children then act and react in the society. These questions are being examined in this thesis by deliberating the relationships of many theories such as Vygotskian and Piagetian contributions. Therefore, the importance of examining Talk or Dialogue for children's classroom learning is to see how far Talk or Dialogue contributes to children's cognitive intellectual development.

This section will also examine Vygotsky's theory of 'Higher mental functions'. This concept explains thinking, reasoning and understanding in the development of cognitive processes in children as being the core of their developmental process. Vygotsky also attempted to characterise the interpersonal interactions that take place in learning settings and cultural psychology. For this reason, learning is seen to depend upon mediation by social, cultural and institutional processes at many levels[207]. In understanding Vygotsky's theory, this study has selected the work by Mercer and Littleton, (2007) on Dialogue as a sociocultural approach to teaching and learning in the classroom in the UK. Their work is selected in this study in order to examine the importance of Talk or Dialogue in teaching and learning approach with the use of interactive mobile devices. Their book, *The development of children's thinking, a socio-cultural approach* (2007) has documented a detailed analysis of their research on

[205] Piaget, J., 1959. *The language and Thought of the child,* 3rd Edition, London: Routledge and Kegan Paul Ltd.
[206] Ibid. pp. 1-49.
[207] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children's Thinking, A Sociocultural Approach,* London: Routledge.

Dialogue-related teaching and learning approaches in schools[208]. Mercer and his team have conducted their research for more than 16 years on the development of children's thinking and learning through Talk or Dialogue in the classroom. The use of Talk or Dialogue, it is emphasised, should be practiced in classrooms between children and teachers, in group collaborative learning activities and teaching approaches.

This section will scrutinise Mercer and Littleton's research on various ways of using Talk or Dialogue in the classroom as the tools for learning and teaching collaboration. Collaborative learning is a sociocultural approach to teaching and learning in the classrooms between teachers and children. Mercer and Littleton have conducted many types of collaborative activities such as the "Thinking Together" approach, the Exploratory Talks and the interthinking process of IDRF (Initiation, Discussion, Response and Feedback). Mercer and Littleton claim that Talk or Dialogue needs to be implemented in classrooms so that children will learn to reason together and to have educationally effective ways of talking and thinking in their repertoires[209]. Consequently, this section will examine further the significance of Dialogue in the classrooms as claimed by Mercer and Littleton. Then, this section will relate the use of Talk or Dialogue with interactive technological devices, such as texting, chating, talking and social networking, to children's cognitive intellectual development.

The Exploratory Talk teaching and learning approach

Barnes (1976) pioneered the exploratory talk approach in the classroom. Barnes and Todd (1977) found official endorsement in the Bullock Report 1975[210], Kate Norman (1992) [211] and the Open University (1991) for the National Oracy Project[212]; and the National Curriculum 1995[213]. The National Curriculum is a countrywide curriculum for primary and secondary state schools following the Education Reform Act of 1988. The exploratory talk approach of

[208] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children's Thinking, A Sociocultural Approach,* London: Routledge.
[209] Ibid, pp. 69.
[210] DES - Department of Education and Science., 1975. *The Bullock Report,* London: HMSO.
[211] Norman, K., (ed.) 1992. *Thinking Voices: The Work of the National Oracy Project,* London: Hodder and Stoughton.
[212] The Open University., 1991. *Talk and Learning, An In-Service Pack on Oracy for Tecahers,* pp. 5-16, Milton Keynes: Open University.
[213] DFE - Department for Education.,1995. *The Orders of the National Curriculum,* London: HMSO.

teaching and learning was introduced in 1977. But according to Mercer and Littleton, teachers faced a dilemma to combine free and open discussions with their professional responsibility in order to teach a set curriculum at that time[214].

The approach was targeted at building understanding between teachers and children. This is important in encouraging the construction of personal meaning, and shaping and confirming collective understanding. With exploratory talk, teachers helped and shaped the children with the use of Talk or Dialogue in the classroom. The approach requires children to use Talk or Dialogue to reason and learn. This is crucial with the assistance in teachers' interventions, instructions and support. This approach is distinct for schools as a cultural institution created for guiding intellectual development. Mercer and Littleton further claim that the approach gives opportunities for children to use language in many useful ways. For example, when they are away from school, Dialogue helps them extend their repertoire of language genres. Using language more effectively is a means for learning, pursuing interests, developing shared understanding and getting things done. Hence, a major purpose of the approach is to assist children in finding out how to talk and discuss together between them or with teachers. Children then understand that language is a tool for thinking and reasoning, collectively and alone (Mercer and Littleton, 2007, p. 68)[215].

Harry Daniels (2001) argues that it is important to help children to interact in a classroom with others because it may potentially have a more profound and enduring impact. The cultural tool of language does not just mediate teaching and learning, it mediates the broader culture too[216]. Mercer and Littleton stress that careful thought on Talk or Dialogue is needed to give children ways of talking and working together. It is important to help children be aware of the context of interaction in the classroom so that children will learn and work together more productively. Children must know how a learner engages and interacts with others in a wider context of learning. Consequently, children will have a deeper and more enduring impact on their learning and in other pedagogical situations. For example, in their gaining of a better

[214] Ibid. pp. 68.
[215] Ibid. pp. 68.
[216] Daniels, H., 2001. *Vygotsky and Pedagogy*, London: Routledge/Falmer.

understanding of concepts associated with mathematics or science (Mercer and Littleton, 2007, p. 68)[217]. The argument made by Mercer and Littleton has explained the ways Talk or Dialogue within teaching and learning approaches can be understood and looked into further.

Neil Mercer, Lyn Dawes, Rupert Wegerif and Claire Sams, (2004) and Mercer and Littleton, (2007) argue that exploratory talk is a distinctive social mode of thinking and conversation[218]. The approach not only embodies critical thinking but is also essential for successful participation in an educated discourse. Mercer and Littleton claim that educated discourse is the ability of children to speak individually or socially with the skills of knowing, to use intellectual thinking and to provide mutual understanding in solving problems. Mercer, et al. argue that children with these skills are aware of accountability, of clarity, of constructive criticism and are receptive to well-argued proposals. The skills shown by the children of the discourse embody certain principles in the Exploratory Talk approach and also play a basic part in an educated discourse (Mercer and Littleton, 2007, p. 66-68)[219]. Mercer and Littleton claim that in an educated dialogue, the accumulated knowledge, the specialised vocabulary and other linguistic conventions have to be learned. They claim that children need to know how to use language in an exploratory way to get things done and this could impact their cognitive thinking and learning development. They assert, Exploratory Talk comprises such phrases as 'I disagree because...', 'Yes, although...' 'However...'. These words are models for children to use. These words can be practiced in lessons, group activities, as well as discussion with teachers and peers. Mercer and the team designed and developed a teaching program which allows teachers to help children to be shaped and facilitated with the use of Talk or Dialogue.

[217] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children's Thinking, A Sociocultural Approach*, London: Routledge.
[218] Mercer, N., Dawes, R., Wegerif, R., and Sams, C., 2004. Reasoning as a Scientist: Ways of Helping Children to Use Language to Learn Science. *British Educational Research Journal, 30, 3:* pp. 367-385.
[178] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children's Thinking, A Sociocultural Approach*, London: Routledge.

The Thinking Together Approach in classroom learning

The use of Talk or Dialogue in classrooms and schools with or without the help of teachers should not be taken lightly. For example, Talk or Dialogue in the classrooms is a way of expressing one's opinion intellectually. Without proper guidance in practicing Talk or Dialogue, children do not know how to analyse learning material, build the argument for discussions or carry out task solution. Words carry meanings that hold their learning contents. Children in the classrooms work together to be able to represent themselves intellectually.

In analyzing the contributions of Talk or Dialogue in the classroom, this study underlines the importance of the Thinking Together approach, an approach that is built on the Vygotskian notion of language as the prime cultural and psychological tool. Like Exploratory Talk, the Thinking Together approach has its own merits for use in the classroom. This approach is based on the sociocultural perspective of what was designed to ensure that children have educationally effective ways of talking, discussing and thinking together in their repertoires. This approach emphasises the teachers' role to guide and model language use, in order to foster discussion and enable children to understand better the use of language as a tool for thinking. The approach covers the systematic integration of both teacher-led interaction and group-based discussion. The topics or lessons that the teacher provided are well-designed activities for work in groups[220]. These benefits have offered children ample opportunities for learning to talk as well as talking to learn on the topics of discussion and group activities. For example: teacher initiates effective talks by joining the curriculum learning. The teacher initiates the subject of discussion with opening questions such as: "I have read about the topic on …, in my opinion…". Look at the children, teacher then says: "How about you, have you read the topic and would like to discuss it?". These are the examples of the Thinking Together approach that explain the use of Talk or Dialogue between the teacher and children. Mercer and Littleton argue that with this approach, children become more meta-cognitive (a child will become a complete thinker about something. For example, the ability to digest educational materials

[220] Adapted from Dawes and Sams, 2004a., Dawes, L. and Sams, C., 2004a. *'Developing the Capacity to Collaborate'* pp. 105, in K. Littleton, D. Miell and D. Faulkner (eds.) *Learning to Collaborate, Collaborating to Learn*, New York: Nova.

critically; produce questions such as why, when, what and how, and analyze outcomes). Children will be aware of how they go about their learning and thinking through participation in learning conversations. For instance, there was a series of Thinking Together lessons written by Dawes. Dawes and Sams (2004a) explained[221]:

> *"Helping learners to collaborate in order that all might benefit is not just a matter of ensuring that everyone is placidly amenable or that disagreement is quickly stifled or avoided".*
>
> (Mercer and Littleton, 2007, p. 73)

This approach encourages learners to question and discuss dissimilarities of argument and understanding. Mercer and Littleton cite Wells' (1999) claims that dissimilarities are also important in knowledge building, communication is dynamic for changes[222], and, Alexander (2004), "true dialogue entails challenge and disagreement". Mercer and Littleton assert that this approach collaborates and does not 'play it safe'. Children actively create challenges, articulate diverse opinions and confront problems. This brings a secure and supportive learning context that will enable children to take the lead in knowledgeable discourse with others. Sometimes children may raise controversial issues too. They explore different possible solutions to problems by themselves and sometimes with their teachers. By allowing time and opportunity, children are able to ensure that discussions are productive.

As a result, the Thinking Together approach suggests high quality speaking and listening in the class. The high quality of speaking and listening are of great value to children. But teachers have to think and plan the methodology of the approach and how it can work in a classroom context. So, the methodology of the approach was based on the agreements which have been set differently by separate classes/age of the children. A shared set of ground rules was agreed upon by the children themselves. The ground rules then will be used when working in groups (Mercer & Littleton 2007)[223]. For example, a year 4 agreed that they should: share ideas; give reasons; question ideas; consider; agree; involve everybody; and everybody accepts

[221] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children's Thinking, A Sociocultural Approach*, London: Routledge.
[222] Ibid. pp. 73.
[223] Ibid. pp. 71.

responsibility. The whole class is taught ways of using language as a tool for reasoning. The discussions between the teacher and the children are comprehensive and respectful of everyone's opinions and ideas. In order to reach an agreement, relevant information is shared; the reasons should be requested and given. Furthermore, children also become aware of some advantages of group work, they recognise that listening to a range of ideas and comparing them can help arrive at a more reasoned decision. For instance, by learning how to think aloud together they are learning how to think clearly when working together or alone. Through talk, children help each other to understand ideas, generate shared memories and later reflect on what they learned and how they learned it. As a result, opportunities are generated, evaluated and revised together. This approach rejects the static, objectified idea that knowledge is linked with teaching. Mercer and Littleton further claim that the precise nature of the activities in this approach may vary by teacher and children such as the differing curricular demands and age of the learners. For example, Mercer and Littleton assert that a framework for teacher-led-whole-class activities needs to be designed for direct teaching of learning and listening skills. An agreed set of ground rules needs to come from the teacher and the children in order to have a collective discussion and to ensure the talk is productive in the classroom context. The framework is for the direct teaching of speaking and listening skills that children and young people need, so that they learn from and with each other (Mercer & Littleton, 2007)[224].

Computers as tools for developing interthinking

Mercer and Littleton's interest in computers as tools for developing interthinking are to be examined in this section. This study needs to analyze how far Talk or Dialogue also relates to interactive mobile technology devices. How might interactive mobile technology devices such as a notebook, a portable computer or a palm notebook function as a tool for developing children's cognitive thinking? Mercer and Littleton claim that sometimes computers have been treated as though they were living beings. For example, the computer could ask us for some information we want by saying 'ask me', 'won't let me' perform some action or 'can't find' a

[224] Ibid. pp. 69-70.

file. Computers have a unique ability to perform a distinctive educational role with appropriate guidance and software design. Computers do not mind how long you take to respond in computer games as it can encourage a beat-the-clock mentality, as opposed to the reasoned process of problem-solving through discussion and inquiry (Mercer & Littleton, 2007)[225].

In this context Rupert Wegerif (Wegerif, et al., 2003; Wegerif and Dawes, 2004) introduced IDRF (Initiation, Discussion, Response and Feedback). IDRF explains that some discussion between the computer's initiation and its response provides feedback[226]. In other words, there is a distinctive kind of pedagogic exchange that a computer could provide, such as evaluating feedback and responding to it. For example, children can take some time to discuss their possible response together with partners or a group team. Therefore, children have more time to think before responding. This process allows children to consider carefully and discuss among members before keying the answers when 'asked' by a computer to give a solution to a problem. A very simple computer interface and 'tutorial' function in design has the potential to support a productive teaching and learning experience through an IDRF structure.

In summarizing an example of IDRF, Mercer and Littleton assert that children take time to discuss and consider their possible answer together instead of responding immediately[227]. In this case, the Thinking Together context has transformed into a complex and interactive computer-user learning experience because of the interthinking process of the human and the computer. Mercer and Littleton assert that besides helping children to collaborate with the computer, due consideration to the design of the software is also important. The specific features and facets of software can influence the structure and pace of activity, thus basically transforming the cognitive and communicative requirements of learners' actions.

In explaining this computer-interaction cognitive learning or IDRF, we take an example to illustrate the learning process that aids children's cognitive development. A few teachers may teach the same subject from a software design whereas a software design may operate in many

[225] Ibid. pp. 78-79.
[226] Wegerif, R. and Dawes, L., 2004. *Thinking and Learning with ICT: Raising Achievement in Primary Classrooms*, London: Routledge.
[227] Wegerif, R., Littleton, K. and Jones, A., 2003. 'Stand-alone Computers Supporting Learning Dialogues in Primary Classrooms', *International Journal of Educational Research 39 (8):* pp. 851-861.

different styles and techniques for many different people, who have different styles, behaviours and the ways they communicate. Scenario A: Microsoft Office Power Point. A teacher who is skilled in Microsoft Power Point with 5 working years of industrial experience may differ from a teacher without industrial working experience. The same piece of software can generate significantly different educational activity i.e. group task, class assignment, work discussion in the classroom by these two teachers. Likewise, children who are skilled at collaborating on their ideas and using the tools may gain a very different experience from the same computer-based activity than those who are not skilled. The learning process in Adobe Photoshop CS3 requires the ability of the teachers to teach children with the tools that are built into the software. And, a teacher with practical working skills would be able to create and relate the software to the class effectively and productively, for example; Children can be asked to design their own magazine cover with the software. The design must use the software tools to manipulate the images, fonts, symbols etc. The teacher needs to plan strategies in engaging the children's learning process with the software and tools in order to produce good quality results. Therefore, through this type of activity, the teacher makes the children think, operate and experience the activity. This way, children talk, discuss and learn to identify problems or suggest an outcome together with their teacher. This shows teacher and software aid children's cognitive learning process.

Conclusion

We have seen that the exploratory talk, Thinking Together approach and IDRF have encouraged children to engage in particular ways of talking and working together in group activities with computers or alone. Also, children are guided in using language as a tool for reasoning together and building their cognitive intellectual development.

In the conference report for *Educational Dialogue Research Unit, The Open University*, Mercer claims that school-teachers have made comments such as these regarding the Thinking Together approach:

"[The children] are learning a lot more collaboratively, and listening to each other rather than just hearing each other and they make sure that everyone in the group is involved. They feel more empowered…" "The teachers who have (my old class) now have commented on how they are more able to discuss things in groups, not just in their learning but in social aspects as well" [228].

(Mercer, 2007)

As Mercer and Littleton have argued, this approach has been developed over the last 15 years or so. As cited above, Mercer claims in his conference report to the Educational Dialogue Research Unit, the Open University, UK (2007) that the implication of these pedagogic exchanges have benefited children's cognitive learning development and talking skills in the classroom. Consequently, does the significance of these pedagogic exchanges function for the children outside the classroom? Mercer and Littleton argue that the approach of giving reasons, seeking clarification, asking and listening to each other's ideas could make children learn much more than a model set of Talk strategies. The main goal is for the children to understand and appreciate educated ways of talking and thinking, so that they can apply, adapt and develop their use of language flexibly and creatively in their discussions alone or in group activities.

As Mercer and Littleton claim, a prime aim of this approach is to help children learn how to talk together so language becomes a tool for thinking, collectively and alone. With the development of new technology, interest has grown in the idea that computers can support collaborative activity, delivering carefully tailored, personalised instruction. That said, these pedagogic exchanges have been built into children's cognitive thinking development in Britain over the last 15 years or so. Simply put, Britain's children are already equipped with good talking skills in the classrooms. Mercer and Littleton assert that these findings support Vygotsky's claims that with the mediation of the cultural tool of language, social interactions shape children's intellectual development. On the basis of their research, Mercer and Littleton have shown that through collectively (re) constructing and negotiating ground rules to talk and interact, children and their teachers are actively configuring and reconfiguring a distinctive,

[228] Mercer, N., 2007. Thinking Together, *Conference reports, Educational Dialogue Research Unit,* The Open University, UK.

inclusive, flexible environment for working together. In the classroom children talking in an exploratory way in their group are simultaneously creating a positive climate of trust and a culture of collaboration. Classrooms are opening up and maintaining a Dialogic space for pursuing creative solutions to problems. Therefore, children are being inducted into culturally-valued, useful ways of using language to get things done. And lastly, children are learning ways of reasoning that they can take away and use on their own.

Section III - Interaction through dialogue:

To what extent does perception and attention affect children's dialogue with interactive mobile technologies?

To what extent does perception and attention affect children's dialogue with interactive mobile technologies?

Introduction

The previous section analyzed the Exploratory Talk and the Thinking Together approaches of teaching and learning in the classroom. The section also examined the computer as a tool for children in the interthinking process within the pedagogy of IDRF (initiation, discussion, response and feedback). These approaches are distinctive as a social mode of thinking, learning and conversation for children. The approaches showed the embodiment of critical thinking in children's learning and are essential for the successful participation in educated discourse. As a result we value the work of Mercer and Littleton on Dialogue in the classroom for the implementation of the Thinking Together approach and the exploratory talk to children's development of intellectual thinking.

In this section, we will examine the significance of the development of perception and attention and how they relate to children's psychological functions of speech building. Vygotsky emphasised that the human psychological functions include perception, sensory-motor operations and attention, each of which is a part of a dynamic system of behaviour in a child[229]. He also claimed that children's psychological functions are related to the developmental processes of their interaction with the use of tools, speech and play. The use of tools and speech are described as the processes of action and thought that mediate a child in achieving their desired goals.

This section will further examine the linkage between the use of tools and speech that affect children's psychological functions of perception and attention and their cognitive learning development. Considering each function in turn, this section will examine how speech introduces qualitative changes in both its form and its relation to other functions described by Vygotsky. By understanding children's perception and by attention to their psychological

[229] Cole, M. John-Steiner, V., Scribner, S. and Souberman. E., 1978. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press.

functions, this study hopes to examine children's speech and Dialogue with Interactive technological devices.

The Child's Perception

Vygotsky has figured highly in American psychology since the publication of his monograph *Thought and Language* (1962) [230]. In relation to this monograph, the rough translations of another two of Vygotsky's work were made available by Vygotsky's student, Luria for Cole, Steiner, Scribner and Souberman's book, *L. S. Vygotsky – Mind in Society: The Development of Higher Psychological Processes* (1978). The first of Vygotsky's monographs, *Tool and Symbol in Children's Development* (1930), was never published. The second, *The History of the Development of Higher Psychological Functions* (1960) was only published in Moscow . Vygotsky argued that a child's perception does not develop as a direct continuation and perfection in the forms of animal perception. The sight of the animal, he described, is to a much greater extent than adult humans, fully determined by perception and bound by their sensory field. The study of animal perception was initiated by Wolfgang Kohler (1925). He is a scholar in the study of practical intelligence who examined the apes' practical behaviour[231]. He emphasised the significance of the structure of animal's visual field i.e. sight[232]. Earlier than his work on apes, many other scholars such as Alfred Binet and W.E. Stern, (1890) carried out research on children's perception. In the book, *L. S. Vygotsky – Mind in Society*, Cole, et al. claim that Vygotsky discovered some basic laws that characterised the higher human forms of perception. The first set of experiments concerned developmental stages of picture perception in children, similar to Binet and Stern[233]. Both authors found that the way small children describe pictures differs at successive developmental stages. At an early age, Stern claims, children see objects before they perceive actions and relations as a whole. At this age, Stern

[230] Ibid. Editors' preface.
[231] W. Kohler., 1925. *The Mentality of Apes*, New York: Harcourt, Brace.
[232] Cole, M. John-Steiner, V., Scribner, S. and Souberman. E., 1978. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, pp. 31, Cambridge MA: Harvard University Press.
[233] Binet, A., 1890. "Perception de'enfants", *Revue Philosophique, 30*, pp. 582-611., Stern, *Psychology of Early Childhood,cited in* Cole, M. John-Steiner, V., Scribner, S. and Souberman. E., 1978. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press.

claimed, children's perceptual skill proved to be a product of the limitations of their language development. Vygotsky argued that many observations by scholars revealed labelling is the primary function of speech used by young children[234]. Here, children decorate repeated words with very expressive gestures to compensate for their difficulties in speaking meaningfully through language. They break up the elements to triumph over the whole views of what they perceived. Meaning, children perceive objects one by one. Cole, et al. wrote:

> *"By means of words children single out separate elements, thereby overcoming the natural structure of the sensory field and forming new (artificially introduced and dynamic) structural centres".*
>
> (Cole, et al., 1978)

Vygotsky further argues that children's speech is an important part of their cognitive learning development. A series of observations was conducted of children's perception with labelling. The results revealed that labelling is the primary function of children's speech. Children choose a specific object from the entire situation by labelling. They look at the world through their eyes and assess it through their speech (Cole, et al., 1978, p.32)[235]. They wrote:

> *"The child begins to perceive the world not only through his eyes but also through his speech. As a result, the immediacy of 'natural' perception is supplanted by a complex mediated process; as such, speech becomes an essential part of the child's cognitive development".*
>
> (Cole, et al., 1978)

At a later stage of children's development, the intellectual mechanisms related to speech necessitate a new function. Speech obtains a combined function which helps children achieve a more complex form of cognitive perception. Thus, the individual elements in children's perception are important to the child. These elements form a sentence structure for the child.

Language plays a role too in nonverbal tasks, although problems are solved without a sound being uttered. Vygotsky's findings demonstrate the thesis of psychological linguistics as

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[234] Cole, M. John-Steiner, V., Scribner, S. and Souberman. E., 1978. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press.
[235] Ibid. pp. 32.

formulated by A. Potebnya. Potebnya (1892) argued that human thinking and language are interdependent[236]. Vygotsky argued that all human perception consists of categorised rather than isolated pieces of perception. And, perception is part of a dynamic system of behaviour. Vygotsky wrote in his manuscript[237],

> *"By the term (the perception of humans on the real objects) I mean that I do not see the world simply in colour and shape but also as a world with sense and meaning. I do not merely see something round and black with two hands; I see a clock and I can distinguish one hand from the other. Some brain-injured patients say, when they see a clock, that they are seeing something round and white with two thin steel strips, but they do not know it is a clock; such people have lost their real relationships with objects"* [238].
>
> (Vygotsky, 1930)

In a study of choice behaviour in children, Vygotsky illustrated that young children show a changing relationship between perception and motor action. The relationship of these two transformations is very important to their perceptual processes and other intellectual activities (Cole, et al, 1978)[239]. For example, in the experiment that Vygotsky conducted, children aged four and five were asked to press one of the five keys on a keyboard which had been assigned to a series of stimulus pictures. It caused serious difficulties as the task exceeded the capabilities of the children. The result showed that the whole process of selection by children is external. The children do their selecting while carrying out whatever movements the choice requires. The children's choices resembled a delayed selection among their own movements. The movements were full of diffuse touchings that interrupted and overrode one another. The children did not choose the stimulus (the necessary key) at the starting point. Hence, they resolved their choice through movement. They were undecided which to touch between the two

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[236] Potebnya, A.A., 1892. *Thought and Language*, Kharkov, Poland. Cited in Cole, M. John-Steiner, V., Scribner, S. and Souberman. E., 1978. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press.
[237] Cole, M. John-Steiner, V., Scribner, S. and Souberman. E., 1978. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, pp. 32-33, Cambridge MA: Harvard University Press.
[238] Vygotsky, L.S., 1930. *Tool and Symbol in Children Development.* Translated by Alexander Romanovich Luria. Cited in Cole, M. John-Steiner, V., Scribner, S. and Souberman. E., 1978. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press.
[239] Cole, M. John-Steiner, V., Scribner, S. and Souberman. E., 1978. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, pp. 33, Cambridge MA: Harvard University Press.

key stimuli, they moved from one key to another. Their eyes created a new focus when they transferred their attention to a new location. At the same time, their hand moved towards the new centre, in unison with their eyes. In other words, the movement is not separated from the children's perception, coinciding almost exactly. Children's psychological functions of perception, attention, sensory-motor operations and memory changed drastically in the choice processes (Cole, et al, 1978) [240].

The child's attention

Vygotsky claims that the use of tools is important to children's attention. Since Kohler's experiment on the apes' behaviour, Vygotsky has claimed that many scholars recorded that the ability or inability to express one's attention are an important cause of the success or failure of any practical operation. Children are capable of reconstructing their perception and freeing themselves from the given practical operation task[241]. This means, children observe, pause action and reconstruct the next action for a solution. Based on the earlier experiment, Vygotsky then simplified the experiment by marking each key with a corresponding sign. The sign served them as extra stimulus that would direct their choice process. The result showed that this task was successfully fulfilled by the children. The children were able to master their attention and create new solutions with the help of the indicative function of words stated on the sign. In his words, Vygotsky argued that children are able to determine the "centre of gravity" of their perceptual field; which means the focus point. With the help of speech, children create a time field that is as perceptible and real to them as the visual one in addition to reorganizing the visual-spatial field. Meaning, children focus their attention on the object/task by generating a pause action to continue the activity. In other words, they took a little time to see and touch the object of experiment before they solve the problem. Koffka says:

"Their behaviour is not synchronized solely by the independent element within the task. But children evaluate the importance of these elements with their eye, singling out new

[240] Ibid. pp. 34-35.
[241] Ibid. pp. 31-35.

figures from the background of the object/task and widening the possibilities for controlling their activities"[242].

(Koffka, 1924)

To paraphrase Koffka's words: Children observe carefully, think and touch the object of the experiment and utter speeches. These behaviours happened at once with the use of their hands to touch and at the same time they speak. The speaking child has the ability to direct his attention in a dynamic way. Therefore, Vygotsky concludes that children can view changes in their immediate situation from the point of view of past activities, and they can act in the present from the viewpoint of the future[243]. Vygotsky further claims that children pay attention in order to see and solve a task. Thus, over time, the child keeps on trying an error by touching the object or task given. Then, the child makes the next movements. As a result, Vygotsky asserts that children learn through the activities they developed in the operations. Vygotsky wrote[244]:

"*Thus the child's field of attention embraces not one but a whole series of potential perceptual fields that form successive, dynamic structures over time. The transition from the simultaneous structure of the visual field to the successive dynamic field of attention is achieved through the reconstruction of the separate activities that are a part of the required operations. When this occurs, we can say that the field of attention has detached itself from the perceptual field and eventually unfolded itself, as one component of a dynamic series of psychological activities or the potential perceptual fields*".

(Vygotsky, 1930)

Conclusion

In this section, I demonstrated that thought, language, perception, attention and sensory-motor operations are part of a dynamic system of behaviour in a child. The use of tools and speech are described by Vygotsky as the processes of action and thought that mediate the

[242] Koffka, K., 1924. *The Growth of the Mind,* Routledge and Kegan Paul, London. Cited in Cole, M. John-Steiner, V. Scribner, S. and Souberman, E., 1978. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press.
[243] Cole, M. John-Steiner, V. Scribner, S. and Souberman, E., 1978. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press.
[244] Vygotsky, L.S., 1930. *Tool and Symbol in Children Development.* Translated by Luria. Cited in Cole, M. John-Steiner, V. Scribner, S. and Souberman, E., 1978. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press.

child's perception and attention in achieving the desired goals. With the help of speech, the child creates a sight that is seen as real and renders them the ability to communicate. Children then re-organise the visual fields to suit their purposes.

Interestingly, the arguments made by Vygotsky on children's perception and attention emphasise the importance of the use of speech. Especially, the relationship with children's cognition. This argument leads us on to the next question central to this thesis: how do perception, attention and speech relate to the use of interactive mobile technology devices? How does the process of interaction through speech or dialogue with technological devices contribute to the children's cognitive intellectual development of thinking and learning? Does a child create a time field with the mobile devices? What about their past and present perceptual fields such as the mobile technology tools? Do children succeed after re-organizing all these perceptual fields to suit their own purposes in future undertaken activities?

Here, we compare one of the critical issues in Vygotsky's theory of development. As John-Steiner and Souberman wrote in the *Afterword,* Vygotsky gives emphasis to the basic relationship between the biological behaviour and social conditions in which human activity takes place. Vygotsky claims that the human species are unique as they change themselves in the diverse contexts of culture and history. His concern was with the consequences of human activity as it transformed both nature and society. Hence, Vygotsky recommended a key concept that represents this important interaction. Once again, interaction is the functional learning system in the development of a child's intellectual cognitive learning through his perception and attention which generate speech (Cole, et al., p.124).

Section IV - Interaction through dialogue;

The higher psychological functions of sign operations in memory,

thinking and speech

The higher psychological functions of sign operations in memory, thinking and speech

Introduction

In the previous section, we examined the development of perception and attention in children's psychological functions of speech building. Vygotsky asserts that the higher psychological functions include perception, attention, sensory-motor operations, play, memory, speech and thinking, all of which are related to the dynamic system of children's behaviour. Vygotsky argued that through verbal formulations of past experiences and activities, the child frees him or herself from the limitations of the ideas in their mind by producing speech. Children succeed in recreating their past experiences and activities to suit their present purposes. Speech changes its form rapidly from moment to moment in relation to a child's development.

This section sets out to examine the intermental and intramental processes in children's speech. Speech is an excellent example of a sign-using activity. Vygotsky argued that speech is pervasive and is a profound part of higher psychological processes. Once internalised, speech acts to organise, join, and put together many different aspects of human behaviour. More of this will be discussed in turn to examine the relation between memory and thinking to children's speech building. This section will also explain the tools and non-verbal signs which provide children with ways to become more efficient in their adaptive and problem-solving efforts as Vygotsky argued. The study of children's memory and thinking with the use of 'sign-using activity' in basic psychological functions is appropriate in this section. Vygotsky claims that sign-using activity includes speech, drawing pictures, writings, and actions including tying a knot with a handkerchief or putting a stick as a reminder in a book. He called these activities the practical intellectual development of humans. He claimed that these activities are not discovered by the child in a sudden insight, but by a natural process of experience that eventually leads to a process of psychological evolution. These activities develop into children's higher psychological functions and initiate the 'stimulus-response relations' with artificial stimuli. The 'stimulus–response relations' explain that the main basic functions of

these activities are driven by a process of stimulation from the environment. The artificial stimuli are the mediated activity initiated by humans with aid from outside (such as social tools) to control their behaviour. Meanwhile, higher psychological functions are the 'intramental' or the inner processes of perception, attention, memory, sensory-motor operations and so on that generate the child's action for stimulation. Thus, this section reveals the social source of human activity as well as its critical role in the individual's development. More importantly, this section examines the functions of memory and thinking in children's development relating to sign-using activity (Cole, et al., 1978)[245].

Mediated Memory

Cole, et al. (1978)[246] claim that the investigation of human memory reveals that there are two types at the early stage of a human being's social development. One is the natural memory which controls the action of non-literate people. This memory is the actual experiences as the basis of memory traces and a non-mediated idea of material retention. E.R. Jaensch (1930), in his studies of eidetic imagery, or so called eidetic memory[247] wrote that this form of photographic memory is very close to perception, influenced directly from external stimuli and is immediate. In other words, a normal human's memory has the ability of remembering an object or experiences. In contrast, the other type of memory is called the mediated memory. The mediated memory explains the use of leaves or petals as a bookmark, the handkerchiefs to make a knot, the use of notched sticks and knots,[248] putting notes on a piece of paper, writing or creating simple memory aids. These types of activities are done by humans to memorise something. These activities, Cole, et al. argued are the 'sign-using activity' product of specific

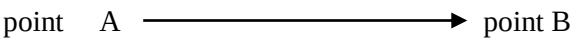
[245] Cole, M. John-Steiner, V. Scribner, S. and Souberman, E., 1978. *L. S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes,* Cambridge MA: Harvard University Press.
[246] Cole, M. John-Steiner, V. Scribner, S. and Souberman, E., 1978. *L. S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes,* Cambridge MA: Harvard University Press.
[247] Jaensch, E.R., 1930. *Eidetic Imagery,* New York: Harcourt, Brace. Cited in Cole, M. John-Steiner, V. Scribner, S. and Souberman, E., 1978. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes,* Cambridge MA: Harvard University Press.
[248] Vygotsky is referring here to the technique of using knotted rope as a mnemonic device among Peruvian Indians. No reference is given in the text, but from other manuscripts it appears that the writing of E. B. Taylor and Levy-Bruhl provided these examples.

conditions of social development (Cole, et al, 1978)[249]. These activities incorporate a new culturally-elaborated organization of human beings' behaviour. For example, a simple activity such as tying a knot or marking a stick changes the psychological structure of the memory process. These activities demonstrate the early stages of human development which change over time naturally in line with their social-cultural environment and behaviour. Moreover, these activities have also incorporated artificial stimuli, or self-generated stimuli which extend the operation of the original normal human's memory. These activities are unique to human beings as they signify a new form of action or behaviour which is in relation to 'stimulus–response'. Therefore, Vygotsky claims that the creation and use of those artificial stimuli will finally become the immediate cause of human behaviour and activities.

Structure of Sign-using activity operations

Below is a Figure to show the diagram of the sign-using activity operations. The diagram shows that point A and point B are connected. Vygotsky claims that every basic form of action presumes a direct reaction to the task set such as from one point to another as from point A to point B[250] such as this:

Figure 1



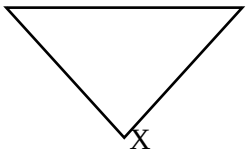
However, Vygotsky argued that the structure of sign-using activity operations requires an intermediary link between the points. He called this the 'stimulus and the response'. He claims that there is the 'intermediary link' between these points that develops the relationship between point A and point B.

The intermediary link is a second order stimulus that is put into the operation. It accomplishes a special function between point A and point B. The intermediary link is 'drawn into' an operation by an active individual that is busy establishing such a link. The sign-using

[249] Cole, M. John-Steiner, V. Scribner, S. and Souberman, E., 1978. *L. S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes,* Cambridge MA: Harvard University Press.
[250] Ibid. pp. 39-40.

activity operation works on the individual, not the environment. There is a reverse action of the natural memory involved in this process. Vygotsky argued the stimulus and response relation is replaced by a complex mediated act of activities. Vygotsky claims that this activity is a complex mediated act; there is a relation of a series of perception, attention, sensory-motor operation and memory that is going on with the child. This relation is explained as in this Figure 2[251]:

Figure 2

(The stimulus/ The child) Point A  Point B *(the response/the goal)*

(X is the intermediary link/the supporting stimulus e.g.. tying a knot with a handkerchief)

Figure 2 describes the intermediary link (X) or the supporting stimulus which is incorporated between point A and point B. X helps the completion of A to B by indirect means. Vygotsky asserts this type of organization is basic to all higher psychological processes[252]. X possesses the specific function of reverse action that transfers the psychological operation to higher and qualitatively new forms. A reverse action happens that allows humans to control their behaviour from the outside by the aid of extrinsic stimuli, such as the use of tools. It breaks away from natural development and makes new forms of a culture-based psychological processes.

The experiment made by Vygotsky and his student Leontiev, (1928) demonstrated the role of sign operations in children's memory. Leontiev claimed that there were three basic stages of development which were: preschool age, school age and adults[253]. In an experiment, a group of children played a game and answered a set of questions by using words or colour cards in their answers. A set of twenty words was given to children of different ages and levels of mental ability. The materials were presented in three different ways. Firstly, the words were spoken at

[251] Ibid. pp. 39-40.
[252] Ibid. pp. 44-47.
[253] Leontiev, A.N., 1928. "The Development of Mediated memory" *Problemi Defektologiga, no. 4.* Cited in Cole, M. John-Steiner, V. Scribner, S. and Souberman, E., 1978. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press.

intervals of three seconds for the children to recall. Secondly, a set of twenty pictures was given to the children, who were supposed to use them to help recall the words. The pictures were not models of the words but connected with them. Thirdly, twenty pictures bearing no obvious relation to the to-be-remembered words were used. The research was to examine to what extent children can convert their remembering into a mediated activity using pictures as auxiliary memory aids. And most importantly, how does children's success depend upon the different degrees of difficulty represented by the two types of memory - basic and mediated series.

The results indicated three basic stages in the development of mediated remembering. The preschool age children were not capable of mastering their actions by organizing special stimuli. However, the 10- 12 year olds recalled twice as many words when the pictures were available as memory aids as they did without them. They made use of both picture series equally well. The experiment shows the effectiveness of the child's activity improves significantly where the external sign predominates as the support stimulus. This shows a psychological instrument acting from the outside. Mildly mentally-challenged children of the same age benefited little. For severely disabled children, the auxiliary stimuli actually interfered with performance (Leontiev, 1928)[254].

This research demonstrates the 10-12-year-old children are controlling their behaviour from the outside with the aid of extrinsic stimuli. They used the second type of memory called the mediated memory as claimed by E.R. Jaensch. Thus, this study shows the relationship of Leontiev's research into its targeted children (aged 10-15) to the use of interactive mobile technology devices in producing text, Talk or Dialogue. A case study has been used done in this thesis to show the use of text by children through technological devices and is documented in the next chapter. The case study was conducted by Emma Bond in 2010 in the UK with a group of school children aged 10-15. She interviewed these children and she has concluded her findings on the use of technological devices for children's relationships. I took this material and

[254] Leontiev, A.N., 1928. "The Development of Mediated memory", *Problemi Defektologiga, no. 4.* Cited in Cole, M. John-Steiner, V. Scribner, S. and Souberman, E., 1978. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press.

examined the text with the six characteristics of the Dialogic Framework that this thesis has synthesised into one solid component of children's cognitive learning theory made by the existing scholars.

The activity theory

Activity theory originated from the work in the former Soviet Union of such writers as Vygotsky, 1978[255]; and Leontive, 1978[256]. Following their work, scholars such as Bodker, 1989[257]; Kuutti, 1991[258]; Wertsch, 1981[259]; Davydov, Zinchenko and Talyzina, 1982[260] and Raeithe,l 1991[261] deliberated over the theory. They attempted to describe a core set of concepts of activity using the actions of many activities involving technology, people, machines, and tools. Engestrom et al., 1998;. claim that the activity theory, initiated by Vygotsky and Leontive has now been recognised as a multi-disciplinary research approach for the study of related technologies[262]. Engestrom, 1987 initiated a longitudinal study of work re-design in the multi-organisational field of children's medical care in the Helsinki area of Finland. Activity theory explains how actions that were taken in medical care impacted on the participants and their developmental potential. There is a collective of actions which are consecutive, and constitute a wider and more stable system of transient events in the medical activities involved in the hospitals (Engestrom, 1987)[263]. In detailed theoretical terms activity theory describes how people's actions contribute to the activities; i.e. the physicians, the staff or nurse, the computer as the technical instrument, the patient, the data, the results, the rules and the community. According to Engestrom, these activities are central to any problem as there is an evolving,

[255] Vygotsky, L. S., 1978. *Mind in Society*. Cambridge, MA: Harvard University Press.
[256] Leont'ev, A., 1978. *Activity, Consciousness, and Personality.* Englewood Cliffs, NJ: Prentice-Hall.
[257] Bødker, S., 1989. A human activity approach to user interfaces. *Human-Computer Interaction* 4: pp. 171– 195.
[258] Kuutti, K., 1991. Activity theory and its applications to information systems research and development. In H.-E. Nissen, ed., *Information Systems Research,* pp. 529–549. Amsterdam: Elsevier Science Publishers.
[259] Wertsch, J. (ed.)., 1981. *The Concept of Activity in Soviet Psychology*. Armonk, NY: M. E. Sharpe.
[260] Davydov, V., Zinchenko, V., and Talyzina, N., 1982. The problem of activity in the works of A. N. Leont'ev. *Soviet, Psychology* 21: pp. 31–42.
[261] Engestrom, Y., 2000. Activity Theory as a Framework for Analyzing and Redesigning Work, Ergonomics, Vol. 43, No. 7: pp. 960 – 974.
[262] Nardi, B.,1999. Studying Context: A Comparison of Activity Theory, Situated Action Models, and Distributed Cognition.
[263] Engestrom, Y., 1987. Learning by Expanding, An Activity-Theoretical Approach to Developmental Research, Helsinki: Orienta-Konsultit.

collective, activity system that networks to many other activities, including goal-directed actions, as well as automatic operations. The subordinate units of analysis comprise the entire activity system that generates actions and operations, and these activities can develop effort, emotion, excitement or frustration that gives rise to the continuity and coherence of the system.

The theoretical relationship between activity theory and the stimulation and response concept of Vygotsky.

Activity theory consists of actions, scripts and activity systems, a plain model for this study's concept of Talk or Dialogue in learning with the technological medium, through teachers' guidance. The Talk or Dialogue is the scripts – a stimulation of actions that derive from learning activities in the classroom. The learning activities are the series of activity systems in the classroom that involve many processes and people; children, teachers, administrators and parents. Learning activities contribute to the achievement of knowledge and learning goals, for example, with the use of interactive technological devices in the classroom for the learning process which needs more than people. There are also other factors such as the educational system, internet technologies, expertise, school administrators etc. Therefore, this concept can be seen as an extension the stimulation and response concept in children's learning with the use of tools that Vygotsky initiated. He claimed that children's learning achievements are stimulated by many processes, such as their social interactions, social tools, their community and adults' guidance. This thesis looks at the concept of activity theory for children's Talk or Dialogue in the classroom with teachers and the use of technological devices. Vygotsky claimed that the use of social tools and the stimulus-response relationship develop children's learning and speech. This study relates these kinds of processes of Talk or Dialogue as learning activities, social interactions and technology with the human psychological functions of perception, attention, sensory motor-operations and memory.

The qualitative transformations of Sign-Using Activity

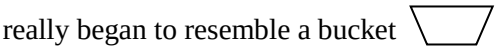
Cole, John-Steiner, Scribner and Souberman further argue that sign-using activity appears as a result of an intricate and prolonged process that is linked in stages and historical in nature. It is a natural psychological representation that inherent patterns of thought exists prior to any experience. Cole, et al. wrote:

> "*This metaphysical view, according to which inherent psychological schemata exist prior to any experience, leads inevitably to an a priori conception of higher psychological functions*".
>
> (Cole, et al., 1978)

Cole, et al. claims that the sign-using activity in children is not simply invented or passed down by adults, but it becomes one only after a series of qualitative transformations. Each of these transformations is shaped by the earlier ones providing for the next stage of development. They assert that the concept of development creates two qualitative differences. One is the elementary processes, which are described as an early childhood stage, biological in origin. The development of children's memory structure was argued as a single function in early childhood. During this stage, their memory is the only one central psychological function whereby all the other functions are built. Their concept of thinking, visualizing and speech is determined by their memory. For example, based on their recollections of memory, children say something that they have memorised. Vygotsky wrote: *"For young child, to think means to recall; but for the adolescent, to recall means to think."* And the other one is the higher psychological functions of sociocultural origin. Cole, et al. argued that the history of child behaviour is an interweaving of these two differences which shows their prehistory, biological roots and organic disposition (Cole, et al, 1978)[264]. At this stage, children's memory is "logicalised" as they establish and find logical relations such as the ability of discovering what has to be found[265].

To relate the evidence of the early childhood processes, Leontiev used an experiment done by L.V. Zankov (1949), his student, in which he demonstrated that younger children,

[264] Ibid. pp. 46
[265] Ibid. pp. 50-51.

particularly between the ages of four and six, must rely on meaningful, ready-made links between the "reminder" sign and the word to be remembered[266]. Reminder signs describe symbols that represent something that looks like the object. Children, Zankov showed, refuse to make use of meaningless figures. For example, the figure  presented as a reminder of the word "bucket", was turned upside down by the children and served to remind them of the word only when the figure really began to resemble a bucket  . Cole, John-Steiner, Scribner and Souberman claim that based on the original transcripts, the research by Leontiev leads to the conclusion that the child focuses on the auxiliary picture stimulus and associates it with the word to be recalled. But the child cannot integrate the stimulus into his or her system of remembering. Vygotsky claims that the mediated memory does not totally coincide with the development of the young children. As for the adults, the reason for the failure of Sign-Using Activity is because the process of mediated memorizing activities is so fully developed, it occurs even in the absence of special external aids.

Conclusion

This section has examined children's higher psychological functions of sign operations in memory, thinking and speech. The results from Vygotsky's experiments reveal the theory of sign-using activity in children. Vygotsky claimed that sign-using activity shows the existence of the intermediary links between a child and the tools. The intermediary link possesses the specific function of reverse action of a child to complete an activity. This process, Vygotsky claimed as the higher psychological functions of memory. A reverse action means a child controls his or her behaviour from the outside by the aid of tools. Vygotsky asserts that human beings actively remember with the help of signs. A child has the capacity to externalise and share with others his or her understanding of shared experience. And Vygotsky's fundamental hypothesis is that the higher mental functions are socially formed and culturally transmitted.

[266] Zankov, L.V., 1949. *Memory*, Moscow: Uchpedgiz. Cited in Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., 1978. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press.

Interestingly, Vygotsky's statements have triggered many related questions on children's Talk or Dialogue through interactive mobile technological devices. These devices are the tools that children have besides the conventional learning in the classroom, social relationship and living. Vygotsky's work can relate to children's Talk or Dialogue with the use of interactive technological devices. A child's Talks or Texts are the manifestation of the sign-using activity as presented in Figure 2. Talk or Dialogue are the higher mental functions of a sign-using activity. The Talk or Dialogue are the intermediary links that mediate children with technological devices. Talk, Text or Dialogue is a form of sign-using activity in the current culturally transmitted activities. Children play with interactive mobile devices; children text, Talk or Dialogue to communicate; children complete their tasks; children use social networks. These activities are socially formed and culturally transmitted showing their higher psychological development of memory and cognitive thinking. These activities show children control their behaviour from the outside with the aid of interactive mobile devices. A special line of development happens to children in mediated psychological functions of their perception, attention, sensory-motor operations and memory to Talk, Text or Dialogue with technological devices.

Thus, this thesis has built the case, based on Vygotsky's theory of sign-using activity, for children at the age of ten to twelve to represent a special line of development in mediated psychological functions. This explanation is suitable for this thesis to relate the development of children's cognitive learning with the use of Text, Talk or Dialogue through the technological devices. Vygotsky claims that children control their behaviour from the outside with the aid of extrinsic stimuli. Vygotsky wrote [267]:

> *"If one changes the tools of thinking available to a child, his mind will have a radically different structure"*.
>
> (Berg, "Vygotsky's Theory" n.d, p. 46)

[267] See Werner, H., 1961. *Comparative Psychology of Mental Development,* New York: Science Editions, pp. 216ff. Cited in Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., 1978. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press.

That said, Vygotsky's statement implies the hypothesis that through Talk, Text or Dialogue with mobile devices, children are able to internalise the devices for social means. Vygotsky asserts that one of the important aspects of development is the significant ability of children to control and express their own behaviour. This process, called 'mastery' is made possible by an individual in the development of new psychological forms and functions with the use of signs and tools. One of the significant features of children's development is the growing ability to control and direct their own behaviour or actions. Therefore, in this thesis, this is shown by Text, Talk, or Dialogue via interactive mobile technological devices.

Section V - Interaction through dialogue;

How perception, speech, play and tools contribute to children's learning development

How perception, speech, play and tools contribute to children's learning development

Introduction

This section examines the relationship of sociocultural activities such as speech, play and social interactions as described by Vygotsky to the present-day interactive mobile technologies and their usefulness in children's learning development. This also includes Vygotsky's theory of speech, the zone of proximal development and play, as well as later scholars' arguments on scaffolding, distributed cognition and shared knowledge. All these theories are important to the furthering of children's cognitive and intellectual development.

Speech

Vygotsky believes human speech is the most important sign-using behaviour in children's development. He claims that children free themselves through speech from many of the immediate difficulties that they are facing. With speech, children are able to prepare, plan, order and control their own behaviour as well as others for future activities (Cole, et al., 1978)[268]. In an experiment, Vygotsky recorded that a child achieved their goals just by using speech. A child's speech and actions go on simultaneously, thus, he or she provides commentary after speaking about what they are doing. The commentary describes how a child engages in a number of initial acts, as well as mediated methods such as asking questions to the people standing nearby them. At the same time, the child solves his or her problems as their speech reacts to their complex psychological functions of perception, attention and social interaction. The social interaction is the 'external stimuli' which represents an external activity to the child. The child gains external activity from his or her surroundings then develops their inner organization of thought. The inner organization of thought is the 'internal stimuli', such as speech, which mediates and regulates the child's activity. In turn, those thoughts mediate the

[268] Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., 1978. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press.

meaningful signs; i.e. their speech and actions. Speech and actions, Vygotsky claims, mediate the child's thinking with the use language and develops him or her to a much higher level of complexity. This means, the child is able to engage, respond and produce intellectually productive work in the society. He asserts that the greater the child's action, the more they rely on speech. Vygotsky wrote[269]:

> *"They are characterized by a new integration and co-relation of their parts. The whole and its parts develop parallel to each other and together. We shall call the first structures elementary; they are psychological wholes, conditioned chiefly by biological determinants. The latter structures which emerge in the process of cultural development are called higher structures... The initial stage is followed by that first structure's destruction, reconstruction, and transition to the structures of the higher type. Unlike the direct, reactive processes, these latter structures are constructed on the basis of the use of signs and tools; these new formations unite both the direct and indirect means of adaptation".*
>
> (Vygotsky, 1930)

Vygotsky argued that the higher psychological development such as perception, attention and sensory-motor operations will eventually form the unity of children's goals and adaptation. For example, A. R. Luria stated that the unitary functions of these components and relations are formed during each individual's development and are dependent upon the social experiences of the child. Then, the functional systems of an adult are shaped essentially by his or her prior experiences as a child, as well as the social aspects (Cole, et al, 1978)[270]. The basic functions are integrated into new functional learning systems. At the same time, the child's higher psychological functions are not being usurped by the basic processes. They represent a new psychological system in the child.

The child's cognitive development and its relationships with the zone of proximal development (ZPD)

[269] This passage is from the unedited translation of "Tool and Symbol", 1978. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, edited by M. Cole, V. John-Steiner, S. Scribner and E. Souberman. *Afterword*, Cambridge MA: Harvard University Press.

[270] Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., 1978. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, pp. 124, Cambridge MA: Harvard University Press.

Vygotsky emphasised the role of learning in facilitating and supporting people in society. In the societal context, children's learning and behaviour development require interaction and support by their guardian, teacher, more capable peers or parents. Interaction, engagement and participation are the major factors that are critical for children's learning process. Children learn from teachers, more capable peers or parents. Vygotsky included the specification of the societal context in which the child's behaviour developed, such as children's action or reaction through their involvement with society that develops the quality of humans and relationships. Therefore, children experienced and formed their quality of life, such as their attitudes and beliefs accordingly based on their cultural background. Children then commit to many achievements which provide value through rapport and coercion. In ZPD concepts, Vygotsky highlights social context influences as core to children as their attitude and belief. Social context is the influence and guidance produced by adults or more capable persons. He emphasised the importance of individual intelligence. Vygotsky insisted on the construction of knowledge and understanding as a natural process of social activity between children and parents or teachers. A natural process of learning means children gain knowledge better through speech, face to face context, playing together or learning through mistakes and so on. He claims that the processes are more valuable than just mainly based on direct interpretations of the physical world. Thus, the child is mediated by the society he or she is growing up within. With social interactions, children encounter a great many things with many people (Cole, et al, 1978)[271].

Mentioning this, Mercer and Littleton argue that a child's cognitive capabilities can be defined in terms of what they can achieve unaided when faced with a task or problem. For example, most assessments test what individuals can do without help. But individual achievement differs in many ways. They quote that Vygotsky outlined the accomplishments that are possible for any child when given a measure of support and guidance by the adults within that child's ZPD. Mercer and Littleton maintain that ZPD concept makes possible

[271] Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., 1978. *L.S Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press.

accomplishments in the children's near future. The ZPD is an integral part of an interactive theory of cognitive development; instruction is only said to be useful when learning moves ahead of development. And the ZPD is the process of joint activity for children and parents at home or teachers in the classrooms (Mercer & Littleton, 2007)[272].

Cognitive distribution as shared knowledge

Cognitive distribution explains how cognition is distributed in many ways. For example, we live in a physical world that consists of nature, buildings, individuals, tools etc. Thus, we interact continuously with people, technologies and society. As Vygotsky argues, learning for a specific cultural purpose requires the involvement and support of others and that interaction with teachers, more capable peers or parents is critical in the process of children's development. Based on Vygotsky's concept of ZPD, we have seen in Chapter 1 – Sec 2 the work of Perkins and Salomon (1992). They argue that learners find connections between different ideas, fields of study and basic concepts when nurturing connections by choosing what to learn and being able to deal with the shifting nature of information[273]. Distributed cognition is how activities are mediated by the rich assortment of technological artefacts found at home or in the workplace: for instance the house compound, the playground and the technology etc. Simply put, what they see, hear or talk within these places with adults or parents is the learning process. Salomon (1997) argues: *"an essential feature of learning is that it creates the zone of proximal development"*. That is, learning promotes various internal developmental processes that are able to work only when the child is interacting with people in his environment and in collaboration with his or her peers. Salomon continues[274]:

> *"We live in a world from birth to death of persons and things which in large measure is what it is because of what has been done and transmitted from previous human activities. When this fact is ignored, experience is treated as if it were something which goes on*

[272] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children's Thinking, a Sociocultural Approach*, pp. 124, London and New York: Taylor & Francis Group, Routledge.
[273] Perkins, D. N. and Salomon, G., 1992. *Transfer of Learning, International Encyclodaedia of Education,* 2nd edition, Oxford, England: Pergamon Press.
[274] Salomon, G., 1997. *Distributed Cognitions: Psychological and Educational Considerations*, Cambridge University Press.

exclusively inside an individual's body and mind. There are sources outside an individual which give rise to experience…".

(Salomon, 1997)

Yvonne Rogers, (2006) wrote for the Encyclodaedia of Language and Linguistics; "Distributed Cognition and Communication". She explains that distributed cognition is the distribution of problem solving in a collaborative working environment. The way people work together involves the role of verbal and non-verbal behaviour, such as: what they say and do not say, what is implied by their body language, i.e. glances, winks, or nods etc. Besides, many coordinating mechanisms such as rules and procedures are used. Thus, various methods of communication take place as joint activity that progress mutually for knowledge sharing and accessing. Rogers cites Hutchins' (2000) claims that cognition is better understood as a "distributed phenomenon". For example, individuals participating together in an activity possess diverse kinds of knowledge. The processes of interaction and engagement allow them to pool various resources in completing tasks. The collaboration of knowledge enables people to share experiences and accomplishments. Hence, the process of distribution of cognitive in memory, decision making, inference, reasoning, learning, and so on take place. These cognitive processes characterise dissemination and transformation of coordinated actions and information for sharing. (Rogers, 2006)[275]. In explicating Hutchins' claims, Rogers wrote[276]:

"*He suggests that the same conceptual framework be applied to larger 'cognitive systems', namely, those where there are multiple people interacting with each other and a range of artefacts to perform an activity. Part of the rationale for this extension is that, firstly, Hutchins believes it is possible to determine the processes and properties of such cognitive systems more reliably – since they can be observed directly in ways not possible inside a person's head – and, secondly, they may actually be different and thus unable to be reduced to the cognitive properties of an individual".*

(Rogers, 2006)

[275] Rogers, Y., 2006. *Distributed Cognition and Communication, The Encyclodaedia of Language and Linguistics,* 2nd edition.
[276] Rogers, Y., 2006. *Distributed Cognition and Communication, The Encyclodaedia of Language and Linguistics,* 2nd edition.

Roger's argument reflects Vygotsky's concept of ZPD. Vygotsky emphasises the various sociocultural structures and their impact on the interactions between individuals, artefacts, technology and environment. Vygotsky asserts that teaching is stimulated by insightful development and subsequent learning. He argues that teaching means providing advancement to the learner, socially elaborated human knowledge and cognitive development. Cognitive development is something for which learners must put their own reflective and internal strategies to work. Vygotsky named the "actual developmental levels" which characterise mental development retrospectively. Simply put, if a child can do such-and –such independently it means the functions have already matured in the child. And, the ZPD is the assistance provided to the child when he or she cannot do such-and-such independently.

The above arguments describe the link between ZPD and Distributed Cognition. Distributed Cognition stems from the notions of ZPD that characterised children's cognitive development. Basically, these two theories involve observations through a period of time to nurture children's actions and reactions. Children's cognitive development process, Vygotsky argued is a process of 'telescopes changes'. Telescope changes are observing the process of children's actions and reactions. (Cole, et al, 1978) [277]. For example, we take the memory and the sign-using activity process in children as I have already explained in the last section. Vygotsky shows the higher psychological processes of memory in children by demonstrating that there is a link of mediated activity in between the goal and the reaction. In order to produce something children react. Vygotsky considers Talk or speech to be the mediated activity or what he called the supporting stimuli. Speech is crucial in the development of a child to reach his or her goal. Vygotsky argued that through such stimuli, a child would be able to see the immediate situation and react upon it. Vygotsky describes it as 'active human intervention' (Cole, et al., 1978)[278]. Vygotsky claims that these supporting stimuli are for children a means of active adaptation. The supporting stimuli are highly diverse and include the tools of the child's culture, the

[277] Cole, M., John-Steiner, M., Scribner, S. and Souberman, E., 1978. Vygotsky, L.S. *Mind in Society: the Development of Higher Psychological Processes*, pp.12, Cambridge MA: Harvard University Press.
[278] Ibid, pp. 122-133.

language of those who relate to the child and the ingenious means produced by the child himself, including the use of his own body (Cole, et al., 1978) [279].

The role of Play in Children's Development by Vygotsky

Vygotsky claims that play advances the development of a child. Play is important to children – they satisfy certain needs in play by using their imaginations and acting out their desires immediately. Vygotsky argued that children perform as an adult character during play. They act out the activities of their culture and rehearse any future roles and values that they admire. Vygotsky explained[280]:

> *"The child sees one thing but acts differently in relation to what he sees. Thus, a condition is reached in which the child begins to act independently of what he sees".*
>
> (Cole, et al., 1978, p. 97)

Vygotsky asserts here that everyday situations in a child's behaviour are the opposite of his behaviour in play. He claims that during play, a child's actions are subordinated to meaning, but in real life, action dominates meaning. In play, a child always behaves beyond his or her age, above himself or herself. All children's developmental tendencies are condensed and contained in play. So, in play, children's development can be compared to instruction. Vygotsky further claims that play provides a much wider background for changes in needs and consciousness. Children's action in play is their imaginative sphere of the world where they create the voluntary intentions, i.e. they act as a doctor, a teacher or someone they looked-up to. The creation of voluntary intentions such as those mentioned, could affect the formation of their future real-life plans and desirable motives. Desirable motives are the imagination of the roles that they play. Here, I provide an example, being a doctor, children play with the doctor's first aid kit, one of them acts as a patient, the doctor is looking after the patient, and so on. Vygotsky claims that play, moves children forward significantly and is the highest level of their

[279] Ibid, pp. 123.
[280] Ibid, pp. 102.

preschool development. Therefore, play is considered a leading activity that determines the child's development (Cole, et al., 1978)[281].

Vygotsky argued that human activity transforms both nature and society. During preschool and school years the conceptual abilities of children are stretched through play and the use of their imagination. The play-development relationship is not like an instruction - development relationship. Play gives a broader background for changes in needs and consciousness to children[282]. By the early age of human development, they have already experienced the tension beween desires that can be fulfilled only in the future and is something that demands immediate enjoyment. Through play this contradiction is explored and temporarily resolved. Here, Vygotsky places imagination as representing a specifically human form of conscious activity. It arises from the action in play.

Play in the current school context

L. Naismith, P. Lonsdale, G. Vavoula, and M. Sharples, (2005) in a report submitted to Nesta FutureLab Series, UK argued that children at school and at home anywhere in the world are benefiting from mobile technology to facilitate learning and leisure [283]. This work is highlighted in this study in order to relate its findings to children's cognitive, ICT, higher order thinking skills. The findings are from the work of R. Sandford, M. Ulicsak, K. Facer and T. Rudd (2006). *Teaching with Games: Using commercial off-the-shelf computer games in formal education,* report for Nesta Futurelab, UK. Naismith, et al. referred to the theory of situated learning which emphasises the role of social interactions in the process of learning. Based on the theory of situated learning and social interaction process of learning, Naismith, et al. examine Vygotsky's sociocultural psychology and the activity theory of Engeström (1987). They examine the effectiveness of learning through games, using a few UK schools as examples. The games used in the schools for this research were: *The Sims 2*, *Roller Coaster*

[281] Ibid. pp. 101-103.
[282] Ibid. pp. 102.
[283] Naismith, L., Lonsdale, P., Vavoula, G., and Sharples, M., 2005. Literature Review in Mobile Technologies and Learning, *Report 11, Nesta Future Lab Series.*

Tycoon 3 and *Knights of Honor* (Naismith, et al., 2005) [284]. The curriculum was explicitly designed to develop the skills of independent students so that they met the needs of young people in the current century, as opposed to a traditional information-driven curriculum such as the National Curriculum. The needs of the new curriculum focus on skills and competencies broadly focused on learning, citizenship, relating to people, managing situations and managing information. The findings showed learning improvements of pupils' motor/cognitive skills (91%), ICT skills (77%), higher order thinking skills (63%), and knowledge in a particular area (62%). Social skills were seen to benefit by 17% of teachers, however, 71% of them believe that playing such games could lead to anti-social behaviour, while 62% think it leads to stereotypical views of other people or groups. More than two-thirds (69%) say that it improves computer skills, while roughly half (53%) think that it would help improve their reactions or problem-solving skills. 24% think that it improves subject knowledge, and the same percentage thinks game-playing improves skills such as working in teams. From the students' point of view, an average of 62% say that they would like to use computer games in the classroom; 89% of these (approximately 55% overall) think it would makes lessons more interesting. Younger students were most likely to want to use computer games in school: 66% of 11 year-olds compared to 49% of 15-16 year-olds. However, 22% of students think such games should not be used in lessons. Half of these students (11% of the sample) say that they would prefer to do other activities in the classroom, while more than a third of this group (8% of the sample) would rather use computer games at home. Amongst all students, there are a number of perceived benefits of playing computer games outside lesson times.

Another example of game play research by Price and Rogers (2004) argues that 'physicality' leading to a 'brains-on' type of learning has the potential to develop a child's mind and extend their learning activities. One example would be combining physical movements such as manipulation of real world objects, gestures and body posture changes, with higher order

[284] Sandford, R., Ulicsak, M., Facer, K. and Rudd, T., 2006. Teaching with Games: Using commercial off-the-shelf computer games in formal education, *Report for Nesta Futurelab*, UK.

cognitive activities, such as thinking, reasoning and reflecting (Price & Rogers, 2004)[285]. This rationale is based on a fundamental development theory asserted by Bruner, (1973). Bruner argues that effective cognitive learning happens when meaning is taken from experience with the world. He asserts that children discover what is going on in their own heads through their own experiences[286]. Vygotsky argued that human activity transforms both nature and society. During preschool and school years the conceptual abilities of children are stretched through play and the use of their imaginations. The play-development relationship is not like an instruction - development relationship. Play gives a broader background for changes in needs and consciousness to children[287].

Conclusion

Vygotsky highlights sociocultural structures and their impacts on the interactions between individuals, artefacts, technology and environment. Vygotsky asserts that teaching is stimulated by insightful development and subsequent learning. Price and Rogers claim that children must be provided with advancement, socially elaborated human knowledge and cognitive development. Teachers are the facilitators for children's cognitive development so that children can put their own reflective and internal strategies to learn and to discover the environment. Price and Rogers describe children's physical engagements as something that creates an involvement and activeness in learning. This way, Price and Rogers claim that children have increased their cognitive development levels of motivation and interest in the activity or learning context.

[285] Price, S. and Rogers, Y., 2004. Lets Get Physical: The Learning Benefits of Interacting in Digitally Augmented Physical Spaces. *Computers & Education 43,* 2004: pp. 137–151.
[286] Bruner, J. S., 1973. *Going Beyond the Information Given,* pp. 72, New York: Norton.
[287] Ibid. pp. 102.

Conclusion

The arguments show that children's speech is socialised speech that stimulates social interactions, talk, arguments and discussions, all of which would develop learning among children. In today's digital age, children communicate or socialise using interactive technological devices and other social media for social networking, learning and exploring knowledge. Piaget's ideas on children's social speech give this study the concept of a Talk or Dialogue teaching and learning approach with the use interactive mobile technologies. The social interactions that Piaget illustrates during learning activities, give this study the basis for examining children's social interactions and networking in the age of digital technologies. Children these days socialise with interactive technology devices, which they use to create meaning; i.e. in many different contexts of learning and achievement. Lave, Wenger and Rogoff value the notion of children's speech as their socialised speech and context. This speech gives meaning to children's relationships, psychological and cognitive development. Children represent a community that will go on to adopt the means of living, shaping their own behaviours, nurturing skills and beliefs, learning languages and attitudes.

This chapter also explains in detail Mercer and Littleton's findings on Talk and collaborative learning in the classroom. With this argument, this study relates Talk and learning as a process of children's cognitive development. The section describes how Vygotsky's claims the mediation of the cultural tool of language and social interactions shape children's intellectual development. The use of Talk in the classroom to collectively re-construct and negotiate ground rules is a processes of children's action and reaction. They generate activities that configure and reconfigure a distinctive, inclusive, flexible environment for working together. In the classroom children talking in an exploratory way are simultaneously creating a positive climate of trust and a culture of collaboration. So, in summary, Vygotsky's experiments about children's psychological functions give emphasis to the basic relationship between the natural behaviour and social conditions in which human activity takes place. Vygotsky established that the human species is unique as they change themselves to adapt to

the diverse contexts of culture and history. Human activity is transformed by both nature and society through social interaction. Social interaction is the functional learning system in the development of a child's intellectual cognitive learning which, through his perception, attention, sensory-motor operations and memory, generates speech (Cole, et al., p.124).

Such, high levels of engagement can in turn affect the cognitive distribution of speech, social interaction, ZPD, shared knowledge, play and educational achievements in children. Their attention, inquisitiveness and reflection are all developed in this context.

Chapter 3 – The Case Studies

Introduction

This chapter analyses two published case studies about children's Dialogue or Talk, understanding classroom learning and the use of technological tools. These case studies are examined to underpin the role of Dialogue or Talk, technological gadgets and tools that influence children's social lives and learning expansion. The findings from these two case studies comprise the groundwork for this study's contribution to knowledge about Talk or Dialogue and the use of technological devices stimulate children's psychological learning development. Essentially, this study will examine the findings from both cases by combining the existing arguments with the theory of human psychological functions of perception, attention, sensory-motor operations and memory with the Talk or Dialogue approach and the use of technological devices. The conclusion to this chapter comprises the contribution to knowledge about children's Dialogue or Talk. The interactive technological devices allow children to take part in dialogue, talk, chats, texts, calls and other media. These activities can be seen as extensions of the spontaneous actions that derive from the use of speech, which internalize children's cognitive development. Hence, with the evidence provided by the scholars from the case studies, this study can present the role of Dialogue or Talk to the Malaysian educational system as a significant deliverable teaching and learning method. Children act and react with technological devices contributing to the development of their cognitive and psychological functions.

Managing mobile relationships: Children's perceptions of the impact of the mobile phone on relationships in their everyday lives

Case Study 1

This chapter – the case studies – analyses two case studies from published works in the UK. This section analyses a case study which discusses the use of mobile phones by Emma Bond (2010). Her research was conducted in the UK in 2010 with thirty English school children. The research was on children's use of mobile phones in managing and maintaining friendships and relationships in their everyday lives. Her work has provided important findings on the use of Talk or Dialogue with mobile technology devices that relate to this study's research questions. This study's research questions emphasise two significant problems. Firstly, to what extent does Dialogue contribute to children's cognitive development when experienced through interactive mobile technologies? Secondly, to what extent do existing theories of Dialogue and interaction enable us to understand the shaping of children's intellectual development? Hence Bond's findings are pertinent to this chapter.

This section will be concerned with the theory of Vygotsky (1962) on children and the development of their higher psychological processes and the linkage between the use of social tools and speech. His theory emphasises several psychological functions in the human dynamic system which include perception, memory, sensory-motor operations and attention. This section also examines children's speech, use of social tools, social interactions and cognitive learning development and how they relate to many other theories of Dialogue and children's learning development. The scholars who will be cited are Jean Piaget, Barbara Rogoff, Jerome Bruner, Laurillard, Mercer and Littleton and Gavriel Salomon. Their work on Dialogue, Dialogue and sociocultural development, children's learning approach, learning with technologies etc. have been scrutinised. As a result, this study has compiled four key characteristics that are put together as a Dialogic Framework to examine the two case studies selected.

The Dialogic Framework has four characteristics that unite significant educational theories on children's intellectual development relating to Talk or Dialogue. They are: the dynamic system of human functions as set out by Vygotsky (1962) [288]; the theory of child logic by Piaget (1959)[289]; the theory of enculturation by Rogoff and Jim Wertsch (1990)[290]; and the theory of distributed cognition by Salomon (1997)[291]; The details of the Dialogic Framework are explained in chapter 4.

Thus, the Dialogic Framework will underpin this study's original contribution to knowledge. The contribution is in children's Talk or Dialogue with interactive technological devices that develop their cognitive intellectual thinking for learning achievements.

Overview of Case Study 1

Bond (2010) wrote for the *Global Child Research Journal* and examined English children's use of mobile phones in managing and maintaining friendships and relationships in their everyday lives[292]. Her study took the accounts of thirty young people, 11-17 year-old boys and girls in order to provide a methodological base for hearing and understanding their voices on the usage of mobile phones on a daily basis. The study adopted a social constructivist perspective for its theoretical framework and explored how children use mobile phone technologies and understand risk. Bond claims that risk is an experience within children's social worlds which adults should understand. Adults need to think about to what extent children may be shaped or influenced by mobile phones. Bond adopted Gidden's notion of pure relationships (1999)[293], Goffman's effort on the presentation of self[294] (1959), Berking's, (1999)

[288] Cole, M. John-Steiner, V. Scribner, S. and Souberman, E., 1978. *L. S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes,* E. Cambridge MA: Harvard University Press.
[289] Piaget, J., 1959. *The language and Thought of the child,* 3rd Edition. London: Routledge and Kegan Paul Ltd.
[290] Rogoff, B., 1990. *Apprenticeship in Thinking: Cognitive Development in Social Context,* Oxford: Oxford University Press. Wertsch, J. V., 1985. *Vygotsky and the social formation of mind.* Cambridge, MA: Harvard University Press.
[291] Salomon, G., 1997. *Distributed Cognitions: Psychological and Educational Considerations*, Cambridge University Press.
[292] Bond, E., 2010. Managing Mobile Relationships: Children's Perceptions of the Impact of the Mobile Phone on Relationships in Their Everyday Lives, Childhood 17(4): pp. 514–529, *Global Child Research Journal,* Sage Publication.
[293] Giddens, A., 1999. *Runaway World How Globalisation is Shaping Our Lives.* London: Profile Books.
[294] Goffman, E., 1959. *The Presentation of Self in Everyday Life.* Garden City, NY: Doubleday.

works on the sociology of giving[295] and Ling's (2004) work on mobile phones[296]. These works were analyzed by Bond for her studies on children's use of mobile phones in managing and maintaining friendships and relationships in their everyday lives. Bond argues that the mobile phone is viewed as essential to supporting relationships, offering security, reassurance, and positively maintaining and managing friendships through exchanging texts, pictures and content among children. Her study puts together the notion of mobile phones as a re-contextualization of older media, ideologies and practices in relation to young people's lives which is in line with Goggin and Hjorth (2009)[297] and Livingstone (1998; 2002)[298]. Goggin and Hjorth's research suggests that it is vital to see mobile media as a re-contextualization of older media, ideologies and practices, not just "new" technologies. Goggin and Hjorth claims that children have included the mobile phone as part of their everyday life. Livingstone recommends that it is essential to contextualise technologies with regard to young people's lives. Hence, Bond's findings have demonstrated that the concept of 'context' was vital to how the children actually used mobile phones. Bond wrote that Charlton, et al. (2002) and Yoon, (2003) assert that young people buy and use mobile telephones to contact peer networks. Yoon (2003) argues that young people avoid being excluded from peer communication and mobile communication technologies are strengthening their relationships by face to face meeting. Ling (1999) asserts that mobile phones are important in the micro-coordination of society. In Charlton, et al.'s (2002) study of younger children, they emphasised that children called parents more often than before the ownership. Nearly 40% of the children had used their mobile telephone in a crisis situation. The use of mobile phones, Bond argues that context is crucial to children's understanding of ownership. This could be deduced from their explanations, which depicted a complex group of people, relationships, practices and technologies. According to Goggin and Hjorth (2009), Bond claims that the mobile phone has become an integrated part of

[295] Berking, H., 1999. *Sociology of Giving.* London: Sage.
[296] Ling, R., 2004. *The Mobile Connection The Cell Phone's Impact on Society.* San Francisco: Morgan Kaufman.
[297] Goggin, G. and Hjorth, L., 2009.*Mobile Technologies from Telecommunications to Media.* Abingdon: Routledge.
[298] Livingstone, S., 1998. 'Mediated Childhoods: A Comparative Approach to Young People's Changing Media Environment in Europe', *European Journal of Communication* 13(4): pp. 435–456. Livingstone, S., 2002. *Young People and New Media.* London: Sage.

young peoples' everyday life. Charlton et al. (2002) have shown that non-ownership of the mobile phone limits children's experience and understanding of other communication technologies. Apart from Charlton et al. (2002), Ling (2000) argues that the mobile telephone is associated with privacy, freedom and security.[299]. Bond refers to Leung and Wei, (1999) about non-ownership which also leads to social exclusion. On parental control, Bond cites that Ling (2000), Yoon (2003) and Williams and Williams (2005) underline that the mobile technology extends parental control on young people and young people are also negotiating their parental control. Crabtree and Nathan, (2003) claim that the mobile telephone permits parents to provide their children more freedom.

Bond's study also analyses the limitation of the social world i.e. public space. The definition of public space here includes formal, legal restrictions on where children were allowed to go, as well as parental restrictions on children's participation in and access to public life as argued by Harden (2000)[300]. Bond cites Harden's (2000) argument that public space is defined as adult space and children's participation in public space is controlled and limited. Children are restricted as to where they can go or what they can participate in, and in their access to public life. Bond claims that spatial topics or public space has become controlled and limited by adults in many ways. Holloway and Valentine (2001) highlight the debates about spatiality in childhood that is associated with places – sites in everyday life. The spatial imagery in ideologies of childhood generally was mentioned by Jenks (1996). Jenks (1996) develops Foucault's ideas of spatial control and suggests that the exercise and manipulation of space is a main example of adults controlling the child's world. Bond notes how James, et al. (1998) suggest that the child remains a victim of public space where the outside places are considered risky. Childhood is understood as a social construction that gradually becomes blurred. Bond mentioned Laurier's (2001) ideas about the spaces of childhood changing in late modernity. Laurier (2001) argues that mobile phone use amongst children provides a useful focus for the analysis of childhood spaces, something that is changing as we move forward.

[299] Charlton, T., Panting, C., and Hannan, A., 2002. 'Mobile Telephone Ownership and Usage Among 10- and 11-Year-Olds', *Emotional and Behavioural Difficulties* 7(3): pp. 152–163.
[300] Harden, J., 2000. 'There's No Place Like Home: The Public/Private Distinction in Children's Number Theorizing of Risk and Safety', *Childhood* 7(1): pp. 43–59.

Bond also claims that children viewed mobile phones as creating anxiety and insecurity. Her study summarises the role of mobile telephones with respect to children's friendships, intimate relationships and many other aspects which include bullying. Bond argues that text messaging and the Internet, are part of young people's everyday lives. They text when voice calls are inappropriate. Bond cites Kasesneimi and Rautiainen, (2002) who claim that young people text or chat to represent an 'entire spectrum of human emotions, including intimacy and trust, and expresses adolescents' identification with friends and peers'. Kasesneimi and Rautiainen further claim that children viewed mobile phones as fulfilling their needs emotionally and functionally. For example, gift giving is important to conceptualizing relationships and failure to respond increases uncertainty and insecurity among them. Bond notes that according to Berking (1999) and Maus (1925), mobile phones play an important role in maintaining and managing friendships especially in the form of 'gifting' through exchanging texts, pictures and content among friends. Thus, the notion of power is explored among them. Besides, gift giving also facilitates the young person's status and rivalry in relationships. To strengthen the emotional ties within their friendships, children use mobile phones to communicate with text, pictures and mobile content. Bond's research question highlights how children and young people actually used mobile phones, to manage and maintain their relationships and reciprocity. Bond emphasised the importance of context within that communication as to what was appropriate and expected and what was not, and the risk of mobile phones' more sinister role in relation to less positive behaviours and bullying.

Bond's Research Methodology

In July 2007, a total of 30 children aged 11-17 were encouraged to talk about mobile phones in their own terms. Their narratives exemplify their views and experiences as Christensen (2004), Clarke and Moss (2001) and Grover (2004) have shown. The children who participated in the research were all white and British and comprised 16 girls and 14 boys. However, Bond claims that the sample was very limited in terms of ethnicity and social class. The children were grouped by age into nine group discussions with varying gender compositions. They were from

three different high schools in Suffolk which included a comprehensive high school, a church-aided high school and a private school.

The data from the 30 children were gathered based upon qualitative methodology during unstructured focus group discussions. Ethical considerations were seen as vitally important as the researcher had an enhanced Criminal Records Bureau certificate and was experienced in conducting focus groups and other research methods with children. Consent was obtained from both the children and their parents outlining the nature and details of the project. The children were given refreshments and seated at round tables to ensure a relaxed context for the discussions. The children knew each other well as they were allowed to choose their own friends to form the group. The research was reported as lively and dynamic, with an in-depth rapport between the children and the researcher. They talked about shared experiences infrequent, lengthy and detailed discussions on many diverse topics related to mobile phones.

Thus I relate her findings to evaluate the extent of Talk, Text or Dialogue to interactive mobile technologies and the way it contributes to children's learning development and cognitive intellectualism.

The Results

Finding 1

Cathy [age 17]: you can't have friends without one.

The excerpt shows the theory of Distributed cognition made by Perkins and Salomon, (1992). Perkins and Salomon have articulated the notions of 'shared knowledge' as components of Distributed Cognition. The theory of distributed cognition maintains that learning is a distribution process of the human brain that happens everywhere. Cognition is processed and distributed over people, environment, technologies and the use of tools when interaction happens between humans and their environment[301]. The excerpt above shows that without the use of technological tools such as a mobile phone, Cathy couldn't find friends or have contacts.

[301] Perkins, D. N. and Salomon, G., 1992. *Transfer of Learning; the International Encyclodaedia of Education*, 2nd Edition, Oxford, England: Pergamon Press.

Thus, a mobile phone is a tool that helped her looks for friends and build friendships. Cathy, for example, depends very much on the mobile phones.

Finding 2

Cathy [age 17]: *Yeah and like that's going to be like really important when school's finished because like our real connection is school so to be out of school it's like texting or calling.*

Megan [age 17]: *Yeah our connection is school so if we want to meet up then it has to be like texting or calling and texting is cheaper so if like we want to talk and it's after like 4.30 then it has to be like your mobile.*

These two excerpts show Cathy and Megan's explanation of the use of the devices after school. Both of them text or call their friends with mobile phones to maintain social contacts. Rogoff, (1990) argues that contexts give meaning to content, meaning appears from the relationship between content and its context[302]. Rogoff claims, in social context, children's speech is called socialised speech. Cathy and Megan's speeches are in a specific social process that is derived from their social context. Rogoff asserts that socialised speech implies the cognitive contextualization of the learning and knowing processes which happens during the social process. During this process, there is coordinated activity involved in sharing ideas or problems between partners. Partners continuously maintain interaction, cooperation and interthinking through their activities. These coordinated activities form human's meta-cognition that give meanings to their social relationships, solving problems and learning attainments. Hence, Cathy and Megan learn by knowing something that they have experienced.

Finding 3

Pip [age 14]: *I think that they are important though 'cos we like text each other all the time.*

Becky [age 14]: *Yeah and if we didn't like text each other also they are a way of ruining friendships.*

Laura [age 14]: *They are.*

[302] Rogoff, B., 1990. *Apprenticeship in Thinking: Cognitive Development in Social Context,* Oxford: Oxford University Press.

Becky [age 14]: *Because you can use mobile phones to like . . . It's like they can ruin friendships because if you don't text back or if someone doesn't like text you back that really annoys me.*

Laura [age 14]: *And you can get arguments on your mobile phone a lot.*

Becky [age 14]: *Yeah I think we use our phones a lot for that.*

Pip [age 14]: *Yeah it creates a lot of worry as well – 'cos you are like . . .*

Laura [age 14]: *Yeah paranoia, paranoia.*

These excerpts reveal Lave and Wenger's (1991) 'situated cognition' as "Enculturation". Lave and Wenger maintain that situated cognition interprets thinking as never exactly the same for any two individuals or in any two contexts[303]. Thinking is embedded in the context of the task or activity at hand which then draws on social, cultural, and material resources. These excerpts show that Pip, Becky and Laura have the ability to reason the issues of the use of Text and Talk between them. It seems that they are committed to their relationship values as they claim that the content of the texts or messages have an important meaning to them. They built the rapport between them to show that they care for each other. The explanation made by Pip, Becky and Laura show the development of their cognitive thinking is internalised through the use of Text, Talk and Dialogue for friendships and relationships. Pip, Becky and Laura's opinions about the use of mobile phones reflect the situated learning as "Enculturation" of their behaviour, skill and attitude about the use of the devices as a mediator in their friendships. The process of Text or Talk is the social context. The "Enculturation" is embedded in the context that draws upon social networking and cultural relations with peers or classmates. The feeling of worry and paranoia that they claim, defined the assertions made by Bruner. Bruner writes: "The development of one's cognition is not in his or her mind alone, but it involves his or her relations to something." Bruner (1985) asserts that the cognitive processes do not exist in one's mind but involve relations between an individual and a situation[304].

[303] Lave, J. and Wenger, E., 1991. *Situated learning: Legitimate peripheral participation*. New York: Cambridge University Press.

[304] Bruner, J.S., 1985. *'Vygotsky: a Historical and Conceptual Perspective'*, in J.V. Wertsch (ed.) *Culture, Communication and Cognition: Vygotskian Perspective,* Cambridge: Cambridge University Press.

Finding 4

Kev [age 15]: *Have you ever got into like a really huge texting back and forth?*

Josh [aged 15]: *I have but it gets quite frustrating actually.*

Kev [age 15]: *It must be about the most pointless thing.*

Josh [age 15]: *The thing is it's like there's no way an awkward silence can happen or anything because you can just sit there re-drafting what you are going to say about a billion times 'cos you are so scared of ever saying anything wrong.*

Andy [age 15]: *Yeah you can't make anything sound offensive that way.*

Kev [age 15]: *So do you put a lot of thought into what you are going to say?*

Josh [aged 15]: *Yeah especially if it is like something important yeah but a lot of the time it is just like 'where are you?' or something like that; but yeah if you have got something then you can spend quite a lot of time thinking about it and like you know if you are texting someone about like a relationship or something like that and if you have got friends round then you are like 'does this sounds good?' or whatever.*

The excerpt shows that Josh, Kev and Andy were concerned with their conversation and the impact that it would cause to their relationships. For example, when the boy named Kev questions Josh about the thought that Josh has to put in when he texted. Josh explains that there were occasions when he has to put a great deal of thought into it. In the Child Logic theory by Piaget (1920), Piaget describes that logic and language are interdependent, children's speech communicates their thoughts. Piaget claims that from the social point of view, the significance of children's sentences or fragments of sentences are remarkably varied i.e. Egocentric speech, repetition, monologue and collective monologue. It explains the feelings of self-confidence and openness in a child to speak[305].The excerpt also explains the Vygotsky's theory of the dynamic system of human function – that language and perception are concurrent at a very early stage of development (1930)[306]. Vygotsky claims that the immediate response of children's normal perception is banished by an intricate mediated process of their speeches. Speech became an

[305] Piaget, J., 1959. *The language and Thought of the child,* 3rd Edition. London: Routledge and Kegan Paul Ltd.
[306] Vygotsky, L.S., 1960. *The History of the Development of Higher Psychological Functions.* In Development of Higher Psychological Functions, pp.13-223. Moscow: Academy of Pedagogical Sciences, RSFSR, edited by Cole, M. John-Steiner, V. Scribner, S. and Souberman, E. (1978) *Editors' Preface, L. S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes,* Cambridge MA: Harvard University Press.

important part of the children's reasoning development. Consecutively, at the next stage of children's development, their speeches need a combining function that is helpful to them in achieving a more difficult form of cognitive perception[307]. This explains how children go on developing speech which will access, process and provide the necessary results.

With regard to Josh, Kev and Andy's feelings of fears, frustrations and worries, Josh explains, there were times when he has to text back and forth many times due to some misunderstandings over the text. He got scared of ever saying anything wrong because it would jeopardise the relationship. Josh's statements reflect the Egocentric speech as claimed by Piaget in the Child Logic theory. Piaget argued that a child's speech is sometimes stimulated by the audience. In the Collective Monologue mode, sometimes, Piaget asserts, a child talks to specified persons with the object of making them listen and understand. Piaget also claims that a child's speech can be more subjective, consisting of commands, expressions of derision and assertions of personal superiority. Piaget also claims that sometimes the child associated his or her speech with the action or thought of that moment; the child is not expecting his or her speech to be attended to or to be understood. So, Josh's texts can be subjective as he may contend with the expression of commands or assertions of personal superiority. Piaget concludes that children's speech is 'self-satisfied'. Josh can be remarked as self-satisfied with the back and forth texts. Piaget argues that children sometime continually announce their plans to themselves, which signifies their 'imaginative exuberance'. The kind of imaginative thinking in them[308].

Finding 5

David [age 14]: *That's because we all use your phone as well.*

Shaun [age 14]: *Then I get into even more trouble. I mean mine's just the communal phone.*

Kate [age 15]: *Yeah well we all share all our phones with each other.*

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[307] Vygotsky, L.S., 1960. *The History of the Development of Higher Psychological Functions.* In Development of Higher Psychological Functions. pp.13-223. Moscow: Academy of Pedagogical Sciences, RSFSR, edited by Cole, M. John-Steiner, V. Scribner, S. and Souberman, E., (1978) *Editors' Preface, L. S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes,* Cambridge MA: Harvard University Press.

[308] Piaget, J., 1959. *The language and Thought of the Child,* pp. 1-49, 3rd Edition. London: Routledge and Kegan Paul Ltd.

These excerpts show the 'social interaction' and 'the use of social tools' by Shaun, Kate and David. The conversation reflects the Vygotsky's theory of social interaction and the use of symbolic tools from social culture. Vygotsky claims that resources from society or cultural tools are available for children to utilise. The symbolic tools, for example: sense-making, participation in the cultural life, using artefacts, using technologies and joining in ritual activity with others[309]. In this case, the use of mobile phones and the spirit of co-operation, sharing and playing with the devices between them.

Also, the excerpts explain Piaget's argument that children can explore how the world works and thus build personal and mental representations of it through actions (1920)[310]. One of the participants, Shaun, was prepared to take the risk of sharing his phone with his friends. The excerpt shows cultural interaction, friendship bonding and learning new things with artefacts available on the mobile phones. With the information tools built into mobile phones, these children communicate and exchange materials i.e. pictures, video and audio clips, file documents etc. These children are building informal experiences with personalised files being shared between them. Hence, their movement and context is accessible and fulfilled after school. Mobile phones help to structure these children's time and space, support or constrain their interactions. Text, images, moving objects and sound are resource content-based artefacts that children are fascinated about and use to diligently explore the devices. This has sustained Vygotsky's argument (1962) that the interpersonal interactions which occur in learning settings and cultural psychology rely on the intercession by social, cultural and institutional processes at many stages[311]. Vygotsky argues that the construction of knowledge and understanding is naturally a social activity (1962). Children participate in the cultural life of the community, using artefacts, technologies and much more, with others. By doing so, they slowly make sense

[309] Cole, M. John-Steiner, V. Scribner, S. and Souberman, E., 1978. *Editors' Preface, L. S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press.
[310] Piaget, J., 1959. *The language and Thought of the Child*, 3rd Edition, London: Routledge and Kegan Paul Ltd.
[311] Vygotsky, L.S., 1960. *The History of the Development of Higher Psychological Functions.* In Development of Higher Psychological Functions.pp.13-223. Moscow: Academy of Pedagogical Sciences, RSFSR, edited by Cole, M. John-Steiner, V. Scribner, S. and Souberman, E., 1978. *Editors' Preface, L. S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press.

of the resources of society and their surroundings. The use of social tools and social interaction all leads to the child's cultural development.

These excerpts show Shaun, Kate and David interact and share their phones with each other. The excerpts draw on Piaget's theory on the cognitive development of human understanding, which he termed as 'genetic epistemology'[312]. The term genetic epistemology describes the nature of knowledge and intelligence in humans that explains the course of their development. Piaget argues for the importance of interaction between the child and the physical world where they socialise, go to school and live. Piaget claims that children's intelligence derives from the coordination of their own action in their environment. So, language is a system of symbols signifying the world, it is distinctive in actions and operations that form the processes of reasoning in children[313]. Through children's actions, Piaget claims that children can explore many things that they are curious about such as how the world works etc. When children discover what they wanted, they will then build personal and mental representations of what they have found.

Finding 6

Tilly [age 16]: *Yeah like that's what girls do – like girls take pictures on their phones of all their friends and then they like send them to all their friends so we've all got like pictures of everyone on all our phones – so you've got like a picture of all your friends – but I think girls use their phones differently.*

Vygotsky argues that the construction of knowledge and understanding is naturally a social activity (1962). In Vygotsky's theory of play, he claims that play gives a broader background for changes in needs and consciousness for children[314]. A child comes across the world-to-be-learned-about through his or her interactions with people surrounding him or her. Children participate in the cultural life of the community, using artefacts, technologies and much more with others. By doing so, they slowly make sense of the resources of society and their

[312] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children's Thinking, A Sociocultural Approach*, London: Routledge.
[313] Wood, D., 1998. *How Children Think and Learn: The Social Contexts of Cognitive Development*, Oxford: Blackwell.
[314] Ibid. pp. 102.

surroundings. A girl making use of the tools and materials of the mobile phone for social interaction with friends echoes Vygotsky's theory of play. Vygotsky argued that children perform as an adult character during play. They act out the activities of their culture and rehearse any future roles and values that they admire. Vygotsky explains[315]:

"In play a child is always above his average age, above his daily behaviour, in play it is as though he were a head taller than himself".

All children's developmental tendencies are condensed and contained in play. So, in play, children's development can be compared to instruction. Vygotsky further claims that play provides a much wider background for changes in needs and consciousness. In play, children's imaginative sphere of the world went beyond their surrounding. They have the ability to create voluntary intentions. The creation of voluntary intentions could affect the formation of their future real-life plans and desirable motives. Desirable motives are described as the imagination of the roles that they play. The excerpt illustrates that Tilly acts as an adult by posting pictures and sending her pictures to her friends. She creates the voluntary intentions by keeping her friends' pictures to represent the value of friendship. This way, Tilly provides a wider background for her own changes in needs and consciousness. Tilly's actions show voluntary formation of her future real-life plans and the desirable motives of friendships and relationships. These activities resonate with Vygotsky's statement that play is considered a leading activity that determines the child's development. When a child plays, he or she desires something new that relate to a fictitious. "I" is their roles and rules, therefore they achieve the greatest possible actions and meaning that will lead them in the near future. (Cole, et al., 1978)[316].

Finding 7

David [age 14]:	*Yeah it's like we all go to each other's phone but that's like OK.*
Kate [age 15]:	*Yeah it's not like we're complete strangers.*

[315] Ibid, pp. 102.
[316] Ibid. pp. 101-103.

Shaun [age 14]:	*Yeah it's like your friends go 'Can I go through your phone?' and it' like at least they ask and that.*
Kate [age 15]:	*Yeah it's like they ask about reading your messages and stuff so it's OK if I say so and that.*

The excerpts explain the trust and mutual understanding between the children to use the phone for their own personal reasons or sharing the messages that are available between their close friends. The excerpts show the concept of trust in some ways relates to Vygotsky (1962). Vygotsky argues that learning requires involvement and the support of others. In this case Shaun, David and Kevin are interacting and socializing with friends implying the process of their development with the support of others. Vygotsky claims that children's behavioural development requires the societal context in which they interact and socialise. Children act and react in relation to their surroundings, culture, attitudes and so on. The excerpts show that the three of them are in the societal context of the use of the technological devices. Furthermore, the behaviour that Vygotsky highlights shows that Shaun, Kevin and David act or react in relation to their surroundings, culture, attitudes, psychology, values and so on. The sharing of mobile phones in the excerpt also signifies the notion of shared knowledge in Distributed Cognition. Perkins and Salomon, (1992) argue that learners find relationships between different information, fields of study and basic concepts when nurturing connections in deciding what to learn and how to deal with the shifting nature of information[317]. With the use of social tools, speech in due course produced intellectually-productive work[318]. Shaun, Kevin and David are sharing knowledge with the mobile phones explicating the distributed cognition. With the use of mobile phones, they produce text, talk etc. which will result in intellectual productive work such as accomplishing the given task, solving a problem or creating a specific plan. Therefore, a broader range of activity will be achieved by Shaun, Kevin and David.

Finding 8

[317] Perkins, D. N. and Salomon, G., 1992. *Transfer of Learning; the International Encyclodaedia of Education*, 2nd Edition Oxford, England: Pergamon Press.
[318] Cole, M. John-Steiner, V. Scribner, S. and Souberman, E., 1978. *L. S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, pp. 25, Cambridge MA: Harvard University Press.

Becky [age 14]: *I'll admit that I have sent nasty text messages off my phone to hurt people.*

Laura [age 14]: *I have.*

Becky [age 14]: *I think everyone does it.*

The excerpt shows that Becky and Laura admitted making offensive calls too. Becky admitted that she sent nasty text messages to hurt people and she claims that everyone does it. Laura admitted the same. Vygotsky argues that children's speech and actions are part of the same thing and the interaction through their conversation (external stimuli) is directed toward the solution that the child is going to solve immediately. As Vygotsky puts it:

> *"The complex psychological function describes the interactions (external stimuli) that the child gains from his or her surrounding with peers and adults develops their inner organization of thought (internal stimuli). Speech has developed the social communication which mediates and regulates the child's activity. Those thoughts in turn are mediated by the semiotics (the meaningful signs) of inner speech"*[319].
>
> (Vygotsky, 1930)

Vygotsky claims that thinking is mediated by language that develops a higher level of complexity. Complexity is the higher psychological functions (HPF) of perception in children. The HPF is the process of the child internalizing what they perceive and then reacting to it. This describes the child as being able to use his or her attention, sensory-motor operations or memory relating to the problem. A child may engage with, and respond to the problem at hand. Speech has enabled them to focus on the centre of the problem, they act and react by producing speech and other senses in more complex situations[320]. In using technology for example, children encounter talk or speech that is challenging and threatening. For example, Tilly explains that she was the subject of a prank and weird calls but she managed to ignore it by hanging up the phone. William explains about a friend of his who was worried that his girlfriend who would punch him the next day if he did not reply to a text when he had run out of credit. In another situation, Vicky explains that she would get 'pissed off' if she did not get a

[319] Levina, R.E., 1938. for Vygotsky's ideas on the planning role of speech in children, *Voprosi Psikhologii*, 14: pp. 105-115. Although Levina made these observations in the late 1920s, they remain unpublished except for this brief explication. Cited in Cole, M. John-Steiner, V. Scribner, S. and Souberman, E., 1978. *L. S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, pp. 25, Cambridge MA: Harvard University Press.
[320] Ibid. pp. 105-115.

response from a text that she sent. This process of HPF, as Vygotsky claims, relates to the psychological implications of humans' active participants in their own life. Children acquire the resources by which they can competently affect themselves and their world at each stage of the development. Vygotsky's research has shown that even at very early stages of development, perception, language[321], tools, games and play are linked. This unity helps develop children's psychological processes. A child internalises the current situation as their immediate subject matter for analysis. The child then creates and uses supporting activities to overcome the situation. Vygotsky called it the supporting stimuli. These supporting stimuli are humans' interventions which occur to solve tricky situations or problems[322].

My study - Key Question

This study's key question narrows down to the children's cognitive intellectual development with the use of text and talk through technological devices. Firstly, to what extent does dialogue contribute to children's learning development when experienced through interactive mobile technologies? Secondly, to what extent do existing theories of dialogue and interaction enable us to understand the shaping of children's intellectual development?

The discussion

In this study, dialogue is not only a matter of conversation and speech. It is rather a two-way mutually developing relationship between a person and another person, a person and another 'self',[323] or a person and a responsive machine, object or process. It is important for this study to note the concept of 'Shared knowledge' based on Perkins and Salomon (1979). They claim that shared knowledge is not just in the head, but rather, cognition is distributed to many people with the use of social tools when interaction happens. The excerpt shows the use of mobile phones among children at home or outside the home through Text and Talk. The excerpt shows the theory of Distributed cognition as Shared knowledge relates to mobile phones. Perkins and

[321] (note that Vygotsky uses 'language' at times, speech or spoken language simultaneously)
[322] Cole, M., Steiner, V. J., Scribner, S. and Souberman, E., 1978. *L.S. Vygotsky, Mind in Society - The development of higher Psychological Processes*, Cambridge, MA: Harvard University Press.
[323] E.g. an internal monologue both spoken and heard inside.

Salomon argue that learners develop connections between dissimilar ideas, fields of study and basic concepts when experiencing learning; erudition, culture, knowledge, or discovering and dealing with information. Salomon, (1997) asserts that an indispensable feature of learning is that it creates the "zone of proximal development". That is, learning to a child is developed through the interaction that takes place with many people in the family, parents, peers, more capable adults and their surroundings. Thus, a variety of internal and external developmental processes has helped the child to experience and apply to their social relationships with many peoples around them[324]. The ZPD was originally argued by Vygotsky. As we can see in the excerpts, reciprocity, passing pictures, sharing phones, committing to relationships by answering messages and being responsible for helping a friend when needed are all important. Vygotsky stated that the development of children's cognitive thinking is a process of telescoping the changes. Children learn and experience the world by adopting what their parents, teachers or peers do. Although the excerpt did not mention directly the teachers and parent involvement, the excerpt shows the relationship of these children with the societal context. Vygotsky claims that in ZPD concepts, social context influences are core to children as their attitudes and beliefs. This explains the specification of the societal context in which the child's behaviour developed contributes to children's cognitive development. Vygotsky emphasises the importance of individual thought which includes a child's action or reaction through their involvement with society that develops the quality of humans and relationships. And, children experienced and formed the quality of life such as attitude and belief accordingly based on their cultural background.

The conclusion

The activities of sending text messages, using the phone's built in tools to distribute pictures among the girls, having friendships and relationships, developing social relations of feelings such as guilt, happiness, unhappiness, uncertainty, curiosity, pity etc. were documented

[324] Salomon, G., 1997. *Distributed Cognitions: Psychological and Educational Considerations*, Cambridge University Press.

activities. These feelings are regarding social relationships, as Steiner and Souberman say: "Vygotsky shows the psychological implications of the fact that humans are active, vigorous participants in their own existence and that at each stage of development, children acquire the means by which they can competently affect their world and themselves"[325]. That said, this thesis finding shows that children are continually developing themselves. These children have obtained the ability to discover new things which shape their lives and the lives of others by participating and sharing resources emotionally and physically. Piaget asserts that the construction of children's own understanding has resulted in the fundamental growth of their cognitive learning development[326]. Piaget claims that children's cognitive intellectual development is a matter of their self-active discovery of reality. This means, children are contented with their own continuous discovery within the social and cultural life of the society where they grow and live. Piaget claims that it is the 'intelligence derived from the coordination of actions and operations in the child's environment that forms the processes of reasoning'.

[325] Cole, M., Steiner, V. J., Scribner, S. and Souberman, E., 1978. *L.S. Vygotsky, Mind in Society - The Development of Higher Psychological Processes*, Cambridge, Massachusetts and London, England: Harvard University Press.
[326] Piaget, J., 1959. *The Language and Thought of the Child*, 3rd Edition. Routledge and Kegan Paul Ltd.

Children's classroom learning with dialogue:
The exploratory talk and thinking together approach
Case study 2

Overview

In 2004, Mercer and Littleton worked with children in the classroom for an approach called 'Thinking Together'. The approach was designed to ensure that children have educationally effective ways of talking and thinking together in their repertoires. Mercer and Littleton and their research team actually carried out four main studies in the UK. These studies involved children of three specific age groups: 6-7-year-olds, 9-10 and 13-14 which corresponded to year 2, year 5 and year 8 in the English school system. The research was done in Milton Keynes in the southeast of England and involved 124 children in key comparisons of the quality of children's 'talk'. Indeed, a detailed analysis of observation, video recordings and experiments on groups of target and control children had been done for over 15 years. Most central to this approach is the negotiation between each teacher and class of a set of 'ground rules' for talking and working together. These ground rules were established as a set of principles for how the children will collaborate in groups. For example, there were certain ground rules such as: the high quality of speaking and listening in class is important; the discussion should be comprehensive and respectful of opinions and ideas; all relevant information should be shared; reasons should be requested and given and finally the group should seek to reach an agreement. More detail on this approach was described in several earlier publications; in particular Mercer (2000),[327] Mercer et al. (1999),[328] Wegerif, Mercer, et al. (1999),[329] Dawes (2005),[330] and Littleton, et al. (2005)[331].

[327] Mercer, N., 2000. *Words and Minds: How We use language to Think Together,* London: Routledge.
[328] Mercer, N., Wegerif, R. and Dawes, L., 1999. 'Children's Talk and the Development of Reasoning in the Classroom', *British Educational Research Journal* 25 (1): pp. 95-111.
[329] Wegerif, R., Mercer, N. and Dawes, L., 1999. *'From Social Interaction to Individual Reasoning: An Empirical Investigation of a Possible Socio-cultural Model of Cognitive Development', Learning and Instruction* 9: pp. 493-516.
[330] Dawes, L., 2005. '*Speaking, Listening and Thinking with Computers',* in L. Grugeon, L. Dawes, L. C. Smith and L. Hubbard (eds.) *Teaching, Speaking and Listening in the Primary School*,3rd Edition, London: David Fulton.
[331] Littleton, K., Mercer, N., Dawes, L., Wegerif, R., Rowe, D. and Sams, C., 2005. 'Thinking Together at Key Stage 1', Early Years: *An International Journal of Research and Development* 25 (2): pp. 165-180.

The theoretical framework for the case study

Mercer and Littleton refer to Brigid Barron (2000) in their book *Dialogue and the Development of Children Thinking, A Sociocultural approach*, 2007[332]. Barron, (2000) argues that collaboration with others is being capitalised on more openly in school and work settings, in situations that call for an intense technical understanding of the team members' interaction and written solutions to a problem. Barron claims that in the 21st century, new organizational workplace structures depend on team-based projects[333]. For a collaborative kind of learning and working environments in the classrooms, the use of Talk or Dialogue between teacher and children is useful. For children, learning occurs through interaction with peers in schools. She claims that new learning arrangements will lead to deeper engagement in the subject matter and will facilitate a sense of agency. This could be done through substantial accomplishments from collaborative work. In her later research for her project with children, Barron emphasises the interactive processes among group partners and the relationship of collaborative work to problem-solving results. They were investigated in two different groups. She reported that the case study groups were selected for vigorous differences in the quality of their written solutions to a problem. This section contributes important findings to this thesis about children's Talk or Dialogue with their teachers in the classrooms while learning. The discussion and talk among them provide valuable recommendations for this thesis to understand the level of teachers' conversations with children. Moreover, the importance of the response of children while interacting with teachers in understanding the learning subject will provide useful guidelines to this thesis.

The results of his research showed that one of the groups had shown correct proposals were generated, confirmed, documented, and reflected upon after the exercises. However, in the other group, Barron claims that their proposals were generated, but had been rejected without rationale and for the most part it was left undocumented. Hence, his analyses identified three major dissimilarity dimensions in group interaction. They were: the mutuality of exchanges, the

[332] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children Thinking, A Sociocultural Approach*, Abingdon, Oxon: Routledge.
[333] Barron, B., 2000.'Achieving co-ordination in collaborative problem solving groups', *Journal of The Learning Sciences* 9 (4): pp. 403-436.

accomplishment of joint attention engagement and the coalition of group members' goals for the problem-solving process. Barron argues that a focus on group-level qualities presents an exclusive strategy for examining small group learning. Barron's research was conducted for a group of people to examine the achievement of group coordination on collaborative problem solving. Barron claims that although individual learning is identified as the measurements of success, many studies were done to evaluate the efficacy of cooperative arrangements. Mercer and Littleton value Barron's findings for the research on children's collaborative learning approach in the classroom. This is significant to the children's group works in the classrooms with teachers as Barron argues. In her earlier research, Barron argues about Cohen (1994); Webb and Palinscar (1996) claim that research shows that on average, group work produces more improved learning outcomes than individual work. Studies also demonstrate the interactive processes that lead to learning outcomes. There is evidence that multiple kinds of processes relate to learning outcomes. Also, the study covers ways of understanding the reasons for the unpredictability of outcomes in collaborative projects. These measurements are useful in informing the design and assessment of collaborative learning achievements.

Similarly, Mercer and Littleton mention Martin Nystrand, (1986) and his work on children's collaborative learning. Nystrand argues that a coordinated joint type of collaborative learning environment helps in the sharing of ideas, understanding, support and the continuous (re) negotiation of meaning[334]. A varied academic skill in teachers appears to be a reasonable means of organizing a student body in grouping activities. Grouping students' activities leads to segregation on academic and non-academic criteria and distinguished instruction may lead to dissimilar results for the students.

Mercer and Littleton cited many other scholars' work on collaborative learning in the classroom. For example, J. Ryder and L. Campbell, (1989) argued that participants in collaboration may well experience 'group sense' or a feeling of shared endeavour[335]. Rogoff,

[334] Gamoran, A., Nystrand, M., Berends, M., LePore. P., 1995. An Organizational Analysis of the Effects of Ability Grouping, *American Educational Research Journal*, Vol. 32, No. 4: pp. 687-715.
[335] Ryder, J. and Campbell, L., 1989. 'Groupsense: When Groupwork Does Not Add Up to "Groupwork"', *Pastoral Care in Education* 7 (1): pp. 22-30.

(1990)[336] and Wertsch, (1991b)[337] termed this activity 'intersubjectivity', as the collaborators create and sustain the relationship of a shared idea of the task or problem. Participants in the collaboration group permit the continual preservation of 'intersubjectivity' as they progress through the activity. They interact, cooperate and 'interthink' a task or problem. These skills are important to children's learning in the classroom when the use of Talk or Dialogue is emphasised between children and teachers. Children's participation in the classroom's activities is crucial to their learning development. They interthink in order to solve problems, which means helping them to be able to express their thoughts together by Talk or Dialogue, rather than individually needing to provide their own thought in solving the problem. This process of interthink together can boost their confidence, share ideas and help them voice-out their opinions by discussing with partners.

Mercer and Littleton cited Barnes and Todd (1995). They argue that knowledge can be treated by learners as an exchangeable commodity[338]. That is, the responsibility is in the individual's hands which changes the nature of that learning and how they negotiate their own criteria of relevance and truth. Barnes and Todd assert that pupils prefer teachers not to appear in the discussion and that argument takes place in the classroom. Pupils are more likely to engage in open, broad discussion and argument when they are communicating with their peers. 'Talk' made the children take charge of the ownership of knowledge. Children become more active and independent in voicing their opinion. Actually, the earlier efforts of Barnes, (1976) and Barnes and Todd, (1977) debating the educational importance of Exploratory Talk found it officially endorsed in British education, in the Bullock Report[339]. Therefore, Mercer and Littleton built on Barnes and Todd's 1990s data project on the analysis of the SLANT (Spoken Language and New Technology) for the 'Exploratory talk' learning approach. The project emphasises the disengagement between 'what is' and 'what could be' in relation to children's

[336] Rogoff, B., 1990. *Apprenticeship in Thinking: cognitive development in social context.* Oxford: Oxford University Press.
[337] Wertsch, J. V., 1991. *'A Sociocultural Approach to Socially Shared Cognition',* in L. B. Resnick, J. M. Levine, and S. D. Teasley (eds.) Perspectives on Socially Shared Cognition. Washington: *American Psychological Association.*
[338] Barnes, D and Todd, F., 1995. *Communication and Learning Revisited*, Portsmouth, NH: Heinemann.
[339] Barnes, D., 1976. *From Communication to Curriculum*, Harmondsworth: Penguin Books, Barnes, D and Todd, F., 1977. *Communication and Learning in Small Groups*, London: Routledge and Kegan Paul. Department of Education and Science., 1975. *The Bullock Report*, London: HMSO.

talking and working together in a classroom setting. Thus, Fisher, (1993) and Mercer, (1995), devised a three-part typology of talk, namely: the Disputational talk, the Cumulative talk and the Exploratory talk. These talks reflect the different ways children's talk in the classrooms. The Disputational talk for example is characterised by disagreement and individualised decision-making, pooling resources, offering constructive criticism or making suggestions. It also has some characteristic discourse featuring short exchanges made up of assertions and challenges or counter-assertions such as 'Yes, it is.' 'No, it is not!'. Slightly differently, Cumulative talk is characterised by repetitions, confirmations and elaborations, in which presenters build positive arguments, however without judging critically what the others have said. Partners in this case use talk to build 'common knowledge' by accumulation[340]. Significantly, the Exploratory talk is characterised by partners' engagement, sharing constructive ideas with each other, joint considerations of statements and suggestions, challenging and counter challenging with justifications and offering alternative hypotheses. Thus, partners actively participate; opinion is sought and considered before decisions are jointly made. Distinctively, the Exploratory talk explains how knowledge is made individually accountable and reasoning is noted.

The documented Exploratory Talk by Mercer and Littleton

Below is an excerpt of the Exploratory talk approach from Mercer and Littleton, 2007[341]. The excerpt is selected for this thesis contribution to knowledge on children's cognitive intellectual learning development. This excerpt is reproduced from the Thinking Together program to help the readers understand about the Talk approach of teaching and learning. The Talk was recorded in a classroom in Milton Keynes in 2004, between a teacher and a group of 10-11 year-old school children. The activity, which was designed to enable the children to practice reasoning together by using ground rules, focuses on deciding which set of pet animals

[340] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children Thinking, A Sociocultural Approach*, pp. 58-59, Abingdon, Oxon: Routledge.
[341] Ibid. pp. 75-76.

is right for a particular set of owners. As documented, the teacher intervened after listening to one group in her class talk for a short time. She approached the group and joined the discussion:

Sequence 1: 'Which dog?'

Teacher:	*Who are you trying to find a dog for at the moment?*
Robert:	*Mrs Jenkins.*
Teacher:	*Mrs Jenkins. Right. What do you know about Mrs Jenkins, Jane, so far? (Jane does not respond) You read it out to everybody?*
Michael:	*Yeah.*
Teacher:	*Right. What do you know about Mrs Jenkins so far? Who can tell me something?*
Heidi:	*She's got a small home and a tiny garden, so she can't have a big dog.*
Teacher:	*No, that wouldn't be sensible, would it?*
Michael:	*And she can't. And she can't walk very far.*
Teacher:	*Ah right.*
Michael:	*So it has to be a very lazy dog.*
Teacher:	*(laughs) Oh right! Good boy.*
Robert:	*Sits by the fire. Look! (points to a dog card)*
Teacher:	*Have you got a lazy, small dog?*
Jane:	*We were thinking about Fifi. (points to Fifi's card)*
Heidi:	*But this one – to be patted.*
Robert:	*I think this one – to be patted.*
Teacher:	*Why do you think that one? What's your reason?*
Robert:	*Well to, it was like, laying down, so that the lady could reach it.*
Teacher:	*(Reading) Running and snow. It dislikes running and snow. It dislikes running, so yes, it would be quite a quiet dog. It likes to be patted by an old lady. That's quite a good reason. Why did you want Fifi, Jane? What were your reasons?*
Jane:	*(Silent) Another child contributes inaudibly.*
Teacher:	*(looking at Jane) Can you remember? What did you think about that one? Pick up Fifi and have a look. Is there a reason that you chose that for Mrs Jenkins?*
Jane:	*Cos Mrs Jenkins has got a small garden and she needs a little dog.*
Teacher:	*And you think Fifi's a little dog?*
Jane:	*Yes.*
Teacher:	*Yes, she does look little, doesn't she?*

(Adapted from Dawes and Sams, 2004a, p.105)[342].

The analysis

This above excerpt describes a teacher and children in a classroom discussing the topic of the classroom's lesson. The teacher encourages the children to share some information about Mrs Jenkins and her dog. The excerpts identified the Child Logic theory by Piaget. Piaget (1959) argues that intelligence derives from the coordination of actions and operations in the child's environment that forms the processes of reasoning[343]. The excerpts show that the children communicate their thoughts using the drawing cards to select the right dog for Mrs Jenkins. The excerpt shows that Robert, Michael, Heidi and Jane developed thoughts in the conversation when they watched and selected the cards. With that, they were thinking aloud over the cards and provided the right answers to the teacher. In the sequence, it shows Michael talks before his friends. He talks to specified persons with the object of making them listen and understand. In this case, the audience is there simply as a stimulus factor. Robert, Michael, Heidi and Jane thinking aloud over the lesson with the teacher reflects Piaget claims that "A child is not speaking to anyone as he is thinking aloud over his own drawing, it will be seen the child cares very little who is listening to him. Sometimes, the child sticks to his own idea and is perfectly satisfied"[344]. With that understood, the excerpt indicates Piaget's theory of the collective monologue mode; a child soliloquises when talking to himself, but with the added pleasure of feeling himself as an object of interest to other people. The child is actually thinking aloud over the task that he or she is doing, but and at the same time a child is promoting his or her thoughts to others nearby them. Piaget claims that a child is thinking aloud over his own things. Sometimes the child wants to make himself understood[345].

Secondly, the excerpt reveals the theory of 'higher mental functions' by Vygotsky which relates to thinking, reasoning and understanding in the development of cognitive processes in

[342] Dawes, L. and Sams, C., 2004a. *Developing the capacity to collaborate'*, in K. Lttleton, D. Miell and D, Faulkner (eds) *Learning to Collaborate, Collaborating to Learn,* New York: Nova.
[343] Piaget, J., 1959. *The Language and Thought of the Child,* 3rd Edition, pp. 4, London: Routledge and Kegan Paul Ltd.
[344] Ibid. pp. 1 - 49.
[345] Piaget, J., 1959. *The language and Thought of the Child,* 3rd Edition, pp. 9, London: Routledge and Kegan Paul Ltd.

children. These processes are at the centre of children's developmental processes and how they relate to the use of tools. Vygotsky claims that the linkage between the use of social tools and speech will affect several psychological functions, especially perception, attention, sensory-motor operations and memory. These psychological functions are part of a dynamic system of behaviour in a child. Interestingly, the excerpt shows that these children (Michael, Heidi, Robert and Jane) internalizing their perception, attention, sensory-motor operations and memory to select the right cards and provide the answers to the teacher. Vygotsky argues that perception is the most important part of a dynamic system of behaviour in humans. He explains this utilizing Stern's (1890) theory[346] about the significance of human perception. Stern claims that children see objects before they perceive actions and relate them to the whole picture. Between the ages of five and seven, children's perceptual skills proved to be a product of the limitations of his or her language development. This shows that a child's perception is more dominant than their speech. At a later stage, with 7-12 year olds, Vygotsky (1962) claims that the intellectual mechanisms related to speech obtain a new function[347]. Speech achieves a synthesizing function which is helpful in accomplishing more complex forms of cognitive perception. He claims that the independent elements in a visual field are important. Children then use their speech in sequential processing, associated with a sentence structure, thus making speech essentially analytical. As a result, speech becomes an essential part of a child's own rational resources in adopting the knowledge they have gained to produce intellectually productive work with the use of social tools[348].

Thirdly, in the excerpt, Heidi explains: "Mrs Jenkins has got a small home and a tiny garden, so she can't have a big dog." Then, the teacher says: "No, that wouldn't be sensible, would it?" The conversation continued with Michael and then the teacher followed. Then Michael and Robert took over. In summarizing these conversations, the excerpt illustrates how

[346] Binet, A., 1890. "Perception de'enfants", *Revue Philosophique*, 30, pp. 582-611. Stern, *Psychology of Early Childhood.* Cited in Cole, M., Steiner, V. J., Scribner, S. and Souberman, E., 1978. *L.S. Vygotsky, Mind in Society - The Development of Higher Psychological Processes*, Cambridge, Massachusetts and London, England: Harvard University Press.

[347] Cole, M., Steiner, V. J., Scribner, S. and Souberman, E., 1978. *L.S. Vygotsky, Mind in Society - The Development of Higher Psychological Processes*, Cambridge, pp. 31-37, Massachusetts and London, England: Harvard University Press.

[348] Vygotsky, L. S., 1962. *Thought and Language*, pp.108, Cambridge, MA: MIT Press.

the context of reading the cards together had given meaning to the contents of the required task instructed by the teacher. The excerpt speaks about socialised speech as the "Enculturation" theory by Rogoff. The excerpt demonstrates that the context of selecting and observing the cards gives meaning to the content of the lessons in the classroom. And, the meaning between the teacher and the children in the classroom emerges from the relationship between content and its context. Thus, learning and knowing are apparent as a context of specific social processes between teacher and children. Rogoff claims that socialised speech exposes cognitive contextualization of the learning and knowing processes at the same time[349].

Fourthly, the excerpt illustrates the Distributed Cognition (DC) theory[350]. The conversation and learning among the children and the teacher show the process of interaction and shared knowledge happens between them. DC develops the transfer of knowledge, guidance, socialised speech and learning. The Distributed Cognition as Salomon, (1997) suggests, also creates the "zone of proximal development" between them. Vygotsky claims that concepts of social learning and the 'zone of proximal development' (ZPD) are linked and mutually support children's cognitive development processes[351]. That is, learning stimulates many internal developmental processes that work only when the child is interacting with people in his surroundings and in cooperation with his peers (Salomon, 1997)[352]. Therefore, I summarise that the excerpt shows two processes happening. They are: the social interaction is the external (social) development that is called intermental development, and the internal development is the intramental (cognitive) development. Vygotsky argues that these two developmental processes are the Higher Psychological Functions (HPF) of human functions. The HPF - intermental process in the excerpt is the development of cognitive thinking with the use of social tools and social interactions[353]. The excerpt illustrates the HPF of social interactions among them as their intermental process of HPF. And, these children's behaviours of

[349] Rogoff, B., 1990. *Apprenticeship in Thinking: Cognitive Development in Social Context,* Oxford: Oxford University Press.
[350] Salomon, G., 1997. *Distributed Cognitions: Psychological and Educational Considerations*, Cambridge University Press.
[351] Ibid, pp. 86.
[352] Salomon, G., 1997. *Distributed Cognitions: Psychological and Educational Considerations*, Cambridge University Press.
[353] Ibid, pp. 55.

perception, attention, sensory-motor operations and memory are their intramental processes of internalizing the cognitive development in HPF. Vygotsky asserts that children are able to broaden their activities with the use of social tools.

Conclusion

The extracts above explain children's cognitive intellectual thinking in the form of the Socialised speech, the Distributed cognition, Shared knowledge, the Higher Psychological Processes and the Exploratory talk. It is important to recognise that talk propagates experience which helps children to build up learning. The children deal with each other's opinions, bravely express their own views, raise contentious issues and explore dissimilar possible solutions to subjects discussed in the classroom. Thus, a child gains educational benefits from their experience of learning and discourse in the classroom and this widens the scope of using language to get things done outside the classroom. Hence, children's cognitive intellectual thinking flourishes in voicing his or her ideas with others, as well as accepting criticism during conversation. Talk is an intellectual endeavour which enables children to go beyond what he or she is capable of. Alexander, (2004) claims that when children feel secure in the classroom, children will learn comfortably, securely and clearly rather than feel threatened, at risk and uncertain[354]. Mercer and Littleton claim that children have the ability to develop strategies between them or with their teachers when they interact, cope and engage. Thus, a teacher and children create ways of speaking and listening in a secure and supportive context. The teacher is the orchestrator of discourse who continually works to foster a community of inquiry that both enables and encourages learners (Mercer and Littleton, 2007)[355].

The hypothesis supported by Mercer and Littleton's findings has given this thesis an opportunity to explore the contribution of Dialogue through the use of interactive mobile devices. Interestingly, this study recognises that intellectual cognitive thinking has been used with British school children for many years. That said, cognitive thinking is already developed

[354] Alexander, R., 2004. *Towards Dialogic Teaching: Rethinking Classroom Talk,* Cambridge: Dialogos.
[355] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children's Thinking, A Sociocultural Approach,* London: Routledge.

in schools as the foundation of children's rational thinking. Perhaps children have applied their conversations at school, home and outside school with teachers, peers and colleagues. Therefore, the daily conversation with parents, or the text messages with interactive mobile devices is characterised by these types of talk. This demonstrates that Dialogue through the use of mobile devices such as text messages and conversations has contributed to their cognitive intellectual development already. Hence, the findings from this study is of significant use to the Malaysian education system, where these approaches of teaching and learning have yet to be implemented into the classroom for children's cognitive intellectual development.

Conclusion

In essence, Dialogue or Talk can be proposed as a new approach to teaching and learning to fill the cognitive learning skill gaps in Malaysian children. This gap has been identified in the *Preliminary Report,* 2012[356]. The findings in both case studies show that children develop cognitive critical thinking skills when using technological devices. In the classroom, they talk and interact confidently with the teacher and classmates in classroom subjects and group discussions. This study contends that the Talk approach in the classroom is a social undertaking – a socio-cultural environment of learning that can be developed into activity learning. The activities in learning are the operational experiences, including the use of technological aids and discovery of new knowledge with Web technology. Talk stimulates children's critical thinking skills with teachers, peers and adults for many collaborative kinds of learning activities and for team working inside and outside the classroom. Through Dialogue or Talk in the classroom, children internalise their psychological functions of perception, understanding, attention and so on. The theories examined here give a strong groundwork for this study to propose a Dialogic Framework for learning new media and using interactive technology. With these findings, this study will synthesize the existing educational theories into a solid framework of a Dialogue or Talk teaching and learning approach in Malaysia.

[356] Ministry of Education, 2012. Preliminary Report, Malaysia Education Blueprint, Kuala Lumpur: Government Printers.

Chapter 4: The Contribution to Knowledge

Introduction

The previous chapter showed that the evidence of Talk or Dialogue both in children's social lives and in their classroom learning is linked to their cognitive learning development. This chapter, in turn, discusses Talk or Dialogue in the context of the existing educational theories that reveal children's psychological functions and cognitive development. This study also examines children's Talk or Dialogue with technological devices. Both case studies have shown that children benefit from the use of technological devices by exploring the tools, creating actions and becoming stimulated with the medium. This study goes on to build a framework for children's learning guidelines with the use of Talk or Dialogue, teacher's guidance of the ZPD concept and integrating the use of technological devices in the classroom. In the next chapter, this study formulates this framework of Talk or Dialogue for teaching and learning in the Malaysian classroom. The framework is a Dialogic Framework - a framework of Dialogue teaching and learning; an approach that will comprise four key existing educational theories of children's speech and learning development. This framework shows the benefits of children's metacognitive learning inside and outside the classroom with the Talk or Dialogue approach. This framework is intended to fill the gaps that have been identified by Malaysian scholars in Malaysian children's metacognitive development. In 2012, the Malaysia Education Department identified that Malaysian children lack cognitive thinking skills. The government published *The Malaysia Education Department Blueprint 2013-2025* (2012) to highlight new strategies that hope to fill these gaps[357].

In brief, this framework takes two approaches to Dialogue or Talk teaching and learning: to underpin Talk or Dialogue with the use of technological devices, and the ZPD concept. As part of this formula, it is required that teachers must ensure children are emotionally supported, educated in ways of conversing, submitting to the consensus, discussing possible outcomes together and voicing differing opinions in the classroom. Thus, teachers are encouraged and

[357] Ministry of Education, 2012. Preliminary Report, Malaysia Education Blueprint, Kuala Lumpur: Government Printers.

motivated and the students have a voice. These approaches also allow children to undertake actions and produce reactions with Dialogue that stimulates their psychological functions of perception, attention, sensory motor-operation and memory for learning accomplishment. Teaching and learning are articulated, through the teacher's help and engagement with learning activities such as delivering lessons, discussion, activity games, operating technological devices and tools for solving learning problems and thereby produce learning outcomes.

Sec 1 - The links between the existing educational theories to the Dialogic Framework.

The links between the existing educational theories to the Dialogic Framework.

My contribution to knowledge primarily rests on the construction of the Dialogic Framework that brings together key aspects of the educational theories of Dialogue and intellectual learning development in children. The Dialogic Framework has four characteristics that unite together significant existing educational theories on children's development relating to speech or Dialogue. Namely: the dynamic system of human functions as set out by Vygotsky[358]; the theory of child logic by Piaget[359]; the theory of enculturation by Rogoff and Wertsch[360]; and the theory of distributed cognition by Salomon[361]. The detail of the Dialogic Framework is discussed in Sec II – The Dialogic Framework and the its application. In this section, I explain the links between the existing educational theories and this framework.

I. The dynamic system of human functions

Vygotsky (1931) categorised perception, attention, sensory motor-operations, attention, memory and the use of tools and speech as the dynamic system of human psychological functions which helps children's intellectual development [362]. His theory describes these functions of children's intellectual development in relation to sign-operation activity. The sign-operation activity is the children's action with the use of social tools. This implies the use of speech, talk, or action with their social tools. Vygotsky claims that with speech, children internalise the learning activities with the use of tools. This study relates Vygotsky's statement that children's Talk or Dialogue with the use of technological tools is stimulated through their psychological functions of perception, attention, sensory motor-operations and memory.

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[358] Cole, M. John-Steiner, V. Scribner, S. and Souberman, E., 1978. *L. S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes,* Cambridge MA: Harvard University Press:
[359] Piaget, J., 1959. *The Language and Thought of the Child,* 3rd Edition, London: Routledge and Kegan Paul Ltd.
[360] Rogoff, B., 1990. *Apprenticeship in Thinking: Cognitive Development in Social Context,* Oxford: Oxford University Press. Wertsch, J. V., 1985. *Vygotsky and the Social Formation of Mind*, Cambridge, MA: Harvard University Press.
[361] Salomon, G., 1997. *Distributed Cognitions: Psychological and Educational Considerations*, Cambridge University Press.
[362] Vygotsky, L.S., 1960. *The History of the Development of Higher Psychological Functions.* In Development of Higher Psychological Functions. Moscow: Academy of Pedagogical Sciences, RSFSR. Cole, M. John-Steiner, V. Scribner, S. and Souberman, E., 1978. *Editors' Preface, L. S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes,* Cambridge MA: Harvard University Press.

Vygotsky argues that the sign-operations activity requires an intermediary link between the stimulus (the child) and the response (the social tools). Then, it creates a new relationship which fulfils a specific function of the individual who must be actively engaged in establishing that link i.e. speech (Cole, et al., 1978)[363]. This explains the use of Talk with the technological devices and tools to stimulate learning in this study. The Dialogic Framework put in place the said arguments of the two approaches of the Exploratory Dialogue and the Physical Functions Dialogue.

In describing each function in turn, I will briefly explain its form and relationship to children's psychological processes of learning in order to relate it to the current usage of Dialogue and its contribution to the use of Interactive technological devices and tools in children's intellectual development in the present day.

Perception and sensory motor-operations

Vygotsky, (1930) argued that perception is part of a dynamic system of behaviour. Vygotsky's experiments showed that language and perception are linked at a very early stage of development[364]. The child perceives the world not only through their eyes but also through their speech. As Vygotsky puts it: "The immediacy of normal perception is supplanted by a complex mediated process; as such, speech becomes an essential part of the child's cognitive development"[365]. Vygotsky's statements implicate the Dialogic Framework's approaches of teaching and learning. This framework stresses children's psychological functions of perception with the use of Talk or Dialogue through technological devices for learning activities. The approaches emphasises that Talk or Dialogue is important to children, without the use of Talk or Dialogue, children are unable to reason. Talk or Dialogue is part of children's reasoning development in carrying out daily tasks and gaining knowledge. Precisely in Vygotsky's argument, children internalise the use of social tools with speech. The framework underpins children's use speech through the technological devices. They talk, observe and explore the

[363] Cole, M. John-Steiner, V. Scribner, S. and Souberman, E., 1978. *L. S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press.
[364] Ibid. pp. 33.
[365] Ibid. pp. 32-33.

technological devices spontaneously to solve learning problems. During these processes, children talk and discuss learning activities. This study has found the evidence that Talk is associated with perceptual activities. A research findings made by Price and Rogers (2004) shows that the experiences children gained from the *'Let's Get Physical'* activity learning offered great diversity and perceptual information which reflected in different environments and discoveries. The activities provide the opportunity for children to physically collect the data by themselves and re-represent the outcomes digitally. This evidence is discussed in turn.

Attention and memory

Vygotsky claims that attention is as important as perception to the human's psychological functions, underlying the use of tools. Vygotsky mentioned Koffka's, (1924) claims that when a child perceives something, he or she is able to establish the importance of his/her perceptual field. Koffka wrote: "The child is able to determine the 'centre of gravity' of the perceptual field. Thus, the behaviour is not regulated solely by the individual element within it. The child evaluates the importance of these elements, singling out new figures from the background and widening the possibilities for controlling his or her activities"[366]. Having that said, the Framework allows children to establish their observational field of activity undertakings with the use of technological tools. When they are exploring learning activity, their attention is focused over the connected tools and elements in the activity. With this attention in mind, children foresee the next action of the learning accomplishment. For example, the activity learning games proposed in the Dialogic Framework require children's critical thinking in planning and executing the tasks with group member and teacher, searching for information and producing results with the technological devices. The evidence for this type of learning has been shown by Price and Rogers in their learning activity games *'Let's Get Physical'* on children's awareness. They argued that children are aware of what they do at many different

[366] Koffka, K., 1924. *The Growth of the Mind*, Routledge & Kegan Paul, London. Cited in Cole, M. John-Steiner, V. Scribner, S. and Souberman, E., 1978. *L. S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press.

observational levels. They argue that children put special attention and focus on the activity[367]. As a result, the Dialogic Framework applies to this type of activity, learning with Talk. The activity learning allows for multiple perceptual levels which enable children to access more information through different senses. The activity learning games provide a richer reflection about the world. Children are focussed on the contextually relevant information and activities. Accordingly, the activity learning provides more attention in highlighting any aspects of the physical world in certain locations.

Play

In Vygotsky's theory of play, the use of social tools and social interaction are crucial to a child's cultural development. In play, for example, Vygotsky argues that children treat imagination and play as their process of development. Vygotsky identifies that the psychological functions and social interaction, the use of social tools, the speech, and play are linked in children's learning development. During these processes, children internalise their higher psychological functions for the 'stimulus –response relation' with the artificial stimuli. The 'stimulus–response relations' explain the use of social tools arouse learning activities. The Dialogic Framework emphasises the Talk or Dialogue as the main medium in mediating the use of technological devices, the teacher's guidance and the internalization of their psychological functions. The mediation is conversation, discussion and dialogue between the teacher and the children with technological devices and tools for learning achievement. Therefore, these processes are the 'stimulus –response relation' with the technological tools. The technological tools arouse intellectual learning attainment. Vygotsky asserts that children unconsciously treat imagination and play as their process of development and play is an advanced development for a child. Children imagine themselves as being part of the adult's activities or project themselves onto someone else, rehearsing their future roles and values through play[368]. The Dialogic Framework, underpins learning activity games, in which children play and learn collaboratively

[367] Price, S. and Rogers, Y., 2004. Lets Get Physical: The Learning Benefits of Interacting in Digitally Augmented Physical Spaces. *Computers & Education* 43, 2004: pp. 137–151.
[368] Ibid. pp. 101-103.

with the teacher's help. Hence, they obtain the inspirations, abilities and attitudes required for learning. Moreover, the activity games allow children's behaviour to develop for their learning achievement. Children play with the objects and spaces which exposes their intellectual thinking for results with the technological devices.

II. The theory of the Distributed Cognition

As Vygotsky argues, learning in a specific cultural purpose requires the involvement and support of others. The interaction is critical in the process of learning with teachers, more capable peers or parents. The Dialogic Framework emphasises the Talk or Dialogue modus operandi with the ZPD concept. The interaction between teacher and children in learning activity and games allows for the expansion of knowledge acquisitions with technological devices and Internet tools. Children experience learning engagement through Talk or Dialogue with teachers, group members, flora and fauna, computers, iPads, tablets, Blogs, IWB and Internet learning tools. Perkins and Salomon, (1992) have expressed the notions of 'shared knowledge' in "Distributed Cognition". The terms argue that cognition is not to be found within the head only but distributed to other people and tools, when interacting with technologies, such as computers, television, radio, handheld gadgets and games[369]. The Dialogic Framework approaches allow children's connectivity with different ideas, various species of nature and learning concepts. Children are offered to deal with the shifting nature of information outside classrooms. Inside classrooms, the Framework outlines connectivity with peers and teachers. This way, children learn and prepare for learning with the use of technological tools. Gavriel Salomon, (1997) following Vygotsky argues that an essential feature of learning is that it creates the ZPD. That is, learning arouses various internal developmental processes through interaction and co-operation with many people in his environment and peers (Salomon, 1997)[370]. Interestingly, the above argument highlights Vygotsky's statement that the development of children's cognitive thinking is a process of

[369] Perkins, D. N. and Salomon, G., 1992. *Transfer of Learning; the International Encyclodaedia of Education*, 2nd Edition, Oxford, England: Pergamon Press.
[370] Salomon, G., 1997. *Distributed Cognitions: Psychological and Educational Considerations*, Cambridge University Press.

observing the changes. The Dialogic Framework stresses children's anticipation and contemplation during the process of using the technological devices with activity games about flora and fauna. The exploration allows children to discover unexpected effects, i.e. the sound being played of habitats such as birds, river flows, walking past plants, e.g. a thistle. These effects are new and incite children in understanding the actions or effects of things that they have never experienced. Rogers asserts that individuals participating together in an activity possess diverse kinds of knowledge (Rogers, 2006)[371]. The approaches highlighted in this Framework promote these experiences and engagement allows children to examine various encounters with technological devices and natures. The collaboration of activity and knowledge enables children to share experiences and accomplish learning. Hence, the process of distribution of cognition in memory, decision making, inference, reasoning, learning, and so on take place. These cognitive processes characterise dissemination and transformation of coordinated actions and information for sharing.

III. The dialogue socialization as "Enculturation" theory

J. Lave and E. Wenger, (1991) claim 'situated cognition' to be "Enculturation",[372] that is that thinking is embedded in the context of the task or activity at hand which then draws on social, cultural, and material resources for intellectual development. Simply put, cognitive processes do not reside solely in one's mind but involve relations between a person and a situation[373]. Consequently, the "Enculturation" is embedded in the context that draws upon social networking and cultural relationships with peers or classmates that sustained the Dialogic Framework approaches. These two contexts are the learning tasks and activity games at hand for Malaysian children. The approaches provide learning and knowing the context of activity simultaneously. The approaches describe the cognitive contextualization of learning processes as scholars have argued. Lave and Wenger maintain that situated cognition interprets thinking

[371] Rogers, Y., 2006. Distributed Cognition and Communication, wrote in *The Encyclodaedia of Language and Linguistics*, 2nd edition.
[372] Lave, J. and Wenger, E., 1991. *Situated learning: Legitimate peripheral participation*. New York: Cambridge University Press.
[373] Lave, J. and Wenger, E., 1991. *Situated learning: Legitimate peripheral participation*. New York: Cambridge University Press.

as never exactly the same for any two individuals or in any two contexts, and provide linkages to this framework. The Dialogic Framework anticipates activities between children embedded in the context of group discussion, executing tasks and producing results. These activities draw upon children's relationship with group members and teachers, in which they exchange ideas and experience learning with the use of technological resources. Therefore, children develop intellectual thinking in the context of activity tasks and games.

IV. The child logic theory

Piaget (1959) argues that logic and language are interdependent and a child's speech is communicating his thoughts[374]. Piaget claims that children feel confidence and freedom to voice out their own speech whether or not anyone is listening. Hence, the Dialogic Framework values Piaget's theory of children's speech for children's Talk or Dialogue inside and outside the classroom, during the action games and operating the technological devices and tools i.e. Blogs, Wikis, etc. These activities are built-into this framework for action; finishing homework, searching for information and playing games. In other words, children use their perception, attention, imagination and thinking skills for learning and excitement. Respectively, these arguments relate to Piaget's claims that children excite themselves to action when words are formed. The framework encourages children's use of talk, chat or text with technology tools, indicating Piaget argument that there are signs of a certain imaginative exuberance over cognitive thinking.

Conclusion

The key ideas here are the ZPD concept, the use of technological tools, the children's psychological functions of perception, attention, sensory motor operations and memory and the Dialogic Framework I have developed. The Dialogic Framework brings together in a new way ideas from diverse sources, i.e. the theory of children's speech, the ZPD concept in nurturing children's learning achievement, the socialised speech that happens within context and content.

[374] Piaget, J., 1959. *The Language and Thought of the Child*, 3rd Edition, London: Routledge & Kegan Paul Ltd.

The distributed cognition of shared knowledge in children's learning acquisition means that children encounter and learn through the varied processes of life. More precisely, consider how interactive technological devices, standing in place of an adult in the ZPD concept shape and form the child's 'social learning' world. The Dialogic Framework is of itself a contribution to knowledge and application in future research will bring about new understandings. Used effectively the Dialogic Framework will provide a means of considering the complex play of factors that contribute to the whole child's learning development. Previously, the theories that make up the Dialogic Framework (the four characteristics) have been separate and taken in isolation. The child's egocentric speech explained by Piaget has been examined critically, to a higher level of children's speech in learning development with the use of technological devices and the Internet tools. The Enculturation theory of children's socialised speech by Lave and Wenger has opened up a new way in understanding learning as situated cognition. The Distributed cognition theory of shared knowledge has taught us that knowledge is distributed over our lives and surroundings. The human psychological functions of perception, attention, sensory motor operations and memory are important to children's learning attainment. These ideas are now in one framework – that is the framework of children's intellectual development.

Sec II - The Dialogic Framework and the application

The Dialogic Framework and the application

Introduction

My contribution to knowledge primarily rests on the construction of the Dialogic Framework. This framework brings together four key aspects of the existing educational theories of children's speech and cognitive learning development. The framework is for Malaysian children and teachers to uphold the significance of Dialogue inside or outside classroom learning. The framework emphasises two approaches to teaching and learning with the use of technological devices to facilitate learning. The two approaches are named the Exploratory Dialogue and the Physical Functions Dialogue. These approaches highlight the use of Dialogue to children's psychological functions of perception, attention, sensory motor-operation and memory. The four existing theories mentioned are the pillars that help create this framework with the Interactive technological devices and the ZPD concepts to this approach. The theories are: The dynamic system of human functions – the higher psychological functions as set out by Vygotsky[375]; the child logic theory of Piaget[376]; the theory of social speech as enculturation by Rogoff and Wertsch[377]; and the theory of distributed cognition by Salomon[378].

The background of the Malaysian Education System

In 2012, the Malaysia Education Department identified that Malaysian children lack cognitive thinking skills. A report – *Preliminary Interim Plan 2011-2020* (2012) has been issued to focus on the educational strategies that highlight children's cognitive learning[379]. The *Interim Plan* underlined eight standard components of learning for students. These are the use of the Malay language and the strengthening of students' use of the English language;

[375] Cole, M. John-Steiner, V. Scribner, S. and Souberman, E., 1978. *L. S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes,* Cambridge MA: Harvard University Press.
[376] Piaget, J., 1959. *The Language and Thought of the Child,* 3rd Edition, London: Routledge and Kegan Paul Ltd.
[377] Rogoff, B., 1990. *Apprenticeship in Thinking: Cognitive Development in Social Context,* Oxford: Oxford University Press. Wertsch, J. V., 1985. *Vygotsky and the Social Formation of Mind.* Cambridge, MA: Harvard University Press.
[378] Salomon, G., 1997. *Distributed Cognitions: Psychological and Educational Considerations*, Cambridge University Press.
[379] Ministry of Education, 2012. Preliminary Report, Malaysia Education Blueprint, Kuala Lumpur: Government Printers.

innovation and creativity; support for vocational education; early education for children; inclusive education; sports activity for students; cyber learning and lastly partnership of public, private, community and parents. Likewise, there are six standard components to support teachers, schools and the government. These include the teachers' profession; reinforcement of faith appreciation and good value; strengthening the schooling structure; stabilizing infrastructure of the Ministry of Education Malaysia (KPM); transforming curriculum and co-curriculum and lastly transforming assessment methodology[380].

In 2012, the Ministry of Education Malaysia endorsed the *Malaysia Education Blueprint 2013-2025* which focuses on the strategies that highlight the need for a significant improvement in children's cognitive learning development[381]. The *Blueprint* emphasises the importance of a richer range of educational issues in Malaysia. The report stresses the significance of the aspirations of students and their educational development with the knowledge of thinking skills, leadership skills, bilingual proficiency, ethics and an awareness of spiritual and national identity. The most important matter is the students' educational outcomes[382]. Hence, the Dialogic Framework is, I argue, important to help the new Malaysian generation uphold the principles of responsibility, integrity and the desire for individuals to be educated. For example, Zakaria, E and Iksan, Z. (2007) in the *Journal of Mathematics, Science and Technology Education* assert that there are two pedagogical limitations in Malaysian schools[383]. Lecture-based instruction and teacher-centred instruction have been identified as passive acquisition of knowledge; students become passive recipients of knowledge and resort to rote learning. They claim that the teacher-talk technique - using lectures, directed demonstrations and simple Q & A, which dominates 80% of the talk in most classrooms – generally leads to students seldom asking questions or exchanging thoughts with other students in the class[384].

[380] Malaysia Education Department, 2012. Pelan Strategik Interim KPM 2011-2020, Kuala Lumpur: Government Printers.
[381] Ministry of Education, 2012. Preliminary Report, Malaysia Education Blueprint, Kuala Lumpur: Government Printers.
[382] Ibid. pp. 5.
[383] Zakaria, E. and Iksan, Z., 2007. Promoting Cooperative Learning in Science and Mathematics Education: A Malaysian Perspective, *Eurasia Journal of Mathematics, Science & Technology Education,* 3 (1): pp. 35-39.
[384] Ibid. pp. 35-39.

The Theoretical background of the Dialogic Framework

The Dialogic Framework is a framework that emphasises children and teachers' involvement and participation in the classroom with the use of Talk or Dialogue as a teaching and learning approach. This approach integrates the use of the interactive technological devices with the ZPD concept. The ZPD concept reinforces teacher's and children's open commitment to learn, share and solve problems together. The ZPD concept was proposed by Vygotsky in 1930s, claiming that the construction of knowledge and understanding is a natural process of social activity between children and parents or teachers. Children gain knowledge better through speech, face to face context, play or learning together through mistakes, or not, with a capable peer, parent or teacher. These processes are claimed to be a more valuable process than direct interpretations of the physical world. Children are mediated by the society where they live. With social interactions, children encounter many wonderful things with many people (Cole, et al, 1978)[385].

Mercer and Littleton, (2007) argue that the ZPD is an integral part of an interactive theory of cognitive development, a process of joint activity for children and parents at home or teachers in the classrooms[386]. In 2004, Mercer applied Thinking Together – A Dialogue approach program that built on the Vygotskian notion of language as the prime cultural and psychological tool for learning[387]. The scholars argue that Talk is a tool for creating a new shared understanding. Talk or Dialogue would not be finished in just the classroom, learners take up topics they discussed on earlier occasions and transfer the experience they have. Thus, they learn about their discussions in terms of future activities and outcomes (Mercer, 1995, 2000; Littleton, 1999; Rojas-Drummond, 2000; Mercer & Littleton, 2007)[388]. Consequently,

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[385] Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., 1978. *Vygotsky, L.S. Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press.
[386] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children's Thinking, a Sociocultural Approach*, pp. 13-15, London and New York: Taylor & Francis Group, Routledge.
[387] Adapted from Dawes and Sams, 2004a., pp. 105. Dawes, L. and Sams, C., 2004a. *'Developing the Capacity to Collaborate',* in K. Littleton, D. Miell and D. Faulkner (eds.*) Learning to Collaborate, Collaborating to Learn*, New York: Nova.
[388] Mercer, N., 1995. *The Guided Construction of Knowledge: Talk Amongst Teachers and Learners,* Clevedon: Multilinguil Matters. Littleton, K., 1999, "Productivity through interaction: an overview", in K. Littleton and P. Light (eds.) Learning with Computers: Analysing Productive Interaction, London: Routlegde. Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children Thinking; A Sociocultural Approach*, pp. 39, Abingdon, Oxon: Routledge.

Daniels (2001) in his book *Vygotsky and Pedagogy*, argues that the interactional teaching-learning process causes the process of 'scaffolding' for child guidance[389]. Vygotsky argues that children's learning development is the process of Talk and social interaction from more knowledgeable adults to the less knowledgeable in the ZPD concept[390]. R.G. Tharp and R. Gallimore (1988) adopted Vygotsky's notion in the ZPD claim that learning occurs through peer assistance[391]. Many scholars reproduce Vygotsky's idea of children's speech development for children's cognitive learning. This evidence is valuable to be highlighted in this framework for Malaysian learning.

The Dialogic Framework

The Dialogic Framework is a Dialogue teaching and learning modus operandi for Malaysian children and teachers. This framework creates a new shared understanding of teaching and learning. The detail of the Dialogic Framework is illustrated below:

[389] Daniel, H., 2001. *Vygotsky and Pedagogy*, London: Routledge/Falmer.
[390] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children's Thinking, A Sociocultural Approach*, Routledge: London.
[391] Tharp, R.G. and Gallimore, R., 1988. *Rousing Minds to Life: Teaching, Learning and Schooling in Social Context*, Cambridge: Cambridge University Press.

Figure 3.

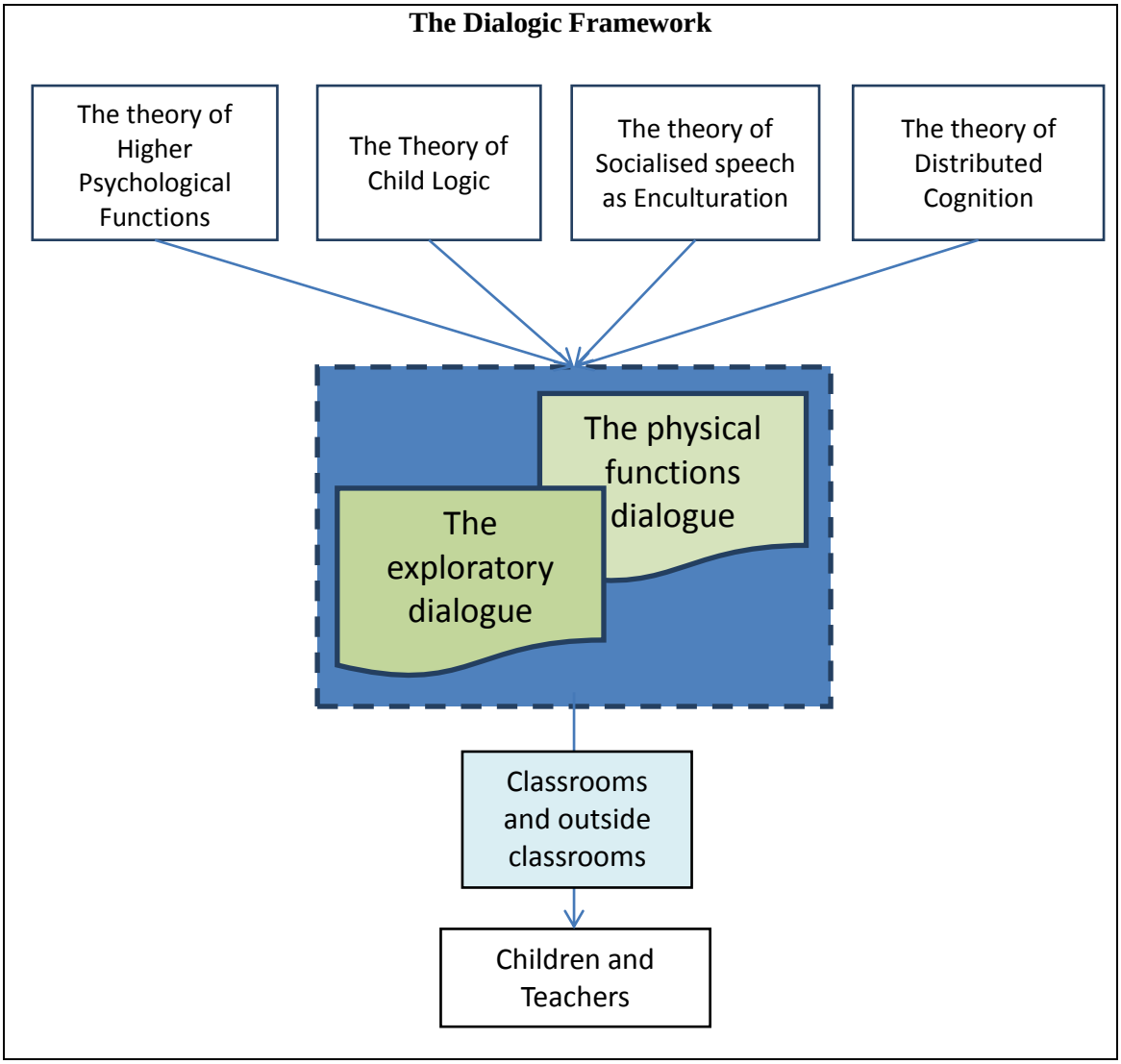

Figure 3:

Figure 3 shows a structure for the Dialogic Framework for this study. The Framework shows the four existing educational theories that are synthesised together into an approach of Dialogue in teaching and learning.

1. The first four white squares represent the existing educational theories about children's Talk and learning that are synthesised into a Dialogic Framework.
2. The blue square with the dotted line represents the two approaches of dialogic teaching and learning that this study has concluded. They are: the exploratory dialogue and the physical functions dialogue. The dotted line shows that these two approaches are open for improvement according to the school, teacher and classroom setting.
3. The third light blue square represents the approaches to be taught inside and outside the classroom.
4. The last white square shows children and teachers, who are the people that benefit from the approaches.

The Dialogic Framework approaches formulate children and teacher's engagement in the schools through four important learning aspects. Namely: the use of Talk or Dialogue between teacher and children, the use of technological devices and tools, the ZPD concept and the children's psychological functions. The children's psychological functions are the internalization processes of their perception, attention, sensory motor-operations and memory. The internalization means the values of learning or socialization that children process within their self-conscious or subconscious of these functions.

The Exploratory Dialogue and Physical Functions Dialogue highlight classroom Talk or Dialogue for discussion, critical thinking skills, collaboration work and solving the learning problem. The Talk or Dialogue teaching and learning denote the use of the exploratory kind of dialogue-based words such as: why do you think so?, where do you think it should?, how about?, I think, because etc. which must be set in the classrooms with the teacher. Both approaches emphasise collaborative thinking and the ZPD concept that underpins teachers' participation; teachers are to provide guidance and support that motivate children[392]. This kind of teaching and learning approach has been made available in most of the English schools. Mercer and Littleton claim that the Dialogue learning approach directs teaching of speaking and listening skills that children and young people need, so that they learn from and with each other (Mercer & Littleton, 2007)[393]. Mercer and Littleton wrote: *"Helping learners to collaborate in order that all might benefit is not just a matter of ensuring that everyone is placidly amenable or that disagreement is quickly stifled or avoided"*.

The Dialogic Framework adopts Dialogue teaching and learning approaches by existing scholars. However, this framework emphasises the internalization process of children's psychological functions to children's learning. Children's perception, attention, sensory motor-operations and memory are the significant features that contribute to children's intellectual development. Vygotsky claims that children's speech internalises their development of

[392] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children's Thinking, A Sociocultural Approach*, London: Routledge.
[393] Ibid. pp. 69-70.

psychological functions; perception, attention, sensory motor-operation and memory to their intellectual development[394]. The use of Talk, the technological tools with the ZPD concept stimulate children's perception, attention, sensory motor-operation and memory in learning. Thus, the stimulation develops touch, feel, movement and engagement with the use of technological devices can contribute to children's intellectual development. In this respect, the Dialogic Framework underpins teachers as the role models for children's educational success. The Dialogic Framework stresses close interaction between teacher and children so that they learn, imitate and produce good learning achievement.

In mentioning this, a research that has been done by the Faculty of Education, University Kebangsaan Malaysia has found the gaps in children's learning fulfilment. The research identifies that Malaysian children lack emotional support and they have no voice. These gaps are claimed as the most crucial metacognitive development activities that need to be emphasised in the Malaysian classrooms (Rahman, et al. 2011)[395]. Saemah Rahman, Mazli Sham Abdullah, Ruhizan M, Yasin, T. Subahan Mohd Meerah, Lilia Halim and Ruslin Amir (2011) wrote for *Student Learning Style and Preferences for the Promotion of Metacognitive Development Activities in Science Class.* Rahman, et al. stress the needs for teachers to provide encouragement, reaction and reflection on children's ideas by writing their own comments to children. They claim that children in Malaysia lack teacher's encouragement and motivation[396].

In this respect, the Dialogic Framework proposes a Dialogue teaching and learning approach that puts emphasis on the promotion of metacognitive development inside and outside the classroom for children. This approach underpins the interaction of children and teachers with Talk or Dialogue that integrate the interactive technology devices and the Internet tools. The interactive technological devices are such as the general computer at schools, the interactive whiteboards, the mobile hand phone, the mini notebook and the portable tablet. The Internet

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[394] Vygotsky, L.S., 1931. *"The History of the Development of Higher Psychological Functions."* In development of Higher Psychological Functions. 1960. pp. 13-223, Moscow: Academy of Pedagogical Sciences, RSFSR. Cited in Cole, M., John-Steiner, V., Scribner, S. and Souberman E., (Eds.) 1978. *Vygotsky, L. S. Mind in Society: The Development of Higher Psychological Processes.* Cambridge, MA: Harvard University Press.

[395] Rahman, S., Abdullah, M. S., M. Yasin, R., Mohd Meerah, T. S, Halim, L. and Amir, R., 2011. *Student Learning Style and Preferences for the Promotion of Metacognitive Development Activities in Science Class. World Applied Science Journal 14, Special Issue of Innovation and Pedagogy for Diverse learners:* pp. 11-16.

[396] Ibid. pp. 11-16.

tools are such as: Blogs, Wikis and RSS Feeds. The use of these technologies coupled with Talk or Dialogue will help children develop metacognitive reflection in learning. Siegfried M. Holzer's (1998) article entitled: *From constructivism to active learning* cites Piaget's claim that the interaction between people, subject and object continuously develop the construction of knowledge exchanges[397]. Piaget maintains that children's speech and social interaction are children's source of metacognitive development[398].

With that basis, the Framework reinforces children and teacher's Talk or Dialogue through the exploration of the technological devices for knowledge acquisition. The exploration of the technological devices means the engagement and operation over classroom tasks and activities. The learning is coordinated with spaces through a variety of object and tools that will generate body stimulation around the learning areas. This activity allows teachers and children to have the chance of developing the physical interaction within the space available in the schools or outside schools. Hence, the learning will be developed into numerous digital representations appropriately to points and types that children and teachers have set. This kind of learning excites children to step forward in the learning activity. This way, children are encouraged to think, reflect and solve learning problems[399] (Price and Rogers, 2004). Moreover, with the teacher's help, children are encouraged to drive their own learning and understanding, through the talk, discussion and physical–digital links. In this respect, this framework underpins a healthy engagement and participation between children and teachers that brings enjoyment in learning indoors and outdoors. The healthy engagement means the teachers' response and open commitment toward solving children's learning problem. This type of engagement is still lacking in Malaysian classrooms. Rahman, et al. argue that past studies have shown that children must have motivational factors in learning[400]. Children need to understand the science

[397] Holzer, S., 1998. *From constructivism to active learning.*
[398] Piaget, J., 1959. *The Language & Thought of The Child.* 3rd edition. London: Routledge & Kegan Paul LTD.
[399] Price, S. and Rogers, Y., 2004. Let's Get Physical: The Learning Benefits of Interacting in Digitally Augmented Physical Spaces. *Computers & Education* 43: pp. 137–151.
[400] Rahman, S., Abdullah, M. S., M. Yasin, R., Mohd Meerah, T. S, Halim, L. and Amir, R., 2011. *Student Learning Style and Preferences for the Promotion of Metacognitive Development Activities in Science Class. World Applied Science Journal 14, Special Issue of Innovation and Pedagogy for Diverse learners:* pp. 11-16.

concepts of learning science subject. They must have the ability to undergo conceptual change and problem solving skills. The conceptual change is important to be rectified in this study.

The Dialogic Framework approaches stress on the conceptual change of children's development through social interaction, the use of social tools such as the technological devices and Internet tools. Vygotsky asserts that cultural background and social interaction is an inherent part of knowledge construction. The understanding and knowledge of a person is grounded in their experience of the world through social interaction and mediation of that grounding (Vygotsky, 1978)[401]. With Piaget and Vygotsky's arguments on children's knowledge construction, the Dialogic Framework is for teachers and children's knowledge construction, characteristic building and intellectual development that came from the ZPD, the use of technologies and children's psychological functions. These benefits of learning, I contend, are needed by Malaysian children for future development in their studies, career and life skills.

The details of the two approaches in the Dialogic Framework

The Exploratory Dialogue

The Exploratory Dialogue approach puts emphasis on Talk or Dialogue. A protocol for speaking and listening is essential between teachers and children with the ZPD concept. The approach fosters learning discussions; and widens children's critical thinking through the use of language for content creation. These qualities are the internalization of human psychological functions that contribute to their intellectual learning. Mercer claims that the Dialogue approach takes a shared, active and reflective role in building children's understanding[402]. In any collaborative group work, the discussion should be comprehensive and respectful of opinions and ideas among the group members and the teacher (Mercer & Littleton, 2007)[403].

[401] Cole, M., John-Steiner, V., Scribner, S. and Souberman E., (Eds.) 1978. *Vygotsky, L. S. Mind in society: The Development of Higher Psychological Processes.* Cambridge, MA: Harvard University Press.
[402] Mercer, N. And Littleton, K., 2007. *Dialogue and the Development of Children's Thinking, A Sociocultural Approach*, London and New York: Routledge.
[403] Ibid. pp. 70.

The theoretical background

The approach adopts the Thinking Together program and many other Dialogue methods such as: the Exploratory Talk by Barnes and Todd, (1996) and the Conversational Framework by Laurillard (2008). The Conversational Framework values conversation in teaching and learning with the use of technological media[404] (Laurillard, 2008).

The Exploratory Dialogue approach aims to help Malaysian children to be able to Talk or Dialogue with peers, adults, teachers, parents and society confidently and intellectually. The goal is to see future Malaysian children who are critical and intelligent in thinking and solving problem skills. In achieving the goals, this approach reinforces shared learning through the Internet search engines for Web resources. The Web resources are Wikipedia, Google search engines on e-learning, online libraries, educational video clips or Blogs, Wikis or RSS feeds with teachers. Laurillard asserts that these technological tools provide accessibility and user control. These are the most important features in terms of pedagogy[405] (Laurillard, 2008). She claims that her Conversational Framework leverages learners to have the ability to openly access any part of the material in any sequence. The material is as user-responsive as it is interactive. Users can navigate and select the content at will in the form of text, graphics, audio, video or any combination (Laurillard, 2008, p.107)[406].

In learning acquisition, children and teachers are to explore as much as possible the knowledge materials from Internet search engines. William Holmes, (1999) wrote *The Transforming Power of Information Technology,* he maintains that technologies allow teachers to maximise teaching opportunity. Teachers can enhance the effectiveness of teaching by searching syllabus references, classroom lessons and information. Teachers can extend their argument from local to global networking and exposure i.e. The web-based teaching, video-conferencing, cross-cultural sharing, many types of interactive and multimedia materials[407].

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[404] Laurillard, D., 2008. *Rethinking University Teaching – A Framework for the Effective Use of Learning Technologies,* 2nd Edition, London: Routledge/Falmer.
[405] Laurillard, D., 2008. *Rethinking University Teaching – A Framework for the Effective Use of Learning Technologies,* 2nd Edition, London: Routledge/Falmer.
[406] Ibid. pp. 107.
[407] Holmes, W., 1999. The Transforming Power of Information Technology. *Community College Journal,* 70 (2): pp. 10-15.

Malaysian Current Learning Context

In the Malaysian context of classroom learning, Termit Kaur Ranjit Singh and Sani Alhaji Garba (2011) argue that Malaysian teachers are ready to incorporate teaching with technology devices[408]. They wrote for *Teaching in the Information Age: How Prepared Are Teachers in Malaysia?* - A proceeding for the Deans in the Educational Institutions. Their findings show that Malaysian teachers are positive and prepared to use the Interactive White Boards (IWB) in classroom teaching. So far, other technologies such as the use of mobile phones through Short Message Services (SMS) are proposed to be applied in 2016 in Malaysian schools[409]. Efforts to bring the technologies into learning are increasing by the scholars[410]. Teaching and learning have started to include the use of computer-related media such as images, video, sound clips and internet content via the Internet Web Technology. Singh and Garba argue that the IWBs' unique application features help the teacher or user to control their presentations from the screen with the touch screen feature. The user or teacher can use video and data conferencing by combining the video and application images. Images can be captured to a power point presentation. Teachers or children can use the board for brainstorming ideas and discussing diagrams. If needed, the work can be saved and printed. The teacher can write on the smart board screen or use fingers to control by pointing, clicking and dragging. There is a feature to convert handwritten text into typewritten text[411].

With Singh and Garba's argument, the Exploratory Dialogue proposes the use of the Internet Technology Blogs and the IWBs for learning. The use of the Blogs is useful for children to practice their exploration skills with the interactive technological devices. The Blogs are identified as stimulating and useful for children's motor action and for critical, analogical and

[408] Ranjit Singh, T. K. and Garba, S. A., 2011. Teaching in the Information Age: How Prepared Are Teachers in Malaysia? *Proceeding Seminar for the Dean in the Educational Institutions.*
[409] Siraj, S. and Salleh, M.P., 2003. "Aplikasiteknologidalampengajarandanpembelajaranperingkatsekolahmenengah: jangkaanmasadepan (Technology application in teaching and learning at secondary school: a future projection)", *Journal of Educational Research.* 23: pp. 123-139.
[410] Unesco., 2010. (United Nations Educational, Scientific and Cultural Organization) *How Will ICT Change the Future of Education.*
[411] Ranjit Singh, T. K. and Garba, S. A., 2011. Teaching in the Information Age: How Prepared Are Teachers in Malaysia? *Proceeding Seminar for the Dean in the Educational Institutions.*

associational thinking[412] (Richardson, 2006). This evidence has been presented by Richardson in his article: *Blogs, wikis, podcasts, and other powerful web tools for classrooms* (2006). Richardson mentions Brock L. Eide and Fernette F. Eide (2006) ; the learning specialists. The latter claim that the Blogs, Wikis and other powerful web tools are beneficial for children's learning. These tools provide critical and analytical thinking, creative, intuitive, analogical thinking and associational thinking (creative and associational thinking in relation to blogs being used as a brainstorming tool and also as a resource for interlinking, as well as commenting on interlinked ideas)[413]. Blogs provide potential for increased access and exposure to quality information and the combination of solitary and social interaction[414].

The Dialogic Framework aims at preparing Malaysian children to excel in these skills mentioned. Evidence shows that these skills are lacking in Malaysian children. In 2009, the results from PISA 2009+ (Programme for International Student Assessment) were discouraging, Malaysia ranked in the bottom third of 74 participating countries, which is below the international and OECD average. The report claims that almost 60% of 15-year-olds failed to meet the minimum proficiency level in Mathematics, while 44% and 43% did not meet the minimum proficiency levels in Reading and Science respectively[415].

The discussion about the Internet Technology tools with this Framework

Duffy and Bruns (2006) claim that Blogs and Wikis facilitate talk which is stimulating to children's learning. Writing on the role of Blogs and Wikis, in the facilitation of talk as stimulation to learning, Duffy and Bruns (2006) argue that blogs, Wikis and RSS are being downloaded or subscribed to according to what students want[416].

In this respect, this Exploratory Dialogue highlights the use of Blogs and Wikis for children. These Internet technology tools are important to be proposed for children's development of

[412] Richardson, W., 2006. *Blogs, wikis, podcasts, and other powerful web tools for classrooms.* Thousand Oaks, CA: Corwin Press.
[413] Eide, Brock L. and Eide. Fernette F., 2006. The Mislabelled Child. *The New Atlantis, A Journal of Technology and Society.*
[414] Ibid. pp. 31-38.
[415] Ministry of Education, 2012. Preliminary Report, Malaysia Education Blueprint, Kuala Lumpur: Government Printers.
[416] Duffy, P. and Bruns, A., 2006. The Use of Blogs, Wikis and RSS in Education: A Conversation of Possibilities. *In Proceedings Online Learning and Teaching Conference*, pp. 31-38.

knowledge conceptions. The reformulation of ideas in the Talk or Dialogue approach leverages children's knowledge conceptions. By applying this approach in the classroom, children are taught the way of using Talk to discuss, learn, and collaborate in solving learning problems. Thus, children experience the use of educated discussion of learning and content creation. Therefore, children are clear to state a position or argument in Blogs and Wikis. The Blogs and Wikis provide the potential for deep learning reflection among the children.

However, this study urges caution over exposure to the Internet community. How can we design activities to support the current sense of excitement associated with participating in the Blogosphere? This framework has concerns about the social experiences and approaches that are emerging quickly in the Internet community of social networking. With the social and community based Blogosphere networking, children are exposed to the continuous expression and interaction with different ideas and views. For example, Steve Wheeler, Peter Yeomans and Dawn Wheeler (2008) wrote about "*The good, the bad and the wiki: Evaluating student-generated content for collaborative learning",* claiming that social loafing happens to the children, thus, resulting in the disproportionate content contribution amount[417].

Besides the Internet community, the concerns also transpired about children's time management. For example, Duffy and Bruns maintain that children spend more time on MSN Messenger rather than writing emails, using ICQ, i.e. Offline user messaging, multi-user chats with emoticons, free daily-limited SMS sending, resumable file transfers, greeting cards, multiplayer games and a searchable user directory. The current learners treat the Internet and other forms of electronic discourse as tools for social interaction not just for the concept of reading and writing[418].

In this respect, the Exploratory Dialogue approach apprehends the ZPD concept in children's learning by Vygotsky. Vygotsky claims that children's cognitive learning develops through the use of social tools and social interaction with teachers, parents or adults' guidance.

[417] Wheeler, S., Peter Yeomans, P. and Wheeler, D., 2008. "The Good, the Bad and the Wiki: Evaluating Student-Generated Content for Collaborative Learning" *British Journal of Educational Technology* Vol. 39 No 6, 2008*:* pp. 987 –995.
[418] Duffy, P. and Bruns, A., 2006. The Use of Blogs, Wikis and RSS in Education: A Conversation of Possibilities. *In Proceedings Online Learning and Teaching Conference*, pp. 31-38.

Vygotsky asserts that children need guidance; i.e. the adults, parents or teachers in supporting and motivating them. The use of Talk or Dialogue is the mediator of children's learning with ZPD. Hence, this framework emphasises teachers' guidance over the use of the Internet tools. For example, the use of Blogs or Wikis at home or at school is to be monitored by the teachers or parents. With the ZPD concept, children are being taught with the sense of ownership of this idea; the responsibility for their own actions, knowledge and understanding. These are children's higher psychological processes of intermental and intramental abilities with the use of social tools[419] (Vygotsky, 1932). The intermental is the social interaction with people and the community; the intramental is the processes of their psychological functions of perception, attention and so on. Vygotsky purports children are able to differentiate between the good and the bad by themselves. In play for example, Vygotsky argues that children are able to perform actions as adults that they admire. Or they imitate the roles that they look-upon. They act out the activities of their culture and rehearse any future roles and values that they respect. *"In play a child is always above his average age, above his daily behaviour, in play it is as though he were a head taller than himself".* Vygotsky explained[420]. The argument shows that children are learned by the actions and meanings that they have experienced throughout their social interactions, undertaking activities and plays. These processes have thought them to evaluate lessons and produce outcomes. Having said that, children are wise to make decisions and solve problems based on their own intellectual judgement.

Therefore, this approach values meaning and action in teacher's intervention with the technologies for lessons. For example, in the classroom, children look-upon their teacher for learning and development. The teacher's role as an exemplar means so much to children. Hence, the value of Talk or Dialogue with the technological devices and Internet tools allow children a more active exposure to the Internet technologies. Children not only learn but play with the technological tools. Vygotsky claims that in play, children's development is comparable to the instruction. Play provides a significant background for changes in needs and

[419] Cole, M., John-Steiner, V., Scribner, S. and Souberman E., (Eds.) 1978. *Vygotsky, L. S. Mind in Society: The Development of Higher Psychological Processes.* Cambridge, MA: Harvard University Press. pp. 52-57.
[420] Ibid. pp. 102.

consciousness. Children's action in play is in their imaginative sphere of the world where they create voluntary intentions. Vygotsky claims that play is the highest level of their preschool development that moves them forward meaningfully. Play is a leading activity that determines the child's development (Cole, et al., 1978)[421]. With these arguments, I contend, the framework is useful not only to children's learning development but more than that. That is the opportunity for Malaysian children to become educated individuals that understand learning from a holistic perspective. With the teacher's involvement and participation, the framework foresees a better learning methodology for learning, writing and reasoned thinking skills development. Duffy, et al. maintain that Blogging is a written reflection that changes teaching rhetorical sensitivity and learning reflection. Children today are highly active in internet-based environments. They interact, and comment on each other's written material. These activities are being done by children even without formally realizing the intellectual in doing so[422] (Duffy, et al., 2006). Duffy, et al.'s statement provides clarity that children explore the technological tools spontaneously. To an extent, they are not aware of the benefit of the learning attainments that they have gained from these tools. They are stimulated into the processes of activities built in with these tools which are their knowledge acquisition.

In analyzing the pedagogical application for learners, Wheeler, Yeomans and Wheeler (2008) mentioned Michael F. Beaudoin (2002). Beaudoin argues that previous studies have shown that students learn even though they do not directly contribute to a message board, a term called 'lurking'[423]. The teacher might adopt a *laissez-faire* attitude which means listening to the children's contribution. In explicating this argument to this framework, the word listen, describes attend to or pay attention. Simply put, teachers need to pay attention to children's voices. Teachers are to attend to children's needs. The engagement of the teachers with children in the classrooms is critical. This includes providing attention and listening to children's problem and helping them. That said, children's lurking with the technological devices and the

[421] Ibid. pp. 101-103.
[422] Duffy, P. and Bruns, A., 2006. The Use of Blogs, Wikis and RSS in Education: A Conversation of Possibilities. *In Proceedings Online Learning and Teaching Conference*, pp. 31-38.
[423] Beaudoin, M. F., 2002. Learning or Lurking? Tracking the Invisible Student. *Internet and Higher Education*, 5: pp. 147–155.

Internet tools are the models for exploration of the contents and meanings. Children are actually developing their own skills by participating in the knowledge-based platform of the digital culture. Children evaluate the knowledge sharing on the Net.

In understanding children's social and emotional aspects of learning with the Internet technologies, research by Neil Humphrey, Afroditi Kalambouka, Joanna Bolton, Ann Lendrum, Michael Wigelsworth, Clare Lennie and Peter Farrell (2008) has the evidence. They wrote *Evaluation of small group work*, (2008) for the Department of Education and Skills, England[424]. SEAL is written for schools in England to promote social and emotional skills in children. The skills are underpinned for effective learning, positive behaviour, regular attendance and emotional wellbeing (2005)[425]. SEAL is being used in more than 80% of primary schools across England (Hallam, Rhamie and Shaw, 2006)[426]. Humphrey, et al. claim that students have to develop many abilities such as: Enabling personal development, exploring key issues in more depth, practicing new skills in an environment that is safe. Students have to be able to take risks and learn about themselves, developing relationships with others, in reflecting the DfES 2006 report on urging for student's capability in knowing how to evaluate information critically, work independently and being creative (2006)[427].

In summary, those abilities mentioned in the SEAL report provide explanations to this study that Great Britain plans students' attainment in education and wellbeing systematically and detail. Therefore, this framework is timely for the Malaysian Education Department. This framework is designed for students' social and emotional aspects of learning; attainment in education and wellbeing. That is, toward nurturing future Malaysian children that are intellectual, and independent in solving their pedagogical needs for social and emotional learning support. Although SEAL is in Great Britain, this framework values the outlines provided in the report. The goal of SEAL is in-line with this framework. For example in SEAL,

[424] Humphrey, N., Kalambouka, A., Bolton, J., Lendrum, A. Wigelsworth, M., Lennie, C. and Farrell, P., 2008. *Primary Social and Emotional Aspects of Learning (SEAL): Evaluation of Small Group Work.*
[425] The Department for Education and Skills (DfES) became the Department for Children, Schools and Families (DCSF) in July 2007. References to DfES and DCSF are used synonymously throughout this report.
[426] Hallam, S., Rhamie, J. and Shaw, J.2006. Evaluation of the Primary Behaviour and Attendance Pilot, Institute of Education.
[427] The Department for Education and Skills (DfES) became the Department for Children, Schools and Families (DCSF) in July 2007. References to DfES and DCSF are used synonymously throughout this report.

these qualities are outlined for British students: enabling personal development, exploring key issues in more depth, and practicing new skills in an environment that is safe. Students have to be able to take risks and learn about themselves and develop relationships with others. This framework, I contend, put in place these qualities (in SEAL) in an approach of Talk or Dialogue learning methods, the use of technological tools, the ZPD concept and the children's psychological functions.

The ZPD concept maintains teachers' guidance and supports for children that is developed through their close supervision and support. With Dialogue and interaction, children internalise the relationships, cultural, social and behaviour. This framework put in place these relationships for children's social and emotional support with teachers.

On the ownership of the intellectual property for example, children may experience problems such as plagiarism and alteration of the original ideas by the group members that could be anonymous. The ZPD concept in the approach sets out close supervision and advice of the teacher over children's content creation. Therefore, training should be given to teachers and children on the use of the technological tools for protection. Mercer and Littleton cite Blatchford, et al. (2003), arguing that classroom learning is a social activity. They maintain that training should be given to promote the development of good relationships and interpersonal trust between children. Blatchford and colleagues have developed an educational intervention program that they characterise as using a relational approach to the development of group working (Blatchford and Kutnick, 2003)[428]. Hence, the schools' participation, encouragement and support of the use of the technological tools are to be highlighted. The ZPD concept fosters protection over all aspects of children's attainment that includes a secured learning environment physically and emotionally. Therefore, children are content with learning new tools, exploring Internet technologies and voicing opinions by creating online journals and are obliged to use the technologies.

[428] Blatchford, P., and Kutnick, P., 2003. 'Developing group work in everyday classrooms', Special Issue, *International Journal of Educational Research,* 39 (1-2): pp. 1-172. Blatchford, P., Kutnick, P., Baines, E. and Galton, M., 2003. 'Towards a Social Pedagogy of Classroom Groupwork', *International Journal of Educational Research* 39: pp. 153-172.

Such socially based technologies sit well with the understanding of learning as socially constructed, which has been a cornerstone of recent pedagogical theory. Blogs, Wikis, and RSS provide a means to encourage, livelier, and make visible the social construction of knowledge that such theory postulates, and it is incumbent on teachers to embrace such tools where their use is beneficial to learners and teachers alike. They provide a useful prompt for the further rethinking of teaching practices in the pursuit of supporting socially constructed learning practices[429] (Duffy, 2012). Duffy and Bruns claim that learners prefer electronic discourse through social interaction. Blogs are a source of public written reflection; blogs have changed the dynamic of teaching rhetorical sensitivity and reflection[430].

The Exploratory Dialogue approach encourages children to explore the Internet's technological tools to search for educational materials. The teacher and children are encouraged to create their own Blog and make use of the Blogs for sharing of knowledge learning in the class. The teachers are the children's role models for content creation with the use of technological tools in classroom teaching. This means, teachers have to initiate their own Blogs in order to facilitate learning. Purcell, et al. (2013) have the evidence about the technological devices and tools usability in helping students' learning[431]. They argue that the results from teachers in Advanced Placement and National Writing showed a wide variety of digital tools have been used by students and teachers: i.e. mobile phones, tablets and e-book readers. The teachers claim that they use digital tools for students' research. Furthermore, the assessment and the submission are being conducted online[432] (Purcell, et al. 2013). With these works, classroom lesson or topics of discussion could be explored through the Blog. The content creations made by teacher provide a way of knowledge understanding and sharing of ideas to children. Children then imitate the knowledge sharing with others.

[429] Duffy, P., Engaging the YouTube Google-Eyed Generation: Strategies for Using Web 2.0 in Teaching and Learning. Edited by Melanie Ciussi and Erik Gebers Freitas, 2012. *Leading Issues in E-learning Research: For Researchers, Teachers and Students,* Volume 1.
[430] Ibid. pp. 31-39.
[431] Purcell, K., Heaps, A., Buchanan, J. and Friedrich, L., 2013. *How Teachers are Using Technology at Home and Their Classrooms.* National Writing Project, College Board and Pew Research.
[432] Purcell, K., Heaps, A., Buchanan, J. and Friedrich, L., 2013. *How Teachers are using technology at home and their classrooms.* National writing project, College Board and Pew Research.

Thus, the benefits are shared and everyone can have their voice to talk or write. This, I contend, is the significance of the Dialogic Framework - a framework that stimulates learning. The framework leverages technologies resourceful devices and tools to children's intellectual development. As a result, the framework hopes to produce intellectual thinking individuals. The evidence about the significance of Blogs is claimed by Allison Sawmiller (2010)[433]. Sawmiller wrote about the use of Blogs in classroom learning. She is a junior high/high school teacher at Crestview High School, Convoy, Ohio, USA. She claims that a Blog is a collection of students' entries on commentaries, videos, pictures and journals. The user or the reader stays updated with blogs. The sharing features are beneficial for writing samples, pictures and videos with friends and family. This sharing allows collaborative work for classroom learning, which can increase motivation, challenge critical thinking skills and aid in differentiated instruction. Besides, with Blogs, learners extend the classroom walls (Sawmiller, 2010).

With Sawmiller's argument, the Exploratory Dialogue aims for the same kind of connectivity among children and teachers in Malaysia. The use of Internet technology tools such as Blogs or Wikis, stimulates Malaysian children to be independent and motivated to explore learning opportunities on the Net. Through the use of social tools and the social interactions, we understand that children learn and develop. Hence, this approach leverages children's social interactions with their teachers during learning processes. The exposure of Talk or Dialogue between them develops thinking, recognising and exchanging of opinions. Children not only read, but observe and gain experiences with teachers through gestures and discussions. Barnes and Todd (1995) argue that learning is not just reading, listening and writing. But, learning includes the use of gesture, diagrams and tools. Learning is more distinctive in its own processes of social interaction, the use of tools and the relationship between teachers and learners. Teachers and learners are two parties that need each other's support, views and exchanges of ideas in learning values. As a result, the quality of learning

[433] Sawmiller, A., 2010. *Classroom Blogging: What is the Role in Science Learning?* The Clearing House, 83: pp. 44–48. Copyright Routledge Taylor & Francis Group, LLC.

outcomes will be achieved[434]. The Dialogic Framework stresses that with the use of technological tools, children internalise their psychological functions of perception, attention, sensory motor-operations and memory to solve learning problems. Vygotsky claims that children internalise intermentally and intramentally through their social interactions and involvement with the society where they live. As a result, children speak, learn and play with the use of social tools[435]. The use of social tools and speech are described as the processes of action and thought that mediate children in achieving their desired goals.

Duffy and Bruns (2006) argue that blogs provide educational value. Within a personal academic perspective, a Blog can reflect on teaching experiences[436]. The educational values of reflection in teaching experiences are important to children. In the classroom, a teacher can use his or her Blog to share those experiences with children. Children and teachers can share educational or non-educational materials for both self-reflection and motivation. The Exploratory Dialogue emphasises children and teacher's engagement in the Blogs that can reflect on many educational experiences i.e. teaching and learning in schools, working with schools, working with educational department and much more. Sometimes, children are shy to share in the classroom, but, they are not shy to share in the Blogs. As Sawmiller (2010) has argued, there are students who do not have a voice to speak with the class. This is due to the social pressures of adolescence. The teacher has problems in understanding these children. Thus, a Blog, she claims can provide this type of child a voice to speak freely on a topic. They can also ask question directly and communicate with many other students by using feedback boxes ready made on a blog. This ownership is good for the silent students[437] (Sawmiller, 2010).

The Exploratory Dialogue allows Talk opportunity for shy children with the ZPD concept. The ZPD concept stresses teachers' guidance and support are required in motivating these

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[434] Barnes, D and Todd, F., 1995. *Communication and Learning Revisited*, Portsmouth, NH: Heinemann.
[435] Cole, M., John-Steiner, V., Scribner, S. & Souberman, E. (Eds.). 1978. *Vygotsky, L. S. Mind in Society: The Development of Higher Psychological Processes*, pp. 52-57, Cambridge, MA: Harvard University Press.
[436] Duffy, P. and Bruns, A., 2006. The Use of Blogs, Wikis and RSS in Education: A Conversation of Possibilities. *In Proceedings Online Learning and Teaching Conference* 2006, pp. 31-38.
[437] Sawmiller, A., 2010. *Classroom Blogging: What is the Role in Science Learning?* The Clearing House, 83: pp. 44–48. Copyright Routledge Taylor & Francis Group, LLC.

children's learning. For example, the teacher can encourage shy students to write in the Blogs: e.g. writing a story competition or nominees for the best storyteller of the month. Hence, these shy children will blossom and become confident to write and talk in front of the classroom. Vygotsky emphasises that children's higher psychological functions of perception and attention contribute to learning and solving the problem at hand with the use of social tools. Vygotsky showed a study of choice behaviour in children with the use of social tools. Vygotsky illustrated that young children show a changing relationship between perception and motor action. The relationships of these two transformations are very important to their perceptual processes and other intellectual activities (Cole, et al, 1978)[438].

In addition to that, I contend, this approach develops children's behaviour, perception, attention, sensory-motor-operations and memory, stimulated with the technological tools. The use of the tools such as Blogs, RSS feeds or Wikis will develop their motor action; children are able to progress for more intellectual activities. This means, the Exploratory Dialogue approach develops children's motor action. This motor action activates two transformations in children which are: their psychological functions and cognitive processes. Thus, the approach generates other learning actions. Duffy and Bruns argue that children and teacher are knowledgeable to discuss professional challenges and offer teaching tips for knowledge sharing with gathered experiences[439] (Duffy and Bruns, 2006). Teachers' creation of Blogs to list homework assignments and link to other important documents for children's learning possibilities are endless (Sawmiller, 2010). The teacher may use a blog to produce an online gallery of student's work, pictures of the class's undertakings in Science and assignments. These works can then be linked to documents, video and pictures for learning, journal entries between students and teachers, writing prompts and newsletters[440] (Sawmiller, 2010). For that reason, the Exploratory Dialogue emphasises teachers' encouragement for children's exploration of learning by visiting their teachers' Blogs. Many more useful tips on learning will be garnered from visiting each

[438] Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., (Eds.) 1978. *L. S. Vygotsky, Mind in Society: The Development of Higher Psychological Processes*, pp. 33, Cambridge, MA: Harvard University Press.
[439] Ibid. pp. 31-39.
[440] Sawmiller, A., 2010. *Classroom Blogging: What is the Role in Science Learning?* The Clearing House, 83: pp. 44–48, Routledge Taylor & Francis Group, LLC.

other's Blogs between these children and teachers along the way. These include: syllabus reference, getting information, reading lesson topics, and preparing for topics' discussion etc. As such, children are kept up-to-date and well prepared in the classroom. Children can also have up-to-date information on the lessons between classes. Blogs give a platform for individual expression, support reader commentary, critique and subsequently interlink[441] (Duffy and Bruns, 2006). They highlight that within a pedagogical perspective, blogs support literature readings and student response. Also, Blogs are the space for students to act as reviewers for course-related materials and images. For example, the online gallery space gives children an opportunity to review other colleagues' work and writings and they can also make use of the commenting feature[442] (Sawmiller, 2010).

Research by Kristen Purcell, Alan Heaps, Judy Buchanan and Linda Friedrich (2013) on *How Teachers Are Using Technology at Home and in Their Classrooms*[443] provides the evidence. Purcell, et al. showed the evidence that digital tools are widely used in their classrooms and professional lives. They are all teachers of the Advanced Placement and National Writing Project. They claim that the Internet has had major impacts on their teaching and classroom work. The findings show that 92% of teachers say that access to the Internet contributes to their ability to access content, resources, and materials for their teaching. 69% of teachers says that the Internet contributes to their ability to share ideas with other teachers. 67% of them say that the Internet contributes to their ability to interact with parents. Lastly, 57% of them say that the Internet contributes to their ability to interact with students.

In summarizing their findings, the technological tools are a fast and easy platform for children's interaction with teachers and others. The Blog allows for self expression inside or outside the classroom, sharing of articles, images and video clips with teachers and friends. These activities stimulate children's creative thinking and communication skills from time to time with teachers' supervision and guidance. This way, children practice their ability to

[441] Duffy, P. and Bruns, A., 2006. 'The Use of Blogs, Wikis and RSS in Education: A Conversation of Possibilities'. *In Proceedings Online Learning and Teaching Conference* 2006, pp. 31-38.
[442] Sawmiller, A., 2010. *Classroom Blogging: What is the Role in Science Learning?* The Clearing House, 83: pp. 44–48. Copyright Routledge Taylor & Francis Group, LLC.
[443] Purcell, K., Heaps, A., Buchanan, J. and Friedrich, L., 2013. *How Teachers are using technology at home and their classrooms. National Writing Project*, College Board and Pew Research Center.

respond critically and write heartily with a teacher's guidance. The evidence from Purcell, et al. shows that 75% of Advanced Placement and National Writing Project teachers agreed that the internet and other digital tools have added new demands to their lives. They state that these tools have a "major impact" by increasing the range of content and skills about which they must be knowledgeable. 41% claims that these tools have a "major impact" for the teachers to work on their part to be an effective teacher. The use of learning journals provides reflection in many ways to the learners[444] (Boud, 2001). A learning journal is a systematic record of a person's learning in the subject, a topic, a course or about the experience of learning in general. As a result, the approach inspires Malaysian children in journalism skills. The skill allows online interaction, to interlink and reflect on ideas, talk and comments among children. These elements promote further exploration of learning activities. However, the AP and NWP teachers are also concerned over the use of search engines, i.e. Google. They argue about students' over reliance on the search engines for information findings. Students' associate research with Googling, they use the search engines in lieu of the traditional sources without adequate judgement on the quality of the information they find online. The results show that 76% of the teachers strongly agree that the search engines have conditioned students that information is easy and quick to get. 83% say that today's digital technology discourages students from a wider range of sources for research. 60% say that the digital technologies limit students' ability to use credible sources of information.

On the other hand, the teachers claim that 99% use the search engines to do their work and to find information online. 73% of AP and NWP teachers are "very confident" in their online search abilities. 99% said that the internet is for them to do work or research for their job. Their results showed that these teachers are concerned with the use of the Internet in general by the students. The teachers state that they however are confident that children are able to use the tools effectively.

[444] Boud, D., 2001. Using journal writing to enhance reflective practice. In L. M English & M. A. Gillen (Eds.), *Promoting journal writing in adult education: New directions in adult and continuing education*, no. 90: pp. 9–18. San Francisco: Jossey Bass.

The Physical Functions Dialogue approach

The Physical Functions Dialogue approach is a teaching and learning activity methodology for children's intellectual development inside and outside schools. This approach emphasises activity games that develop children's psychological functions of perception, attention, sensory-motor operation and memory in stimulating learning. Similarly, this approach is learning with Talk or Dialogue, the use of interactive technological devices with activity learning. However, the activity games take place outside from school's classrooms. Vygotsky claims that human higher psychological functions of perception, attention, sensory motor-operations, memory, language and action change comprehensively in the course of using language or speech[445]. This approach underpins Vygotsky's theory of human higher psychological functions with the use of language, social tools, social interaction and play. Vygotsky argues that those processes are linked to children's development from their early years. Therefore, this approach is designed for children's intellectual learning that is stimulated through Talk or Dialogue over learning activities and games.

The operational method for this approach addresses children's body system and senses – which are the higher psychological functions as mentioned above. These higher psychological functions are important for learning development with the use of technological tools and Talk in the learning[446]. The approach reinforces the use of interactive mobile technology gadgets, handheld devices or wireless networking in stimulating these functions. The approach accentuates the interaction of these tools with group members and teachers that will help children's learning acquisition.

In turn, I will explain the theoretical background of the approach. Then, I describe the proposed activity games. Following the explanation, I will discuss the argument and evidence made by the scholars about the learning activities.

[445] Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., 1978. *L. S. Vygotsky. Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press.
[446] Ibid. pp. 55-57.

The theoretical background

The Dialogic Framework addresses the critical needs of learning for children. Their learning needs are crucial to be taken into account with this approach. The Talk or Dialogue approach emphasises teacher and children's participation for learning accomplishment. Teachers' friendly interactions and the use of technological tools with the ZPD concept are an important basis of learning. The ZPD concept debates that the adult's intellect provides temporary support for the child until a new level of understanding has been achieved[447] (Mercer and Littleton, 2007). Effectively, the ZPD concept reduces the chance of failure in carrying out the task or problem, while at the same time encouraging efforts to advance[448].

This approach of learning is important to Malaysian children as evidence has been written by Rahman, et al. Rahman, et al.'s research findings show that students in Malaysia prefer tactical, visual and auditory teaching alongside emotional support and teacher's encouragement[449]. Elsewhere, Bruner (1978) stresses the use of dialogue to pedagogy, culture, collaboration learning-related implications and how they build children's cognition[450]. Mercer and Littleton, (2007) emphasise dialogue as a sociocultural learning approach in the classroom[451]. Mercer and Littleton mentioned Underwood and Underwood (1999). They established evidence that a pair of children working together on a computer-based problem-solving activity achieved best results in terms of expressing opinions, analyzing the situation in words and expressing agreement and understanding. This approach emphasises collaboration activity learning. Evidence shows that collaborative learning withstands discussion amongst children. Thereby this will help children solve problems and promote learning[452] (Underwood and Underwood, 1999). The Dialogue approach promotes children's interthinking of tasks and

[447] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children's Thinking, A Sociocultural Approach*, London: Routledge.
[448] Ibid. pp. 15.
[449] Rahman, S., Abdullah, M. S., Yasin, R.M., Meerah, T. S. M., Halim, L. and Amir, R., 2011. Student Learning Style and Preferences for the Promotion of Metacognitive Development Activities in Science Class, *World Applied Sciences Journal 14, Special Issue of Innovation and Pedagogy for Diverse Learners*: pp.11-16.
[450] Bruner, J. S., 1978. *The Role of Dialogue in Language Acquisition*, in A. Sinclair, R. Jarvella and W. Levelt (eds.) *The Child's Conception of Language,* New York: Springer-Verlag.
[451] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children's Thinking, A Sociocultural Approach*, London: Routledge.
[452] Underwood, J. and Underwood, G., 1999. *'Task Effects in co-Operative and Collaborative Learning with Computers'.* In K. Littleton, and P. Light (eds.) *Learning with Computers: Analyzing Productive Interaction,* London: Routledge.

inter-creativity of the activities for shared learning[453] (Mercer and Littleton, 2007). Mercer and Littleton assert that through teachers' continuous support and supervision, children will develop the intermental and intramental psychological processes of analyzing tasks and solving problems independently[454].

The approach stresses the intermental and intramental psychological processes. The psychological process means the use of children's speech, action, perception, attention, sensory- motor operations and memory in developing learning. Simply put, the psychological processes of children's action and response with teacher's guidance promote learning activity. Hence, through guided participation, children will shift from socially regulated to self-regulated activities [455] (Goswami and Bryant, 2007).

Vygotsky claims that the psychological functions, social interaction, the use of social tools, the speech and play are linked in children's learning development. During these processes, children internalise their higher psychological functions for the 'stimulus –response relation' with the artificial stimuli. The 'stimulus–response relations' is the process by which children speak, observe, feel and touch, using social tools, which arouses learning. Vygotsky claims that speech is the sign-operational activity in children. He terms 'speech' as the intermediary link with the use of social tools. The 'speech' is highlighted in Laurillard's - Conversational Framework (2002)[456], Mercer's - the Thinking Together approach (2004), the Exploratory Talk by Barnes and Todd (1977)[457], and the Dialogic Teaching by Alexander (2008)[458]. Laurillard's Conversational Framework underpins the ZPD concept by Vygotsky, that claimed, teacher and children's educational attainment could improve with the help of adults, parents and teachers with the use of Talk.

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[453] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children's Thinking, A Sociocultural Approach*, London: Routledge.
[454] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children's Thinking, A Sociocultural Approach*, London: Routledge.
[455] Goswami, U., Bryant, P., 2007. *Primary Research Survey 2/1a, Children's Cognitive Development & Learning,* Copyright © University of Cambridge; 1962. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press; Bruner, J.S. and Weinreich-Haste, H., 1987. *Making Sense: The Child's Construction of the World*.
[456] Laurillard, D., 2008. *Rethinking University Teaching– A Framework for the Effective Use of Learning Technologies.* 2nd Edition. London: Routledge/Falmer.
[457] Mercer, N., 2000, Mercer, et al., 1999, Wegerif, Mercer, et al., 1999, Dawes, L., 2005, Littleton, et al. 2005
[458] Alexander, R. J., 2008. *Towards Dialogic Teaching – Rethinking Classroom Talk*, 4th edition. Cambridge: Dialogos.

This approach shapes learning activity with games and the use of interactive technological devices for group activities. This approach allows children's exploration and engagement skills in learning activity games to treasure their tropical nature's surroundings. In turn, I explain the activity games in detail.

Vygotsky argues that artificial stimuli such as social tools are able to control children's learning behaviour. And, the higher psychological functions of perception, attention, sensory-motor operations and memory generate children's action[459]. Laurillard places an emphasis on teacher's intervention in imparting knowledge to learners beyond learners' experience. She argues that learners need to use and reflect on it. As such, learners are able to change their perspective on that particular knowledge and apply it. Hence, learners are able to understand the meaning of that knowledge that they have gained and change the way they experience the world[460].

This approach values Talk or Dialogue and the use of technological devices for activity games with the ZPD concept. In ZPD concepts, Vygotsky argues, social context influences child development. The adults' guidance and motivation are core to children's development. Therefore, this approach upholds the Talk with the ZPD concept for children's intellectual knowledge and understanding. Laurillard put emphasis on the teacher's role as a knowledge provider for learners' to reflect experience and share resources. She explains that teaching must adapt to the learning of description of the world, not just the analogy of situated learning of the world. This Physical Function Dialogue emphasises teacher support and help with the activities.

This study concludes that knowledge is acquired by our personal experience through the contextualization of social interaction, life, culture and the world as a whole. The Physical Function Dialogue approach sustains the talk and activity games as the representation of the world to children's learning attainment. With this type of activity game, children have the chance of internalizing their psychological functions. That is through social interactions with

[459] Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., 1978. *L. S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press.
[460] Laurillard, D., 2008. *Rethinking University Teaching – A Framework for the Effective Use of Learning Technologies*, 2nd Edition. London: Routledge/Falmer.

the natural habitats, flora and fauna and technological devices through their senses of touch, observation, smell, etc. for intellectual learning.

Hence, with this understanding, this approach emphasises Talk that can be obtained through interaction with people, the activity games and technological tools for their learning success. In this respect, this approach underpins Rogoff's (1990) argument about contexts giving meaning to content, meaning appears from the relationship between content and its context[461]. Her argument describes that in a social context, children speak and socialise. Their speech produces the cognitive contextualization of learning and knowing processes for learning development. Children Talk or Dialogue for the coordinated activities of the learning tasks. This activity requires cooperation between them in understanding the lessons that they have learned. They have to work together in order to produce results; the interthinking over tasks and problem solving skills are gained together. In view of that, this approach provides learning and knowing processes that are developed through the corresponding accomplishments of tasks in the learning context. The approach allows children to coordinate activity together in a group, thus, they talk, discuss and share ideas or problems between them. Rogoff wrote "… *Partners continuously maintain interaction, cooperation and interthinking through their activities. These coordinated activities form human's meta-cognition that gives meanings*[462]. Therefore, these activity games provide children's understanding of knowledge realization through interactions with nature, their participation in the activities and many other learning encounters. Therefore, these experiences allow children to learn the meaning of the world.

Accordingly, this approach is a situated context of learning content as argued by Lave and Wenger (1991). They maintain that situated cognition interprets thinking as never exactly the same for any two individuals or in any two contexts[463]. Simply put, thinking is embedded in the context of the task or activity at hand which then draws on social, cultural, and material resources for intellectual development. To be precise, cognitive processes do not reside solely

[461] Rogoff, B., 1990. *Apprenticeship in Thinking: Cognitive Development in Social Context,* Oxford: Oxford University Press.
[462] Rogoff, B., 1990. *Apprenticeship in Thinking: Cognitive Development in Social Context,* Oxford: Oxford University Press.
[463] Lave, J. and Wenger, E., 1991. *Situated learning: Legitimate peripheral participation*. New York: Cambridge University Press.

in one's mind or the classroom only. Learning and cognitive processes involve relations between a person and a situation as demonstrated in this approach. Children learn through activity games situated within the required learning field. Consequently the term "Enculturation" put forward the meaning of culture, or adopting the norms of children's behaviours, skills, beliefs, language and attitudes of the activity games and the learning environment. This approach allows a new learning and understanding of games and nature within the Malaysian heritage of flora and fauna, activity and interaction. Consequently, the children will gain understanding of the holistic view of interaction, dialogue skills, and attitude towards learning.

The above arguments provide multiple concepts of children's speech in learning that are important to this approach. The Physical Function Dialogue approach fosters Malaysian children in experiencing manifold perceptual levels of knowledge understanding. This understanding will enable them to access knowledge acquired through their own body system of senses and thinking abilities. As a result, children will progress with their understanding of the world. Laurillard wrote… *"Teaching may use the analogy of situated learning of the world, but must adapt it to the learning of descriptions of the world"*[464]. She maintains that teaching has to go beyond the specific experience that the teacher has given. Laurillard's statements resonated with the ZPD concept of managing and guiding children's activity games in this approach. The teachers and the group members present themselves for experiencing a new learning setting. They acquire different contexts of learning operations and atmospheres which provide new achievement. This way, children identify the differences of learning outcomes, evaluations and results.

The activity games proposed

This approach identifies two models of activity games for learning. This learning activity intends to exploit interaction capabilities in children from different engagement that creates

[464] Laurillard, D., 2008. *Rethinking University Teaching – A Framework for the Effective use of Learning Technologies,* 2nd Edition. London: Routledge/Falmer.

active learning exposures. The game outlines are: the Treasure Hunt and the Tropical Trail. The Treasure Hunt is designed for children's physical and psychological functions in searching for a treasure box. This learning activity requires children to work in a team to find clues, discuss strategies, plan movement, search for the treasure box and explain outcomes. These activities prepare children for critical thinking skills such as information searching and problem solving. These skills allow knowledge sharing among the children through intermental and intramental psychological processes of interaction with physical objects and tools. These are the intermental and intramental psychological processes that develop children's perception, attention etc. These psychological functions generate the stimulus and response relation of Talk with the technological devices. Apart from these processes and activities, children are required to finish the paperwork in the classroom. They then produce reports, summarise results, showcase presentation (picture or video) and reflect on the experience. The reflection of experience can be done with the technological devices in the form of essay writing and shared in the classroom. Lastly, the teacher needs to guide and access children's work throughout the activities.

The second game is the Tropical Trail. This game is to explore and identify the beauty of tropical forest flora and fauna. The activity includes: visit, picnic, camping, fishing and river bathing. This game is based in group activity and with teachers' supervision. The activities are such as: identify the flora and fauna, describe the object, search object information, draw object, picture and record object. The places proposed are such as hot spring, water catchment area, waterfall and river over a safe forest area. The activity outlines the use of children's senses of smell, touch etc, and their skills to catch, move, and fact find with the technological tools. Besides these, the group activity of camp building, managing security and cooking are needed. With teachers' help, these activities are exciting and attain learning. In addition to that, games that promote healthy competition such as fishing, catching butterflies, making sand sculptures and tug-of-war are encouraged. Lastly, the activity requires report writing, storytelling, picture displays for presentation and assessment in the classroom.

These activities promote children's awareness over the tasks that they are actually doing. Children are involved with multi different levels of engagement of plans, discussions and performance over the activities. For example, the activities that are being done have different procedures and concentrations. The activities require children to place special consideration and attention. Therefore, children are actually listening, talking and considering over the activities that must be adhered to multiple perceptual, attention, memory and sensory-motor operations levels. The activities enable them to interact with more material through different senses. This provides additional analysis and thinking processes in learning.

These two learning activities, I contend, are important to children's intellectual development. The approach relates to the scenario in Malaysian co-curriculum activities. Research on the Malaysian extra curriculum activity by M. Jamalis and M. S. Omar Fauzee (2007) discusses the learning activity context. Their article entitled *Developing Human Value through Extra Curricular Activities for the Journal of Human Resource and Adult Learning*. They argue that Malaysian school children socialise with friends and develop a leadership role in extra-curriculum activities. Malaysian children participated in after-school activities because of their own interest in attaining new knowledge and the desire for self-development (Jamalis and Omar, 2007)[465]. This evidently signifies Malaysian children prefer school extra-curricular activities. They claim that results showed that most of the students participated in extra-curricular activities because of their own interest in gaining extra knowledge for self-improvement, their own intrinsic interest, socializing with friends and most importantly developing a leadership role.

The scholars' evidence

In 2004, Price and Rogers published their learning activity games papers. Their article '*Let's Get Physical'* explains the significance of interaction with general computer

[465] Jamalis, M. and Fauzee, M. O., 2007. Developing Human Value Through Extra Curricular Activities, *Journal of Human and Adult Learning*, 3(1).

technologies, handheld devices and wireless networking that stretch children's learning development and support active learning[466]. Price and Rogers (2004) argue that using physical functions in a cognitive type of learning has the potential to develop children's intelligence and extend their learning activities. The use of technological devices stimulates children's cognitive learning development, stretches their learning capabilities and supports active learning activities[467]. Price and Rogers did a few types of physical experiments on children's learning. One involved physical movement with uncovered eyes and ears. By interacting with probing devices and a computer display, the physical movements produced digital information and combined artefacts through tagged objects. Their research shows that digital devices can be designed to exploit interaction capabilities. Their research argues that digitally augmented physical spaces can promote children's learning through the engagement between children and technological devices. The engagement creates an active learning environment for children.

Their findings show that learning, coupled with the technological devices contributes to five key areas in children's learning development. Firstly, it is in the children's awareness. Children are aware about what they are actually doing at many different levels. For example, the objects that are being manipulated have different functionality and children have to put special attention and focus on the activity. Besides that, the children's awareness recorded at multiple perceptual levels enables them to access more information through different senses. This provides rich reflection about the world. On top of that, the children's awareness of the relevant focus of contextual information affords more attention in highlighting any aspects of the physical world in certain locations. These findings are important to Malaysian children in explicating the use of technological tools in a deeper level of analysis.

Secondly, this approach offers richer experiences than classroom learning; experiences such as: interaction with the spaces being more than just visual. The feeling of experience entailed all senses, i.e. the sounds of nature and couplings through a variety of modes simultaneously or

[466] Price, S. and Rogers, Y., 2004. Let's Get Physical: The Learning Benefits of Interacting in Digitally Augmented Physical Spaces. *Computers & Education* 43, 2004: pp. 137–151.
[467] Ibid. pp. 137–151.

separately. These experiences offer great diversity or perceptual information which is reflected in the different environment and discoveries that children made. Thus, children have the opportunity to physically collect the data by themselves and re-represent it digitally.

Price and Rogers assert that their finding show that children are able to manipulate their findings from the activities and make their own hypothesis. They claim that children's anticipation and contemplation during the process of using the technological devices show unexpected effects, i.e: the sound made in the habitats such as a butterfly sipping nectar, walking past plants e.g. a thistle. These effects provoked children into understanding acquainted and unacquainted actions or effects of things that they often overlooked. Moreover, Price and Rogers discovered children's capabilities in exploration skills of nature. The activity gave high levels of exploration and discovery. They claim that the experiences were personally meaningful as children can reflect on their learning; an activity named the Ambient Wood this is the most evident, which generates greater results of active learning. The collaboration of working spirit has shown in these children. They work together for diverse forms, using digitally augmented experiments. The on-going learning or playing experience is brought up for comments and questions as part of the process activity. More verbal engagement happens between them and it promotes greater exchange of ideas and suggestions. This type of learning, according to Price and Rogers, gives extra engagement that can in turn affect children's cognitive development, especially their attention, inquisitiveness and ability for reflection[468].

In conclusion to the Price and Rogers' findings, the Physical Function Dialogue approach promotes this kind of activity to Malaysian children. The activity such as the games and competitions stimulate active learning in children. This approach allows computer-based interactions with physical spaces and their psychological functions to promote active learning. This approach allows for children's exploration skills of their talking and technological skills, in extending the range of use of physical actions and interactions. This approach lets children trigger, obtain or make present the learning activity or playing together. A number of combinations of actions and interactions this approach has outlined allow children's creative

[468] Ibid. pp. 137–151.

exploration. The authenticity of experiment provides Malaysian children the means of interaction and collaboration with the physical objects and environment. As a result, children and the teacher are highly engaged and creative in their learning experience.

The teachers' benefit

As we understand the Exploratory Dialogue, the approach emphasises the use of technological devices to benefit children and teachers. Similarly, the Physical Function Dialogue is the same. This approach highlights the use of the technological tools inside and outside classrooms. Research by Purcell, et al. (2013) provides evidence about the use of the technological devices to help teaching and learning[469]. They argue that the results from teachers in Advanced Placement and National Writing showed a wide variety of digital tools have been used by students and teachers: i.e. mobile phones, tablets and e-book readers. The results showed laptops, desktops and mobile technological devices common to students and teachers. 73% of the teachers say that they and/or their students use their mobile phones in the classroom or to complete assignments. 45% say that they or their students use e-readers and 43% use tablet computers in the classroom or to complete assignments. Teachers use digital tools for students' research and assessment as the submissions are being conducted online. Some teachers employ students' interactivity through Wikis, they engage online for discussions and edit collaborative work with GoogleDoc. These, in part, increase the level of children's motivation while learning[470] (Purcell, et al. 2013).

The above evidence is the manifestation of the use of digital technologies for learning. As a result, this evidence supports the Dialogic Framework approaches for Malaysian children and teachers. Teachers and children are involved and collaborate online. In summary, the Dialogic Framework allows teachers involvement and collaboration for classrooms, outside classrooms and online. The approach brings together the collaboration of teaching and learning, Talk or

[469] Purcell, K., Heaps, A., Buchanan, J. and Friedrich. L., 2013. *How Teachers are Using Technology at Home and Their Classrooms.* National Writing Project, College Board and Pew Research Center.

Dialogue, activity lessons and games, email communications and many more. Talk or Dialogue is important in learning; inside or outside classrooms. The technological devices and tools such as hand phones, notebooks, iPads and Tablets allow useful production of learning with ease. These activities help contribute to children's intellectual development.

The Malaysian learning context

In 2005, Malaysia utilised Information Communication Technology (ICT) in the smart school classroom. The major cities such as Kuala Lumpur, Petaling Jaya, and Subang Jaya were selected. Malaysia's *Vision 2020* policy (1991) states that by the year 2020 Malaysia will be fully ICT developed. The Malaysia Education Department (MED) with the Malaysia Multimedia Development Corporation (MMDC) outline *"The Smart School Roadmap 2005-2010"* has been achieved. The roadmap systematically reinvented the teaching and learning that integrated ICT for all Malaysian Smart Schools as well as the management processes. The Smart Schools replaced normal schools with ICT with broadband internet access, as well as technology implementation and system maintenance. Thus, the facilitation of the ICT into teaching and learning efforts in financial management, budgeting, teacher training, staff allocation, facilities, assets etc. is critical to be looked into. Therefore, the Dialogic Framework is timely to be recommended in the Malaysian teaching and learning approach. The approaches put together the use of Talk, activity and learning in the classroom with technological devices.

Singh and Garba (2011) argue that the Interactive White Boards (IWB) /Smart Board technology facilitates Malaysian students' motivation and achievement[471]. They claim that the use of the technological tools such as IWB is rather new to the teachers. However, their research indicates the readiness of the Malaysian teacher to incorporate teaching with technological devices. Their findings show that Malaysian teachers are positive and prepared to use IWB in classroom teaching. The IWB allows sharing of learning content from many sources that can be displayed simultaneously on a Smart Board screen. This includes CD-

[471] Ranjit Singh, T. K. and Garba, S. A., 2011. Teaching in the Information Age: How Prepared Are Teachers in Malaysia? *Proceeding Seminar for the Dean in the Educational Institutions.*

ROMs, websites, DVDs and television[472]. In Malaysia, teaching and learning have started to include the use of computer-related media such as images, video, sound clips and internet content via the IWB. The IWB makes classroom communication more interactive and activity-orientated between the teacher and the children.

S. Rahman, M. S. Abdullah, R.M. Yasin, T. S. M. Meerah, L. Halim and R. Amir (2011) wrote about students' learning. The research entitled *'Student Learning Styles and Preferences for the Promotion of Metacognitive Development Activities in Science Class'* mentioned a study conducted by Dunn, R and K, Dunn (1999) on learning using the visual, auditory, tactual and kinaesthetic[473]. Dunn and Dunn's findings show that students can reinforce their memory for learning information by listening to spoken words and verbal instructions. This happens especially when a child listens to audiotapes, tutors, other students and discusses the material with the teacher. Meanwhile, students prefer information presented in visual form. Students remember and understand better through reading. Some students prefer to learn through hands-on activities such as experiments, lab work and by building models. The physical movement in the classroom helps students understand new information. Kinaesthetic learning is through physical experience, active involvement in learning activities and the stimulating combination of learning. These might include tapes of activities, field trips and role play which can also help students understand new things[474] (Rahman, et al., 2011). Rahman, et al. also claim that students in Malaysia prefer visual, auditory, tactual and kinesthetic teaching alongside emotional support and teacher encouragement[475]. This move is not new in Malaysia as more and more research is promoting the use of mobile technologies to be integrated into learning,

[472] Ranjit Singh, T. K. and Garba, S. A., 2011. Teaching in the Information Age: How Prepared Are Teachers in Malaysia? *Proceeding Seminar for the Dean in the Educational Institutions.*
[473] Dunn, R and Dunn, K., 1999. *The Complete Guide to the Learning Styles Inservice System.* Needham Heights, MA: Allyn and Bacon.
[474] Rahman, S., Abdullah, M. S., Yasin, R.M., Meerah, T. S. M., Halim, L. and Amir, R., 2011. Student Learning Style and Preferences for the Promotion of Metacognitive Development Activities in Science Class, *World Applied Sciences Journal* 14, *Special Issue of Innovation and Pedagogy for Diverse Learners:* pp. 11-16, IDOSI Publications.
[475] Ibid. pp. 11-16.

including the teaching of English vocabulary,[476] Science and Mathematics,[477] Personalizing Learning,[478] etc.

The Dialogic Framework provides useful intellectual realization for children's experience. This approach allows children's physical and psychological functions developed with the use of technological devices bridges learning opportunities. The learning is anticipated and contemplated with actions and effects. The authenticity of the learning experiences in both mediums gives an extensive amount of collaboration. Both of which are considered in the literature to be important aspects of active learning.

The Physical Function Dialogue approach offers children intellectual learning through changes in the course of these learning activities. Vygotsky maintains that higher psychological processes are raised and experienced through changes in the course of learning and development. Vygotsky claims that children can determine their origin and then map their own history[479]. Profoundly, Vygotsky argued that there are cognitive learning processes in children with the use of social tools. The use of social tools or any artificial means by children is a transition operation in children's cognitive development[480] (Vygotsky, 1930). Having said that, this approach allows children to map changes in need of intellectual fulfilment. The exposure brought by Talk, discussion in the collaborative works and the use of technological tools broadens children's cognitive thinking. The benefits of IWB provides helpful organization of collaborative learning activity in the classroom. The activity of showcases for discussion can be done conveniently in a classroom with teacher and classmates. This idea is raised by Bell (2002)[481], Richardson (2003), Markett, Arnedillo, Sanchez Weber, and Tangney, (2006)[482].

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[476] Mohamad, M. and Woollard, J., 2012. *Mobile Learning in English Language Laearning: An Implementation Strategy for Secondary Schools in Malaysia.*

[477] Zakaria, E. and Iksan, Z., 2007. Promoting Cooperative Learning in Science and Mathematics Education: A Malaysian Perspective, *Eurasia Journal of Mathematics, Science & Technology Education,* 3 (1): pp. 35-39.

[478] Mat Khalid, M. S.and Raja Hussain, R. M., 2011. Designing To PLEaSE: A Case Study of Personalizing Learning for a Malaysian Secondary School.

[479] Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., 1978. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press; London, England.

[480] Ibid. pp. 19 – 30.

[481] Bell, M. A., 2002. Why use the Interactive White Board? A Baber's DosenReasons. *Teachers.Net Gazette,* 3 (1). Retrieved from Berson, M. J., 1996. Effectiveness of Computer Technology in the Social Studies: A Review of the Literature. *Journal of Research on Computer in Education,* 28 (4): pp. 486-499.

[482] Markett, C., Arnedillo Sanchez, I., Weber, S., and Tangney, B., 2006. Using Short Message to Encourage to Interactivity in the Classroom. *Computer and Education,* 46 (3): pp. 280-293.

Smart Boards promote useful learning strategies in the classrooms. The colourful features attract and retain students' attention and accommodate many types of learning styles (Bell 2002). Hence, with just one computer in a classroom, a Smart Board can maximise the usage to everyone. Smart Board is a beneficial tool that inspires creativity and critical thinking in the classroom with a camera that can document and video the activities. The learning is livelier for its interactivity features for teacher and children as multimedia resources connect the Internet and the class (Bell, 2002)[483]. Markett et al. (2006) argue that the Smart Board allows interactive multimedia instructions with text, pictures, music, and video clips that promote interest in students. The active learning environment gives students interactivity and motivation. Students are engaged together participating in the in-depth involvement with the various features of audio and video[484].

Conclusion

The Dialogic Framework is timely to be proposed in the Malaysian schools to increase children's motivation and interest in learning for intellectual accomplishment. Thus, the government achieves the goal of producing intellectual thinking Malaysian children. The framework allows significant learning engagement through teacher's interaction, Talk approach and use of technological tools. The use of Talk or Dialogue provides a closer engagement in the classroom, and develops children's attention, inquisitiveness and reflection. In summary, the Dialogic Framework reproduces Vygotsky's theory about the use of speech and tools, the ZPD concept, the children's speech, the shared knowledge and the situated cognition. Vygotsky's argument about children's speech being vital in reaching their goals[485] sustains this framework. Vygotsky argues that the use of social tools such as pencils or pens for writing, books for reading, and toys for playing with the interaction from parents, teachers and friends help children's learning. These activities are children's core social process. Vygotsky maintains that

[483] Bell, M. A., 2002. Why use the Interactive White Board? A Baber's DosenReasons. *Teachers. Net Gazette*, 3 (1). Retrieved from Berson, M. J., 1996. Effectiveness of computer technology in the social studies: A review of the literature. *Journal of Research on Computer in Education*, 28 (4): pp. 486-499.
[484] Markett, C., Arnedillo Sanchez, I., Weber, S., and Tangney, B., 2006. Using short message to encourage to interactivity in the classroom. *Computer and Education*, 46 (3): pp. 280-293.
[485] Ibid. pp.11-14.

the construction of knowledge and understanding is a naturally social process and activity. To sum up, this approach emphasises children's higher psychological processes of perception, attention etc. and mirrors Vygotsky's theory on children's speech and learning attainment. This framework underpins children's speech which develops learning with: the activity games, the classroom learning, the ZPD concept, the play, the intermental and intramental processes, the use of technological devices and tools, the Talk, children's speech and human higher psychological functions. These processes are the constructive processes in children's reproduction of learning accomplishment.

The government should endorse the Framework's rationales for Malaysian children's intellectual development. Ultimately, this study hopes that the government, schools, administrators and teachers help provide full support in making this framework a reality.

Section III - The advantages of the Dialogic Framework

The advantages of the Dialogic Framework

In the previous section, we examined the Dialogic Framework and its proposed implementation within the Malaysian Education System. We also discussed in detail the varieties of Dialogue that have been described as helping children's cognitive development and learning inside and outside the classroom. In this section, we explore the advantages of the Dialogic Framework with regard to children's intellectual development. This study acknowledges that there are many essential overlapping intellectual characteristics in children's speech with the use of technological devices and Internet tools. These characteristics outshine in this Framework.

These characteristics develop children's learning behaviour through the intermental and intramental processes. These intermental and intramental processes are: children's Dialogue and cognitive development, social interactions, play, the ZPD, the use of social tools, the stimulus and response relations and children's higher psychological functions. These processes affect children's psychological functions of perception, attention, sensory motor-operations, memory, speech, action and many more which caused children's psychological behaviours. The behaviours identified are such as: motivated and responsive, highly engaged and creative, educated discourse individual, action oriented and active, self-determination, self-control and learned, as well as accountable and mindful skills.

Motivated and responsive skills

The Framework allows children's learning excitement and response relation with the use of Talk and the technological devices in learning. A stimulus-response relation is seen, termed by Vygotsky as underpinning children's intellectual development with the use of social tools[486]. The Framework stresses the processes of physical and psychological functions that give a reaction with Talk, activity games, and the Interactive technological devices. By the ZPD

[486] Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., 1978. *L. S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press.

concept, children are motivated to use the technological devices in achieving learning outcomes. Hence, these processes give children learning reactions. The approaches have shown the evidence of children's behaviour through actions and operations which are motivated by the technological devices with Talk, Text, Chat, Dialogue or Play. The use of technological devices stimulates children's cognitive learning development, stretches their learning capabilities and supports active learning activities[487] (Price and Roger, 2004). Price and Rogers argue that these experiences offer great diversity of perceptual information which are reflected in the different environment and discoveries that children's made[488]. Children are active in achieving intellectual learning. Vygotsky argues that the unity of children's complex psychological functions of perception, speech, action and so on showed the process of internalization of the visual field which establishes the forms of human behaviour[489]. Vygotsky concludes that with the help of speech, a child uses his/her hands and eyes to solve practical tasks[490]. This Framework incorporates the use of Talk with group activities, the use of technological devices e.g. IWB, Blog, Wiki, RSS feeds and Internet in and out of classroom to stimulate learning. The approaches outlined children and teachers' participation in activity games, the use of IWB and Internet tools such as Blogs, Wikis etc. for knowledge and solving learning problems. In other words, children are motivated and responsive to the continuous circle of stimulus and response relation provided by the devices. These approaches are underpinned by the stimulus and the response activity theory of Vygotsky[491].

Highly engaged and creative

The Framework explains the stimulus and response relations of Talk with the use of technological devices and tools in children's intellectual development. The Framework stimulates active learning in children through physical explorations, games and computer-based

[487] Price, S. and Rogers, Y., 2004. Let's Get Physical: The Learning Benefits of Interacting in Digitally Augmented Physical Spaces. *Computers & Education* 43, 2004: pp. 137–151.
[488] Ibid. pp. 137–151.
[489] Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., 1978. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press. See Levina, R.E. for Vygotsky's ideas on the planning role of speech in children, *Voprosi Psikhologii*, 14, 1938: pp. 105-115. Although Levina made these observations in the late 1920s, they remain unpublished except for this brief explication.
[490] Ibid. pp. 33-34.
[491] Ibid. pp. 38-51.

interactions with technological tools and physical spaces. This type of learning permits children's exploration skills in extending the knowledge of familiar and unfamiliar physical actions and interactions. This Framework promotes children's enthusiasm for obtaining learning outcomes. As a result, children are highly engaged and creative in the learning experience. The Framework sustains Vygotsky's argument that the interpersonal interactions which occurred in learning settings and cultural psychology relied on the intercession by social, cultural and institutional processes at many levels. As Vygotsky wrote, *"... which increases via the direct influence of external stimuli and is characterized by its immediacy. Then he or she uses the second type of memory to create his next actions"*[492].

Vygotsky's statement shows the interpersonal (social) and intrapersonal (individual) aspects of children's learning development. The social level explains children experiencing the activity; interacting with friends and teachers, playing the forest nature games. Then the individual level explains how children internalise the knowledge gains for the learning process (with the use of technological devices). More precisely, the social level describes the relationship between children and teacher, and the flora and fauna. The individual level is inside the child when operating the devices to write, copy and paste, display etc. (intramental). Vygotsky explains that these intermental and intramental processes are the psychological processes for developing their cognitive thinking[493]. Hence, these processes are intellectual processes made by children with the use of technological devices.

The educated discourse individual

Mercer and Littleton claim that using Talks more effectively for learning, pursuing interests, developing shared understanding and getting things done help children extend their repertoire of language genres[494]. For example, Case Study Two - Chapter 3 shows the extract of children's learning in the classroom with the Socialised Speech and the Exploratory Talk. It is important to acknowledge that Talk propagates experience which helps children to build up learning

[492] Ibid. pp. 38-40.
[493] Ibid. pp. 31.
[494] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children's Thinking; A Sociocultural Approach.* London: Routledge.

together in a classroom. The Dialogic Framework approaches emphasise teacher's interaction and engagement with children. The healthy engagement that is shown by the teacher allows children to learn from each other and imitate their teacher. Thus, children are nurtured in a healthy environment of engagement with their teachers and friends in voicing their ideas, as well as accepting criticism positively during conversation. The teacher is obliged to help children in solving their problems. Children and teacher use the technological devices and tools for creating a new shared understanding of teaching and learning in classroom discussion, critical thinking skills, collaboration work and content creation. The use of phrases such as: why do you think that is so…, where do you think it should…, how about..., I think, because etc. trigger children's critical thinking. Both approaches emphasise critical thinking collaboratively with teachers' participation. This way, children are motivated to ask and respond to being asked. Mercer and Littleton argue that Talk in collaborative learning promotes learning[495]. Alexander, (2004) asserts that children learn comfortably when they are secure[496]. The Talk approaches allow children to engage in other activity tasks in Blogs and Wikis which reflect children's experiences in/outside the classrooms. The approaches explain children have undertaken of content creation, activity task and presentation in the classroom. This approach provokes children's ability for shared knowledge with educated discourse. So, these opportunities promote motivation and encouragement for Malaysian children to learn intellectual discourse. With this evidence, Talk approaches develop children as educated individuals capable of productive discourse.

Action oriented and active individuals

Vygotsky's theory of play explains that play develops children's self-confidence and independent skills. Vygotsky argues that children satisfy certain needs during play[497]. In summary, children create an imaginary situation when they are playing. This is because they

[495] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children's thinking, A Sociocultural Approach*, London: Routledge.
[496] Alexander, R., 2004. *Towards Dialogic Teaching: Rethinking Classroom Talk*, Cambridge: Dialogos.
[497] Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., 1978. *L. S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes.* Cambridge, MA: Harvard University Press.

desire to be someone else or do something new. In both approaches this study outlines, children and teacher operate technological devices and Internet tools for learning. The approaches promote learning through the exploration of the technologies, flora and fauna and physical spaces, a method of using Talk, technological tools with the ZPD concept in learning that stimulate children's perception, attention, sensory motor-operation and memory. The exploration of these spaces and technological devices requires children's movement, discussion, and engagement between them. Their activity games require engagement with subsequent multi-tasking that enables them to explore and solve learning problems. The engagement generates stimulation of learning experiences from a variety of tools, activities, tasks etc. around the learning area. So, the participation in the talk, movement, engagement, and support with these spaces and technological devices generates action and reaction. These actions and reactions contribute to children's educational attainments. Therefore, the learning is play that develops into numerous digital representations appropriate to points and types that children and teachers have established. This kind of learning satisfies children's needs, thus incites eagerness toward solving learning problems. This way, children are positioned to think, reflect and solve learning problems. Price and Rogers claim that interaction with technological devices stretches children's learning development and supports active learning[498]. With the teacher's help, children are stimulated to drive their own learning and understanding and shared knowledge among them.

Self-determination, self-control and learned individuals

The interaction through the use of technological devices and Internet tools is a way of fulfilling children's needs. Price and Rogers maintain that these tools stimulate children's cognitive development, stretch their learning capabilities and support active learningactivities[499]. The Dialogic Framework approaches emphasise the use of technological devices for Malaysian children so that they enjoy the learning process. The approach stresses

[498] Price, S. and Rogers, Y., 2004. Let's Get Physical: The learning benefits of interacting in digitally augmented physical spaces. *Computers & Education* 43, 2004: pp. 137–151.
[499] Price, S. and Rogers, Y. 2004. Let's Get Physical: The learning benefits of interacting in digitally augmented physical spaces. *Computers & Education* 43 (2004) pp. 137–151.

learning activity games such as searching for information or clues, discussing strategies, planning physical movements, striving for goals and explaining outcomes. These activities are the internalization of children's psychological functions processes of perception, attention, sensory-motor-operation and memory for learning stimulation with Talk, Text or Dialogue with the use of technological tools. The child operates these activities with their eyes, hands, brains and speech. These are the activities and learning processes that require observation, attention, memory and hands-on to generate outcomes. Besides, these learning processes are inherent in children's play. They play with the technological tools. Vygotsky argued that in play, children experience two types of situations. One, the child operates with different meaning in a real situation. Second, a child adapts the smallest amount of conflict – play gives children the chance to learn the greatest conflict by following the rules. When children play, it is as if children are transferred to a new world. However, children also play by following the rules and fulfilling their desires[500].

Therefore, Vygotsky's argument on play provides the evidence for these types of learning. Learning and play experience fulfil children's desires. These activities reflect Vygotsky's statements that play is considered a leading activity that determines the child's development (Cole, et al., 1978)[501]. These approaches, I contend, would allow Malaysian children to explore, learn and play with technological devices. These activities give a broader background for changes in needs and consciousness, as Vygotsky argued[502] that children create an imaginative sphere with voluntary intentions while playing. In conclusion, the Dialogic Framework approaches give children voluntary intentions, future plans and desirable motives with the imagination of the roles that they play during learning. Therefore, with these approaches, Malaysian children have the abilities to become independent, self-confident and learned individuals.

Accountable and mindful behaviour

[500] Ibid. pp. 101-103.
[501] Ibid. pp. 101-103.
[502] Ibid. pp. 102.

Piaget's theory of children's speech and action and Vygotsky's theories of children's speech and play echo throughout this framework. So, the approaches widen children's critical thinking through the use of language for learning, cognitive development and shared knowledge. These educational attainments are developed through the stimulation of the technological tools with teacher's help and the internalization of their psychological functions. These processes give children's learning enjoyment. They are therefore, free from immediate constraint when they Talk or play because they are in charge and in control of the gadgets. The Dialogic Framework activities allow children's physical and psychological functions to develop learning achievements.

The framework instils children's accountalibility and mindfulness of responsibilities in learning. Thus, children proceed for informal experiences with personalised activities. The children are exposed with social interactions during their engagement with the activities, they Talk, exchange of opinions and learn with each other. They are exposed with Internet resources, technological tools and learning materials at hand. The resources are made available to them with the Internet Google search engines, Wikipedia, online free dictionary and e-learning portals. The framework teaches children responsibility in producing learning activities. This type of exposure reflects Vygotsky's theory of social interaction and the use of symbolic tools from social culture. This means, the resources are made available to these children to utilise. The symbolic tool means: sense-making, participation in cultural life, using artefacts, using technologies and joining in ritual activity with others[503]. To conclude, this framework cultivates active and mindful children that share in the spirit of learning with technological devices.

[503] Cole, M. John-Steiner, V. Scribner, S. and Souberman, E. 1978. *Editors' Preface, L. S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press; London, England.

Conclusion

This framework provides many potential educational benefits for Malaysian children. The approach brings content-based resources that have a profound effect on how learning is applied, assimilated and remembered by children. Moreover, this approach utilises Talk or Dialogue, engagement, relationship, participation, thinking, problem solving, activity tasks, games, play, shared-knowledge etc. between children and children, and children and adults. These processes are particularly valuable for children in their learning accomplishments. Talk is a child's agent for self-development and problem solving in society. Finally with the Dialogic Framework approach, Malaysian children are nurtured as intellectually equipped individuals. In addition, learning can become more effective when children can converse with each other in a scholarly way, interrogating and sharing their descriptions of the world.

Chapter 5

The Theoretical Discussion

Introduction

This chapter highlights the theoretical relationships between children's speech and Talk or Dialogue for learning, that are linked to Vygotsky's theories. His theories are linked to many other neo-Vygotskian concepts that have been embraced by this study. Concepts such as children's speech through the use of social tools, social interactions and the ZPD are mentioned significantly in this study, for the construction of the Dialogic Framework. These relationships are emphasised in this study to demonstrate the significant associations between children's speech development, children's cognitive expansion and the pedagogic inferences. Many neo-Vygotskians such as Goswami and Bryant (2007), Bruner (1996), Weinreich Haste (1987) and others, value Vygotsky's theory of speech in children's cognitive growth. As a result, this chapter explains the links between Vygotsky, and Vygotskian scholars who adopted those theories of children's cognitive development, and the ZPD concept of speech, to sustain this study's contribution to knowledge. The theoretical discourse about these links maintain this study's Dialogic framework discussed earlier. The framework brings together the Talk approach with the use of technological devices for children's learning attainment. Malaysian teachers are poor in educating children with Talk. In the classroom, the approach of teaching and learning are conventional and boring. Children are too scared to voice opinions. In academic research, there is no discussion on the Talk or Dialogue approach to teaching and learning[504]. In this chapter, we will understand further how the function the technological tools and signs are commonly linked to children's Talk. Ultimately, this study hopes to show how Talk or Dialogue is distinct in a child's social, intellectual and cultural development.

[504] Zakaria, E. and Iksan, Z., 2007. Promoting Cooperative Learning in Science and Mathematics Education: A Malaysian Perspective, *Eurasia Journal of Mathematics, Science & Technology Education, 2007, 3 (1),* pp. 35-39.

Section 1 - The relationships between the theories in the Dialogic Framework for scrutiny

The relationships between the theories in the Dialogic Framework for scrutiny

Introduction

The previous section shows the linkages between the four characteristics of the educational theories in the Dialogic Framework on various aspects of children's speech and intellectual development. The linkages indicate the development of children's behaviour through the use of the Interactive technological devices with a variety of the Internet resources. The use of Google search engines for example can help children to search for information. The Wikipedia allows for the understanding of new words or meanings, the online free dictionary provides idioms, phrases, and sayings. The e-learning portals provide knowledge, data, understanding and many more. Children are being exposed with knowledge and resources; they can Talk or Dialogue between them to discuss findings, copy and paste for their homework and engage in learning activities with their teachers. These activities promote knowledge exchanges and solving learning problems. These links highlight the connection of the children's learning to the use of Talk and the technological tools. Accordingly, this section highlights the three most important relationships between the theories in the Dialogic Framework to be scrutinised. Namely: Dialogue and the use of social tools, social interactions and the ZPD concepts.

Dialogue and the use of social tools

The Dialogic Framework acknowledges that Talk or Dialogue consists of chat discussion, texting and instant messaging both inside and outside the classroom with the use of technological tools. Dialogue may be found in these media but how does Dialogue for learning function, specifically for Malaysian children? The Dialogic Framework emphasises the practices of Talk or Dialogue for learning accomplishment alone or collaboratively with others. The approaches anticipate that teacher and children Talk inside or outside the classroom in a scholarly manner so that children imitate the Talk with others after school hours. The approaches emphasise the use of technological devices for teaching and learning during group

interactions, discussions and solving learning problems. All these activities promote conscious and healthy engagement between teachers and children.

The use of Dialogue in the approaches illustrates what was termed intermental and intramental psychological processes by Vygotsky. He argues that a child's speech is so important that the child achieves goals only by using speech[505]. At the same time, the child solves their problems as their speech reacts to their psychological functions and social interactions. So, the Dialogic Framework highlights the use of tools and Dialogue as part and parcel of the child's learning experiences and shared knowledge. Talk is the intermental and intramental psychological processes in children because through Talk, children gain knowledge and achieve goals in learning as Vygotsky argued. This reflects the cognitive distributed theory, the attainment of learning through various existing encounters (Salomon, 1997)[506]. The use of Talk is socialised speech and the contexts are the learning processes that situate the content (Rogoff, 1990)[507]. Therefore, Malaysian children Talk, operate the devices and respond within their own mental capability and share with others. This means children are allowed to practise learning problems with the use of technological devices together with friends and teacher's help. Vygotsky argues that the use of social tools is fundamental in children's development not only because it helps them relate more effectively to their external environment, but also helps their internal intellectual development[508]. The Talking and learning approach with the use of technological devices is fundamental for children's cognitive development which ultimately educates them for social involvements in the society. As Vygotsky argues, social interactions and the use of social tools are interpersonal development. Thus, with these relationships, Talk is the mediator that transforms thinking into an intrapersonal process[509]. This statement implies that a child solves a task by using speech and includes the social tools near them. Having that said, the Dialogic Framework imparts children's learning by solving problems with Talk or

[505] Cole, M., John-Steiner, V., Scribner, S. and Souberman, E.,1978. *L.S. Vygotsky, Mind in Society: the development of higher psychological processes*, Cambridge MA: Harvard University Press.
[506] Salomon, G. 1997. *Distributed Cognitions: Psychological and Educational Considerations*, Cambridge University Press.
[507] Rogoff, B., 1990. *Apprenticeship in Thinking: Cognitive Development in Social Context*, Oxford: Oxford University Press.
[508] Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., 1978. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press. pp. 57.
[509] Ibid. pp. 57.

Dialogue and technological devices available practically. Vygotsky argued that children take and apply the tools around them, use their perception, and create specific plans to achieve better solutions[510]. The approaches stress children's psychological functions of perception, attention, sensory motor-operations and memory with the technological devices to create learning plans. These actions are distributed cognition - the exploration of education for knowledge sharing with the technological tools inside and outside the classroom context. Therefore, the approach allows for children's socialization in learning. The children's Talk and socialization for learning reflect the notion of children's speech by Piaget. Piaget asserts that children's cognition, action and language are developed simultaneously for their action. Piaget argues that cognitive development is the major part of human growth and language is dependent on cognitive development. Piaget asserts: "Through talking, children developed an ability to think abstractly and make rational judgments about the concrete or observable phenomenon"[511]. That said, the theory's relationship of the Talk and the use of social tools are prime. This Framework is a complete framework of children's intellectual development. The approaches allow children to place action and produce a reaction. Besides Vygotsky, Piaget, Salomon and Rogoff, and Bruner, (1985) argue that there are associations between a person and a situation; the cognitive processes do not exist exclusively in one's brain[512]. In relating Bruner's statement to the Dialogic Framework approaches, I contend, these approaches show that children's intellectual development is not in their mind alone, but involves the group members, the teacher and the contextual relationship to something. Bruner wrote: *"Children, like adults, are seen as constructing a model of the world to aid them in construing their experience. Pedagogy is to help the child understand better, more influential, less one-sidedly"*[513]. As a result, the approaches unite teacher and children through Talk, these minds incorporated as one, for learning. The Dialogic Framework brings minds and technological devices together. Hence, this unity will construct a model of the learning experience together. The evidence made by Purcell,

[510] Ibid. pp. 20-30.
[511] Ibid. pp. 1-28.
[512] Bruner, J. S., 1985. *'Vygotsky: a historical and conceptual perspective'*, in J.V. Wertsch (ed.) 1985.*Culture, Communication and Cognition: Vygotskian Perspective,* Cambridge: Cambridge University Press.
[513] Bruner, J. S., 1996. *The culture of education*, Cambridge MA: Harvard University Press.

et al. (2013) on the use of technological devices and tools in helping students' learning has shown the benefits to teachers and learners[514]. This, Purcell, et al. argue, is in part, increasing the level of children's motivation while learning.

Dialogue and the Zone of Proximal Development (ZPD)

The Dialogic framework approaches maintain the ZPD concept which stresses the teacher's role in providing continuous guidance to children. The teacher educates children in ways of conversing, submitting to the consensus, discussing possible outcomes together and voicing differing opinions in the classroom. Thus, these qualities will remain in children's cognitive development even outside the classroom. The teachers claim that they use digital tools for students' research. Furthermore, the assessment and the submission are being conducted online.

The ZPD concept provides opportunities for children through linguistic opportunities and encounters that the teacher provides. Vygotsky asserts that the construction of knowledge and understanding is a natural social activity, not just mainly based on direct interpretations of the physical world. Thus, the child is mediated by the society that he or she is growing up in[515]. The Dialogic Framework nurtures in Malaysian children the basic construction of knowledge and understanding through Talk that needs adults help. Children will not learn just by listening to the teacher's lecture, but by discussion and raising questions with their teacher's support. Mercer and Littleton argue that their program –Thinking Together - showed that children contribute and achieve more knowledge together; they also have the opportunity to learn and practice better ways of communication. They are mutually working together. These findings are reported in detail in Mercer and Wegerif, Mercer, et al. (Mercer, Wegerif and Dawes, 1999)[516]. The approach underlines social influences on the deeper meaning of guidance and support by the teacher and parents. Mercer and Littleton (2007) wrote: *"A child's cognitive capabilities*

[514] Purcell, K., Heaps, A., Buchanan, J. and Friedrich. L., 2013. How Teachers are using technology at home and their classrooms. National writing project, College Board and Pew Research Center. http://pewinternet.org/Reports/2013/Teachers-and-technology.
[515] Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., 1978. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press; London, England.
[516] Mercer, N., Wegerif, R. and Dawes, L. 1999. 'Children's talk and the development of reasoning in the classroom', *British Educational Research Journal* 25 (1): pp. 95-111.

can be defined in terms of what they can achieve unaided when faced with a task or problem... But, individuals may also differ in terms of what they can achieve, or what they can understand with help within the ZPD as Vygotsky put it"[517]. Mercer and Littleton argue that most assessment measures what individuals can do without help. But individuals differ in how they achieve. The Dialogic Framework approaches are crucial to Malaysian children in order to nurture a new generation that are intellectual, educated in discourse, and caring individuals. These children will be the future teachers, parents, academicians or intellectuals that educate future world children to Talk with the ZPD concept.

The social interaction

The notions of children's developmental theory by Vygotsky highlight the social interaction. In his writing, he questions how as human beings, we actively realise and change ourselves in the varied context of culture and history. Vygotsky argued that humans, while being able to internalise cognition, also have the ability to externalise the learning processes and share with others. This includes his or her understanding of shared experiences. Vygotsky asserts that the process of interaction between the child and others is the foundation for their future endeavours. The Dialogic Framework approaches are the learning process of social interaction between the teachers and children. The approaches allow discussion, interaction and arguments between teachers and children which promote the psychological intermental (interpersonal) process. Then, children internalise these processes for their psychological intramental (intrapersonal) reflections and logical reasoning. As a result, learning and development are seen as both interpersonal and intrapersonal processes mediated by the Interactive technological tools. A child's cognitive learning is developed during joint activities. The Dialogic Framework approaches emphasise the need for engagement and involvement between children and teachers in creating the "enculturation" of Dialogue and learning while inside and outside the classroom. The engagement between children and teachers and the use of technological devices in schools

[517] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children's Thinking, A Sociocultural Approach,*Routledge: London.

can lead to children's logical reasoning and reflection outside the schools and society. Research shows that when teachers and students conduct online activities such as assessment and submission, Wikis, blogs, or Facebook, Purcell, et al. argue that these in part, increase the level of children's motivation while learning[518]. Research has found that the relational closeness between teacher and children, and children and children is associated with the sharing of ideas, exchanging points of view and a collective approach to challenging tasks. These highlight the Distributed Cognition theory. Howes and Ritchie (2002) and Underwood and Underwood (1999) argue that close relationships, characterised by a sense of trust and mutuality, enhanced learning.

[518] Purcell, K., Heaps, A., Buchanan, J. and Friedrich, L., 2013. *How Teachers are using technology at home and their classrooms.* National writing project, College Board and Pew Research Center. http://pewinternet.org/Reports/2013/Teachers-and-technology.

Sec II - The Dialogic Framework is linked by a connection to Vygotsky's ideas

The Dialogic Framework is linked by a connection to Vygotsky's ideas

The Dialogic Framework linked together ideas of speech, children's intellectual learning development and the use of social tools, from Vygotsky, (1930)[519]. Goswami, and Bryant (2007), Jerome Bruner and Weinreich Haste (1987), and Vygotsky (1930) argue that children's cognitive development requires engagement of Talk with adults, peers and the wider culture[520]. This framework positioned together Vygotsky and Vygotskian scholars who adopted the theory of children's cognitive development and the ZPD concept with speech. The framework evaluates scholars such as J. Piaget, J. Bruner, M. Bakhtin, Goswami and Bryant, D. Wood and G. Ross, who highlight children's speech and their social interaction for learning. The framework recognises the role of adults, parents and teachers for children's learning as the same as the concept of scaffolding proposed by Bruner, Wood and Ross (1976). These scholars highlight the role of adults, parents and teachers in guiding children's intellectual development through the use of speech[521]. The framework implements a sociocultural approach to teaching and learning, the same as many other scholars; Dawes, Wegerif, Barnes, Todd, Mercer and Littleton. In 2007, Mercer and Littleton embraced Vygotsky's idea of children's speech and the sociocultural approach of classrooms' Dialogue learning. They wrote about teaching and learning dialogue approaches in Britain's classrooms[522]. Earlier than that, in 2004 Mercer formulated the Thinking Together teaching and learning approach in the British classroom. This approach focuses on children's sociocultural learning through Dialogue in the classrooms with teachers' guidance and engagement. Mercer and Littleton maintain Vygotsky's theory of the ZPD concept and children's speech that develops a child's educational accomplishment.

[519] Vygotsky, L. S., 1930. *"Tool and Sign"* private archives of L.S. Vygotsky. Manuscript.
[520] Goswami, U. and Bryant, P., 2007. *Primary Research Survey 2/1a, Children's Cognitive Development & Learning*, Copyright © University of Cambridge; Vygotsky, L.S., 1962. *Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press; Bruner, J. S., and Weinreich-Haste, H., 1987. *Making sense: The child's construction of the world***,** pp. 21.
[521] Wood, D., Bruner, J. S. and Ross, G., 1976. The role of tutoring in problem-solving, *Journal of Child Psychology and Child Psychiatry*, 17: pp. 89-100.
[522] Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children's Thinking, A Sociocultural Approach*, Routledge: London.

In 1981, Alexander highlighted the Dialogic teaching approach in the classroom. He emphasises the use of Talk in classrooms between teacher and children. Alexander mentioned Vygotsky and Piaget's idea of cognitive learning by social interaction. He applied Vygotsky's idea of teacher's Talk and the ZPD concepts, social interaction and cognitive learning[523] for his Dialogic teaching in British classrooms. Alexander articulates the Dialogic Teaching as an important pedagogical approach with the ZPD concept based on the evidence that Talk provides advantages to children's learning. He reasons that British classroom teaching lacks Talk with children, a lesson in the classroom is dominated by writing. Alexander argues that Talk and social interaction are two critical points that develop children's understanding and learning accomplishment. Hence, with the Dialogic teaching approach in the classroom, children develop their very identity and sense of self and worth (Alexander, 2008)[524].

The theory of social interaction and the use of speech for children's intellectual learning relate to the Distributed Cognition (Salomon, 1997). The Dialogic Framework allows for the Distributed Cognition or shared knowledge through children's learning experiences. These experiences are the results of what children have gained everyday such as: what is said or not said, eye contacts, the people's expression, the technological functions etc. These experiences reflect Vygotsky's concepts of speech and social interaction for children's psychological function processes. Vygotsky claims that children's higher psychological functions such as perception, attention, sensory-motor operations and memory help children's intellectual development[525]. Vygotsky emphasises how human beings change themselves in the varied context of culture and history with speech, social interaction and the use of social tools. So the Dialogic Framework argues that these processes are internalised in children's intellectual development through the teacher's help and guidance. Vygotsky (1930) [526], and Simon, J. (1963, 1987) argue that ZPD is the gap between a child's existing knowledge and ways of

[523] Alexander, R. J., 2004. *Towards Dialogic Teaching: Rethinking Classroom Talk,* Cambridge: Dialogos.
[524] Alexander R. J., 2008. *Towards Dialogic Teaching: Rethinking Classroom Talk,* Fourth edition. pp.11.
[525] Rogoff, B., 1990. *Apprenticeship in Thinking: Cognitive Development in Social Context,* Oxford: Oxford University Press.
[526] Vygotsky, L. S., 1962. *Thought and Language,* Cambridge, MA: MIT Press.

solving problems or understanding unaided which can be achieved only with the guidance of the teacher or a 'more capable peer'[527].

Therefore, in 1962, after Vygotsky's work was edited and re-published; scholars claim that Vygotsky's theories of children's speech and intellectual development are widely used by many scholars. His theory embodies certain ways of representing ideas and learning to children[528]. Vygotsky's notion of children's speech and cognitive learning theory has been re-examined for cognitive psychology and information processing related fields. His theory is referred to by scholars in the information technology, psychology, and social sciences educational related fields. His theory of children's speech sparks the Dialogic Framework arguments over the use of Talk or Dialogue, the technological devices and tools, intellectual learning development and children's psychological functions.

The Dialogic Framework accentuates the Talk or dialogue with the use of the Interactive technological devices and tools such as the social networking sites, e-learning, SMS and chat with children. The Talk or the communication in the digital age is growing rapidly and challenging the communication technology over children's learning in the classroom. A child's intellectual learning achievement is diversified through Talk or Dialogue with technological tools, mobile phones, tablets and laptops. Therefore, The Dialogic Framework distinguishes Vygotsky's statements about children's speech for cognitive development. Vygotsky's notions of children's speech and cognitive development provide understanding of children's Talk with the use of the Interactive technological devices and the Internet tools throughout their daily lives. Hence, these phenomena have brought interesting questions about children's Talk with the use of technological tools to a new research exposure in children's learning attainments.

In 2000, Laurillard, Mercer, Wegerif, Dawes, and Littleton embrace the notion of Speech or Talk as a modus operandi of teaching and learning in the classroom. Remarkably, scholars' arguments are in-line in claiming that Talk or conversation with social interaction and ZPD develop children's learning. The only thing lacking is the examination on Talk and children's

[527] Simon J., 1963. Vygotsky and the Vygotskian's, *American Journal of Education*, Simon, B. and Simon, J., 1987. (ed) *Educational Psychology in the U.S.S.R.* London: Routledge. pp. 21-34.
[528]Mercer, N. and Littleton, K., 2007. *Dialogue and the Development of Children's Thinking, a Sociocultural Approach*, Routledge, London and New York.

psychological functions of their perception, attention, sensory-motor operations and memory in their learning development. How does the use of Talk and the technological tools perform these functions inside and outside classrooms? In this particular area the Dialogic Framework will contribute. For that reason, the Dialogic Framework fills the gaps. The Dialogic Framework concerns children's Talk or Dialogue in the classroom which underpins their social interaction and their development of the psychological functions. The importance of Talk or Dialogue is becoming wider with the use of the Interactive technological devices and Internet tools, and the ZPD concept of teacher's guidance inside and outside the classroom. The notions of children's speech, their social interaction with the use of technological devices and tools and the ZPD concept are intertwined significantly. The Dialogic Framework advocates Vygotsky's theories; the relationship of social interaction in the society, the use of social tools, the ZPD and the play in children's learning attainments. Thus, humans internalise the shared experience with their family, school, social group and the community where they grow-up. During these processes, human cognition has the capacity to externalise and internalise their own activities with speech and social tools. Vygotsky argues that the process is called the sign-operations activity. The sign operations activity is the stimulus and response which relates to the use of social tools and speeches, writing, talking, playing or crafting. At this juncture, the Dialogic Framework anticipates the children's higher psychological functions of perception, attention, sensory motor-operations and memory in children's learning achievement with the technological devices. With that, the Dialogic Framework formulates the teaching and learning approaches based on Vygotsky's theories of children's learning development. The framework envisages the relationship of these theories; social interaction, social speech, the ZPD, play and the use of social tools to children's intellectual triumph. The Interactive technological devices and tools represent the social tools in the 21st century's culture. These tools are easy to reach gadgets for children. Purcell, et al.'s (2013) findings showed a wide variety of digital tools have been used by students: e.g. mobile phones, tablets and e-book readers and laptops and desktop are common[529]. Price and Rogers (2004) research shows that the digital devices allow five key

[529] Purcell, K., Heaps, A., Buchanan, J. and Friedrich, L., 2013. *How Teachers are using technology at home and*

areas in children's learning development and exploit interaction capabilities. Their research argues that digitally augmented physical spaces promote children's learning through children's engagement with the devices[530]. Scholars claim that the technological tools stimulate children's learning. Bell (2002) claims that Smart Boards are technological devices that maximise their usage to everyone in a classroom, a beneficial tool that inspires creativity and critical thinking with a camera that can document and video the activities[531]. Vygotsky claimed that the use of social tools or any artificial means by children is a transition operation in children's cognitive development[532].

With this evidence, the Dialogic Framework provides a livelier learning inside and outside the classroom approach through Talk, activities and the use of tools for teacher and children. The approaches allow for more multimedia resources, connection with the Internet, and classwork with the tools. The arguments in this study sustain the Dialogic Framework approaches for a Talk or Dialogue between teacher and children with the use of the technological tools in developing children's intellectual thinking. The framework recognises Vygotsky's theory of the stimulus and response relation with the use of Talk. Talk or Dialogue between teacher and children through the use of Interactive technological devices internalise children's intermental and intramental processes[533]. Vygotsky asserts that the intermental level is the process of Talk, social interaction or learning between the child and others. These processes then become the basis for the child's future actions. Their actions such as discussion, interaction and argument are then internalised as the basis for their intramental (inside the child) reflection, logical reasoning and solving problems. These processes of educational gains in children oblige to the context and meaning of what they learned.

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their classrooms. National writing project, College Board and Pew Research Center. http://pewinternet.org/Reports/2013/Teachers-and-technology.

[530] Price, S. and Rogers, Y., 2004. Let's Get Physical: The learning benefits of interacting in digitally augmented physical spaces. *Computers & Education* 43 (2004) pp. 137–151.

[531] Bell, M. A., 2002. Why use the Interactive White Board? A Baber's Dosen Reasons. Teachers. *Net Gazette, 3(1).* Retrieved from Berson, M. J., 1996. Effectiveness of computer technology in the social studies: A review of the literature. *Journal of Research on Computer in Education, 28 (4)*: pp. 486-499.

[532] Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., 1978. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes, Afterword.* Cambridge MA: Harvard University Press; London, England. pp. 55.

[533] Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., 1978. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes, Afterword.* Cambridge MA: Harvard University Press; London, England.

The conclusion

The Dialogic Framework builds on the very sound foundations of Vygotsky's theory of children's speech for their educational attainment as well as the work of many other scholars i.e. Piaget, Wood, et al., Tharp and Gallimore, Wells, Bakhtin, Daniels, Bruner, Rogoff, Laurillard, Lave and Wenger, etc. Lave and Wenger (1991) put an emphasis on learning as a social process of situated cognition that also builds on Vygotsky's idea of social interactions[534]. Situated cognition explains that children absorb from experiencing the learning by participating in the educational activities and the use of technological devices. Rogoff, (1990) stresses the socialised speech as situated learning which sustains a concept of learning is a social activity which derives from social interaction and connection. The situated learning denotes the importance of learning context which gives meaning to the learner. Situated cognition theory reflects Vygotsky ideas that learning is a profoundly social process. Vygotsky stresses the importance of teaching approaches such as the use of Talk and the ZPD concept that would make learners grasp the content of learning effectiveness. The content of learning includes intellectual analysis, comparison, unification and establishment of logical relations. Thus, learners are able to reason, explain and reproduce new things[535]. As a result, this thesis brings together Vygotskian ideas of Talk and the development of children's cognitive learning through social interactions and the use of social tools for the Malaysian classroom. The Dialogic Framework is a framework of children's intellectual accomplishments that emphasises children's psychological functions of perception, attention, sensory motor-operations and memory and is sustained by Vygotsky's theory. These functions are for children's learning attainment with the use of the Interactive technological devices and tools, the use of Talk or Dialogue approaches of teaching and learning and the ZPD concept.

In the home learning context, the parents are not aware of Talk approaches either. Thus, teachers, parents, and scholars have not recognised or made use of the significance of Talk with

[534] Lave, J. and Wenger, E., 1991. *Situated learning: Legitimate Peripheral Participation*. New York: Cambridge University Press.

[535] Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., 1978. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes, Afterword.* Cambridge MA: Harvard University Press; London, England. Originally from Leontiev, A. N. and Luria, A.R., 1968. *"The Psychological Ideas of L.S. Vygotsky"* in Wolman, B.B., ed., *Historical Roots of Contemporary Psychology*, New York: Harper and Row. pp. 338-367.

ZPD concept. I contend, we are still poor at using speech as a methodology in developing classroom or home based learning. Our children are passive learners, they were taught based on lecture-based instruction and teacher centered instruction[536]. They seldom ask questions and prefer to be quiet. So, the contribution of this thesis is to show the education department the Dialogic Framework approaches for nurturing Malaysian future children to becoming active, independent and respected learners.

[536] Ibid. pp. 35-39.

Sec III - The explanation of the difference between Vygotsky's stimulus-response relations and this study's theorization, which extends the Dialogic Framework

The explanation of the difference between Vygotsky's stimulus-response relations and this study's theorization, which extends the Dialogic Framework

In line with Vygotsky's theory, this section examines the behavioural role of the sign or the sign-operations activity theory. In this study, this theory explains the use of Interactive technological devices/tools in children. In other words, this section explains how the function of the technological tools and signs are commonly linked to children's Talk. Thus, how Talk is distinct in a child's social and cultural development. This section highlights children's Talk or text, interaction and how the use of Interactive technological devices help their intellectual development. Vygotsky argues that Talk develops children's social interaction, social-cultural learning, the use of social tools and cognitive development. Vygotsky highlights the speech with children's higher psychological functions and the stimulus and response relationship using social tools[537].

Vygotsky describes that a stimulus and response relation is an action that originally signifies an outside activity is reconstructed internally inside a child. This implies the use of the interactive technological devices and tools in this study. Price and Rogers argue that the use of the technological devices activity stimulates children's learning[538]. The Dialogic Framework approaches outlined the use of technological devices in children's learning activities. The approaches put emphasis on children's learning activities with technological tools that develop their higher psychological processes of perception, attention, sensory motor-operations and memory.

The approach is based on Vygotsky's theory that play, social interaction, speech, and writing are the activities that he called the sign operations activities. These activities allow for the transformation of children's practical cleverness, intended attention and memory. An example of this is narrated by Vygotsky in the development of pointing. A child points at something beyond his reach initially and that changes gradually with a mother or father's help.

[537] Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., 1978. *L.S. Vygotsky, Mind in Society: the development of higher psychological processes*, Cambridge MA: Harvard University Press; London, England.
[538] Price, S. and Rogers, Y. 2004. Let's Get Physical: The learning benefits of interacting in digitally augmented physical spaces. *Computers & Education* 43, pp. 137–151.

By the time the child can grasp what he or she wants, he or she begins to understand the pointing movement. At this juncture, children point at another person as a means of establishing relations; from an object-orientated movement it becomes a movement aimed at another person. Thus, pointing is a true gesture that happens and is understood by those around the child[539].

Secondly, Vygotsky also explained that a stimulus and response relation is an interpersonal development that is transformed into an intrapersonal process. In relation to this research, a stimulus and response relation is happening in a child's interpersonal development (which is their social interaction with teachers, other children, or parents) and transformed into an intrapersonal processes of learning reasoning and solving problems. In Vygotsky's words, this describes two phases of a child's cultural development, one on the social level, and the other on the individual level. Being precise, the stimulus and response relation is the relationship between people initially (inter-psychological), and then within the child (intra-psychological). This includes voluntary attention to logical memory and to the formation of concepts. All the higher functions originate as actual relationships between human individuals[540]. That means, Vygotsky explains, that the internalization processes of perception, attention and so on happened after a series of individual to individual social relations. Similarly, Vygotsky describes the transformation of an interpersonal process into an intrapersonal one is the result of a long series of developmental events.

Vygotsky termed speech, writing or using number systems as "sign-operation activity". Vygotsky explains that children's speech is one form of sign-operation. These activities; speech, writing or using number systems are the "intermediary links" between the children and social tools. Vygotsky asserts that the intermediary link is a second order stimulus that is drawn into operation where it fulfils a special function. It creates a new relationship between the child

[539] Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., 1978. *L.S. Vygotsky, Mind in Society: the development of higher psychological processes*, Cambridge MA: Harvard University Press; London, England. pp.57.
[540] Ibid. pp. 57.

(the initiator) and social tools (response). Vygotsky named these processes as the stimulus and response relation of sign-operations activity[541].

According to John-Steiner and Souberman, editors of the book; *L.S. Vygotsky Mind in Society: the Development of Higher Psychological Processes,* Vygotsky discussed the stimulus and response relation. They said:

> *"A crucial aspect of human mastery, beginning in infancy, is the creation and use of auxiliary or 'artificial' stimuli; through such stimuli an immediate situation and the reaction linked to it are altered by the active human intervention. These auxiliary stimuli created by humans have no inherent relation to the existing situation; rather, humans introduce them as a means of active participation"*[542].
>
> (John-Steiner and Souberman, Afterword, 1978)

The use of artificial stimuli by humans progresses in stages from infancy, using social tools; operating and linking them according to their needs. Humans apply social tools to solve problems and achieve tasks. Then, depending on their own interests, they are able to alter those tools. The writers described Vygotsky's views on auxiliary/artificial/secondary stimuli as highly varied. For example, there was the language of the people close to a child, their own achievements, the use of his/her own body and the tools of the culture that the child is born into. Vygotsky puts play as one of the most important examples. He describes the play activity of poor children who do not have access to manufactured toys but are able to play house, train and so on irrespective of the resources available to them[543]. These processes change the psychological structure of the human memory process. Based on Vygotsky's argument, this study relates the sign operation activity to the use of the technological devices in children. Children use technological devices by operating the devices, they talk, text or chat and engage in classroom activities. Thus, children operate the tools they have such as the Internet technologies and so on for their learning attainment. In the approaches that the Dialogic Framework proposes, the two approaches emphasise child interaction with the technological

[541] Ibid. pp. 38-51.
[542] Ibid. pp. 123.
[543] Ibid. pp. 123.

devices and Internet tools for finishing their school tasks, they play with the devices for solving the problems of their lesson i.e. Talk, write, chat in the social network, create their own Blogs, put pictures, upload music etc. for learning.

Figure 4

(This figure was illustrated by Vygotsky and documented by Cole, et al., 1978 [544])

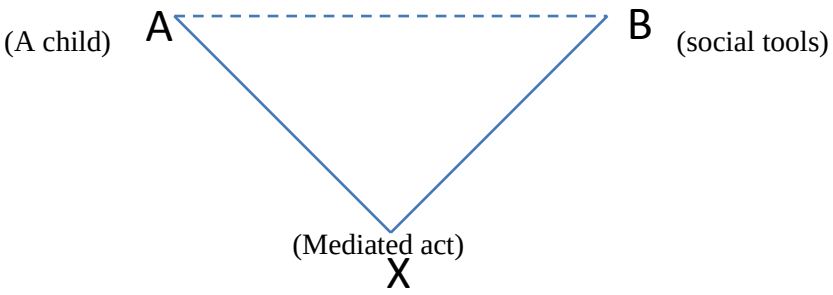


Figure 3 illustrates Vygotsky's Diagram to show the function of A, B and X. X represents human mediated memory/sign-operations/intermediary link/mediated act/2nd order stimulus. The example includes: speech, draw, play with homemade toys or mark a stick as a reminder.

How do the issues described above relate to the process of sign-operations activity in the current day with the use of interactive technological devices; i.e. Mobile phone or IWB?

The diagram of the sign-operations activity reflects the use of technological devices in this study. The diagram above represents the stimulus and response relation between children, Talk and the interactive technological devices. The Talk stimulates children's learning with the use of the technological devices and tools. The approaches brought by the Dialogic Framework underpin the stimulus and response relation between children and Talk with the devices. The Talk is the mediated agent when using the technological devices. The approaches emphasise teachers and children's Talks, for their activities inside and outside classrooms. The activities include discussion, writing, and operating supporting graphics i.e. sound, picture, etc. These activities, I contend, are incorporated into a new culture of the digital age, a new culturally – elaborated organization of children's behaviour. Vygotsky argues that the activities such as

[544] Ibid. pp. 40.

write, talk, draw etc. are a new culturally-elaborated organization of children's behaviour[545]. The learning activity with technological devices i.e. IWB, and Internet tools, represents a new form of action or behaviour that stimulates and responds to children's learning. Vygotsky claims that the sign-operations activity is unique to human beings as the activity signifies a new form of action or behaviour in relation to 'stimulus–response'. Therefore, Vygotsky claims that the creation and use of those artificial stimuli will finally become the immediate cause of human behaviour and activities. The Dialogic Framework approaches show children's learning process stimulated by the technological devices and tools i.e. IWB, Blogs etc. The sign-operations activity resonates with children's Talk, Text or Dialogue with the use of technological devices; children Talk, Text or Dialogue is the intermediary link between children and the technological devices. The technological device is the response-social tool. These processes of sign-operations activity, Vygotsky argues, are the stimulus and response relation between a child and the social tools[546]. As a result, this study argues that a relationship happens between a child, his or her Talk, Text or Dialogue with the use of the technological devices. Vygotsky claimed that children's psychological functions are related to the developmental processes of their interaction with the use of tools, speech and play. The use of social tools and speech are the processes of action and thought that mediate a child in achieving their desired goals. Vygotsky emphasises that human psychological functions include perception, attention, sensory-motor operations and memory; each of which are part of a dynamic system of behaviour in a child[547]. That said, this study relates the human psychological functions to the use of the technological devices that develop intellectual learning.

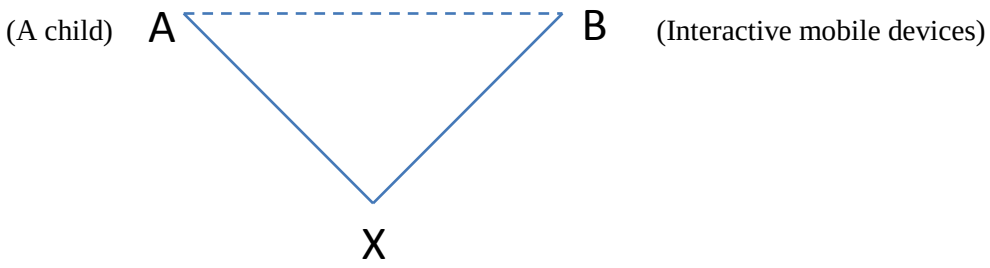
Therefore, the concept of the sign-operations activity reverberates to the concept of this study; children's Talk, Text or Dialogue with the use of the Interactive technological devices. Simply put, firstly, the intermental level describes the interaction between children and teacher or friends. The process shows the transformation in children's intermental level of social contacts with friends, family etc. Text, Talk and Dialogue are the link (the sign-operations

[545] Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., 1978. *L.S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press; London, England.
[546] Ibid. pp. 57.
[547] Ibid. pp. 57.

activity) between the children and the use of tools. Then, the Text, Talk or Dialogue is the sign-operations activity that affects children's psychological functions of perception, attention, sensory-motor operations and memory for action. This level is the intramental psychological processes of humans for inner psychological processing. Therefore, their social interactions are the intermental processes of learning. Subsequently, the inner processes of developing task, action and result are their intramental process. Vygotsky explains that the intramental psychological processes are human's inner psychological processing. Subsequently, the response that humans develop from the use of social tools, social interaction and the learning environment are their intermental processes[548].

Figure 5

Figure 4 shows this study's finding in relation to the sign-operations activity with the use of text, Talk or Dialogue through the technological devices i.e. tablet, mobile phone, IWB etc.



This diagram labels a child as point A, which is the initiator. In this study, the child's Texts, Talk or Dialogue is X. The interactive mobile device is point B – the response. The response is the Interactive mobile technological devices/Internet tools.

The Dialogic Framework demonstrates Vygotsky's theory of the sign-operations activity through Talk, perception, attention, sensory-motor operations and memory with the use of technological tools. Vygotsky claims that speech stimulates children's psychological functions

[548] Ibid, pp. 57.

and response with social tools for learning achievement (1930)[549]. Speech became an important part of the children's reasoning development. Consecutively, at the next stage of children's development, their speeches develop to achieve a more difficult form of cognitive perception[550]. This explains how children go on developing speech that stimulates learning processes and produces results.

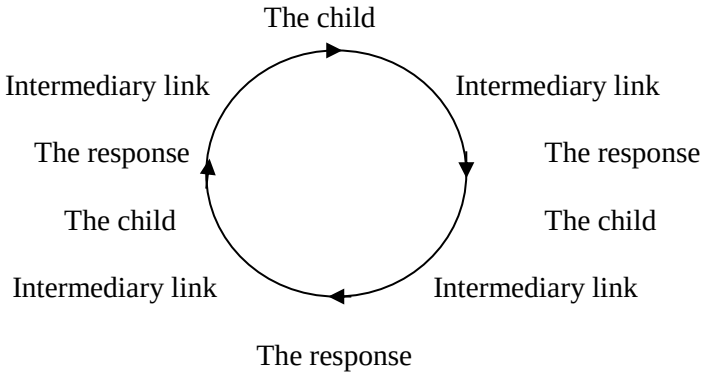
The revelation of this study is the link between the children and the use of technological devices through Talk, Text or Dialogue that is continuously generated in a circular mode. The technological devices are: a notebook, a laptop, an iPad, etc. The mobile phones are: smart phones that support a wide variety of other services such as text messaging, with functions such as MMS, email, Internet access, short range wireless communication i.e. infrared, Bluetooth, 3G, 4G etc. Gaming gadgets include handheld devices that may display video games. This study argues that these technological devices provide a stimulus-response relation to children in back and forth modes that continuously circulate reactions. The revelation of this study is the link between the children and the use of technological devices through Talk, Text or Dialogue that is continuously generated in circular modes. The Dialogic Framework allows the stimulus and response relations that continuously circulate reactions as shown in the diagram below.

Figure 6

This study's theorization extends Vygotsky's model of the stimulus and response relation as circulating reactions:
The child → the intermediary link (text/talk/dialogue) → the response (interactive technological devices and tools)

[549] Vygotsky, L.S., 1960. *The History of the Development of Higher Psychological Functions.* In Development of Higher Psychological Functions. pp.13-223. Moscow: Academy of Pedagogical Sciences, RSFSR, edited by Cole, M., John-Steiner, V., Scribner, S. and Souberman, E., 1978. *Editors' Preface, L. S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press; London, England.
[550] Vygotsky, L. S., 1960. *The History of the Development of Higher Psychological Functions.* In Development of Higher Psychological Functions, pp. 13-223. Moscow: Academy of Pedagogical Sciences, RSFSR, edited by Cole, M., John-Steiner, V., Scribner, S. and Souberman, E. (1978) *Editors' Preface, L. S. Vygotsky, Mind in Society: the Development of Higher Psychological Processes*, Cambridge MA: Harvard University Press; London, England.

The circulating reactions



Conclusion

The summary and suggestion for the future research

This study contributes a Talk or Dialogue teaching and learning approach framework for the Malaysian education system. The study sets out two unique approaches to teaching and learning in Malaysian schools. These approaches provides a substantial amount of knowledge improvement in teaching and learning achievements for the Malaysian children. Ultimately, this study will nurture a future new generation of young people that are intellectual, confident, educated and competent with Dialogue or Talk and the use of technological devices and internet tools. This study provides the intellectual tools to enable the development of Malaysian Education for caring and responsible individuals. These initiatives must be supported by the Ministry of Education, schools and academicians. Thus, it is educational departments that have the authority to give priority to this proposal to be implemented in Malaysian schools for the benefit of Malaysian children.

This study hopes for continuous efforts from academicians to examine Talk or Dialogue with technological devices and internet tools, be it for adult or toddlers, on topics related to human psychological functions, perception, attention, sensory-motor-operations, memory, speech and play in future research. These studies could be focussed on the psychological development of learning and interactive technological device interface design. Interface design is user-generated content that is shared. Research in this area should be concentrated on the user-friendly designs that allow collaboration work on-line, social connections, emotion and communication interest. Hence, the studies should be focused on understandings people's needs, i.e., learners' preferences, likings, techniques and their different requirements for learning and support. This is recommended for psychological learning development with the use of mobile devices for mobile learning.

In preparing for the implementation of this approach in the classroom, it is wise to remember that a pilot study must be carried out properly by the school, the local authority, the academician and the researcher, with expertise in technological devices. This study suggests practical training be conducted for teachers and children ahead of implementation schedules in

Malaysia classrooms. This practical training can be done in many phases according to the implementation project's schedule. Briefly, training should be conducted as closely as possible to the framework outlines. Separate training should be allocated to classify the use of technological devices and internet tools for teachers and children. Then, a pilot study must be carried-out for a few months in the identified areas of schools, for children age 10-15 or so. The government of Malaysia should provide local educational grants for local Universities or academicians to take part.

The government of Malaysia should comprehend the Dialogic Framework as a new approach to teaching and learning which places emphasis on the development of children's cognitive learning. Children will apply critical thinking skills to Talk and evaluate outcomes. In five years, Malaysian children are confident to independently voice opinions, solve learning problems and produce significant learning outcomes inside or outside classrooms. Hence, with the immediate implementations of this framework, this thesis hopes to see Malaysian children outshine within the near future. As a result, Malaysian children's performance on the Trends in International Mathematics and Science Study (TIMSS) and the Programme for International Student Assessment (PISA) will excel to the top five among the Asian countries; Singapore, Thailand, China, India, Taiwan. Therefore, this framework is to be considered for the implementation in Malaysian schools as soon as possible. The implementation is timely for the coming phase of the transformation in the educational system as stated in the Blueprint 2013-2025.

The government has overlooked the importance of the use of Talk or Dialogue in the classroom[551]. The most important area to stress is the interaction between teacher and children in delivering the teaching and learning through the Dialogic Framework approaches. Currently, the teaching approach is lacking in many aspects such as: the use of the Talk approach in solving learning problems between children and teacher, and the use of technological devices in the classroom's learning. Zakaria and Iksan (2007) in the *Journal of Mathematics, Science and*

[551] Ministry of Education. 2012. *Preliminary Report, Executive Summary, Malaysia Education Blueprint*, 2013-2025.

Technology Education assert that there are two pedagogical limitations in Malaysian schools[552]. Lecture-based instruction and teacher-centred instruction has been identified as passive acquisition of knowledge, students become passive recipients of knowledge and resort to rote learning. They claim that the teacher-talk technique - using lectures, directed demonstrations and simple Q & A, which dominates 80% of the talk in most classrooms – generally leads to students seldom asking questions or exchanging thoughts with other students in the class[553].

The Dialogic Framework is to ensure that Malaysian children are being equipped with the knowledge and skills required for developing higher-order thinking skills as recommended in the approaches of teaching and learning. These two approaches highlight Talk or Dialogue learning with the ZPD concept. The ZPD concept outlines the teachers' commitment and guidance for children to provide moral encouragement and motivation. A research project conducted by the Faculty of Education, University Kebangsaan Malaysia identifies that the most crucial metacognitive development activities that need to be emphasised in the Malaysian classroom are the ones which ensure children are emotionally supported, teachers are encouraged and motivated and that the students have a voice (Rahman, et al., 2011)[554]. Rahman, et al. stress the needs for teachers to provide encouragement, reaction and reflection on children's ideas by writing their own comments because children in Malaysia are lacking in this aspect.

It is crucial to implement the Dialogic Framework in Malaysian classrooms as Malaysian children's performance on the Trends in International Mathematics and Science Study (TIMSS) and the Programme for International Student Assessment (PISA) is declining in absolute terms. These assess a variety of cognitive skills such as application and reasoning. In 2007, the result shows that Malaysian students score below the international average in both Mathematics and Science with a commensurate drop in ranking. 18% and 20% of Malaysian students failed to

[552] Zakaria, E. and Iksan, Z., 2007. Promoting Cooperative Learning in Science and Mathematics Education: A Malaysian Perspective, *Eurasia Journal of Mathematics, Science & Technology Education, 2007, 3 (1):* pp. 35-39.
[553]Ibid. pp. 35-39.
[554] Rahman, S., Abdullah, M. S., M. Yasin, R., Mohd Meerah, T. S, Halim, L. And Amir, R., 2011. Student Learning Style and Preferences for the Promotion of Metacognitive Development Activities in Science Class, 2011. *World Applied Science Journal 14, Special Issue of Innovation and Pedagogy for Diverse learners:* pp. 11-16, ISSN 1818-4952.

meet the minimum proficiency levels in mathematics and Science. This level represents possessing only limited mastery of basic mathematical and scientific concepts. In 2009, the results from PISA 2009+ (Programme for International Student Assessment) were also discouraging, Malaysia ranked in the bottom third of 74 participating countries, which is below the international and OECD average. Almost 60% of 15-year-olds failed to meet the minimum proficiency level in Mathematics, while 44% and 43% did not meet the minimum proficiency levels in Reading and Science respectively[555].

Malaysian education philosophy, written in 1988 was revised in 1996, it enshrines the Ministry's and Government's vision of education as a means for the holistic development of all children intellectually, spiritually, emotionally, and physically[556].

The TIMSS and PISA results are a cause for concern. The Malaysian Government has recently outlined their aspirations by setting five systems of outcomes to be taken from the Malaysian Education System and Malaysian children. Firstly, the outcomes are for those in the educational system as a whole. The five systems of outcome are: access, quality, equity, unity and efficiency. Secondly, those of individual students are: knowledge, thinking skills, leadership skills, bilingual proficiency, ethics and spirituality and national identity[557]. The report highlights that at the most basic level, every child will be fully literate and numerate. Students must master core subjects such as mathematics and Science, and be informed by a rounded general knowledge of their own country, Asia and the world - their histories, people and geography. Children have to develop their knowledge and skills in another area such as the arts, music and sports. On thinking skills, every child is to learn about how to continue acquiring knowledge throughout their lives by instilling a love for inquiry and lifelong learning. Children should be able to connect different pieces of knowledge, especially in a knowledge-based economy. They have to master a range of important cognitive skills which include problem-solving, reasoning, creative thinking and innovation. The Blueprint (2012) claims that these are the areas where the system has historically fallen short, with students being less able at applying knowledge and

[555] Preliminary Report, 2012. *Malaysia Education Blueprint,* Ministry of Education. http://edureview-download.e-sentral.com/Preliminary-Blueprint-Eng.pdf.
[556] Ibid. pp. 20.
[557] Ibid. pp. 26.

thinking critically outside familiar academic contexts[558]. On leadership skills for example, it shows that there are many areas that the government should focus on such as leadership quality, a good role model, entrepreneurship ability, resilience, emotional intelligence and strong communication skills. The bilingual proficiency is focusing on the ability of every child's proficiency in Bahasa Malaysia (the national language), and in English as the international language of communication. The Blueprint states that upon leaving school, the students should be able to work in both environments. For ethics and spirituality, the strong ethics and spirituality in every child is emphasised on preparing them to rise to the challenges they will face in an adult's life, resolve conflicts, employ sound judgment and principles during critical moments, and have the courage to do what is right[559].

In analyzing the Blueprint, this thesis recognises that there are four out of six systems of aspiration outcomes that are related to this study's contribution to knowledge. The main aim of this thesis is children's cognitive learning development. Those aspiration outcomes emphasise children's leadership qualities which include good communication skills, team working ability, ability to work well with people of different cultural backgrounds and becoming adults that employ sound judgment, be a good decision maker; an individual that contributes to the community, with the ability to resolve conflicts and fight life challenges. Interestingly, these qualities are mentioned in this study. The Dialogic Framework proposes ways of helping children to excel in and out of the classroom, as well as in their co-curricular activities. The main aim is the child's social responsibility and educated individuals. The framework provides useful tools for developing classroom learning activities, and a checklist for children's dialogue and intellectual learning attainment in school programs. Thus, the approaches provide a methodology of Talk for building children's self-confidence, motivational skills and self-esteem. The Dialogic Framework approaches can be applied in a number of ways including class lesson discussion, the teaching of a range of conventional subjects, the use of technology devices with activity games, collaborative learning activities and co-curriculum activities.

[558] Ibid. pp. 28.
[559] Ibid. pp. 17.

Keefer, et al., (2000) claim that dialogue is commitment; the aim of an inquiry into explanation in achieving accurate knowledge, to lead participants toward solving a problem. The participants' understandings, divergence of opinions are sorted, thus, affording them their own personal judgments and accounts (pp. 62 – 78).

The Dialogic Framework approaches emphasise teachers' guidance in carrying the Talk in the classrooms. Malaysian children are to be guided through the concept of exploratory talk, the kind of approach where the teacher must provide through full support that is to be stressed on the lesson, discussion and class assignment. Simply put, a teacher provokes inquiry and initiates talks for the day. Mercer and Littleton argue that Talk can be achieved by providing a guided discussion on the lessons, giving motivation lessons experienced by the children and encouraging sharing opinions among them[560]. Keefer, et al. argue that participants in this kind of productive discussion, show greater interest in the development of ideas and issues. They have the quality of preparing to provide their views better when they seriously listen and pay attention to the conversation and discussion. The children and the teacher will construct arguments that run counter to views that they are discussing or hold.

The Dialogic Framework is useful as a tool for Dialogue or Talk practices in learning activities. The framework provides explicit arguments about children's intellectual and psychological development from existing educational theories in learning contexts and the meaning of shared knowledge. With the use of Talk or Dialogue, children think critically in stimulating lessons, reasoning and sharing knowledge. The framework approaches are conceptualised for children's intellectual development processes of internalizing their perception, attention, sensory-motor and memory with learning. With Talk or Dialogue, children learn to develop emotional control and philosophical skills during conversation.

The most significant contribution to knowledge in this study is about emphasizing the use of Talk or Dialogue in children; be it in the classroom or at home, children must be nurtured with Talk or Dialogue. The Dialogic Framework is timely for Malaysian schools. The teacher may use the framework to examine children's achievement in language

[560] Ibid. pp. 66-68.

and writing skills from time to time in both English and Bahasa Malaysia. The study is to record children's oral proficiency, thinking skills and language exposures. Moreover, with Talk, teachers can evaluate children's learning development skills such as their self-confidence, motivation skills and self-esteem. Observation can be conducted during their class activity with the use of technological devices individually or collaboratively. Hence, the children who progress well with Talk will be recognised for managing a group of students in collaborative activities. As a result, children who succeed in language are equipped with leadership skills and confidence.

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