

**Pragmatism and Dialectics in a Mixed Methods Study with Visual Netnography,
Interviews, Participant-generated Data and Survey**

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Abstract:

A dialectic pragmatist stance provides ways of meaningful engagement with differences encountered in the context of study, in terms of cultural, ethnic, linguistic and other forms of diversity (Onwuegbuzie, 2012). The issues and challenges in the delivery of a multi-faceted and multi-dimensional curriculum as well possible solutions and enablers were also reviewed. The consolidated findings from the study reveal that teachers often use a hybrid pedagogical approach, blending both local and international practices and values in the delivery of the enacted curriculum. The potential and possibilities of culturally responsive, place-conscious pedagogical practices, rethinking the roles of teacher and learner, as well as the need for collaborative partnerships and relationships within communities of practice so as to enable the delivery of a future-oriented curriculum that address issues of equity, sustainability and social justice is reviewed and affirmed. The pragmatist research paradigm engages everyday realities and allow practical methods to elucidate issues from multiple viewpoints and contexts. A dialectical stance comprising of a constructive- interpretivist worldview facilitated the analysis of findings across the data sets.

Introduction

Mixed methods as a research paradigm, has been useful in addressing the different aspects of a phenomena. It has become an integrative approach to achieve complementary findings about different facets or aspects of the phenomenon or issue being investigated. Mixed methods have also been used to avoid biases that can be intrinsic to single method, single observer and single theory approaches or as a strategy to offset for specific weaknesses associated with certain methods (Tashakkori, Teddlie, Greene, & Hall, 2015). Mixed methods research has been used to integrate findings and enhance validity of data and to enable triangulation as a strategy to seek convergence across both qualitative and quantitative methods (Denzin, 2012; Flick, 2018). However, it can also support data findings that demonstrate divergence from the main argument and allow for the development of valid and evidence-based conclusions by grounding them in multiple perspectives, participants, methods and theories (Johnson & Onwuegbuzie, 2004; Shannon-Baker, 2016).

Research Paradigms and Rationale for Mixed Methods

There has been some controversy over the use of the term ‘paradigm’, and the term has a different meaning in science studies and the social sciences. In the scientific field, a ‘paradigm’ refers to a shared set of beliefs and practices that guide a field of study. In social science research, however, Morgan (2007) outlined four common forms the term ‘paradigm’ has been used in the social sciences that had first been largely due to the influence of Kuhn’s writing in his book entitled ‘*The Structure of Scientific Revolutions*’. These four paradigm concepts view paradigms as shared belief systems that impact the way knowledge and evidence is sought and interpreted and range from more general to greater specificity: i) paradigms as worldviews ii) paradigms as epistemological stances iii) paradigms as a shared belief system within a research community and, iv) paradigms as model exemplars of research (Morgan, 2007). These four paradigm concepts fall along a spectrum of specificity and are therefore not mutually exclusive.

For a long period of time, there had been a controversial debate between the quantitative and qualitative purists camps (Guba & Lincoln, 2005). While quantitative traditionalists maintained that research and inquiry should remain objective and social observations should be viewed as entities that can be determined and measured with an emphasis on reliability and validity. A

positivist philosophy implies that biases should be removed and researchers remain emotionally removed from their subjects, while a formal rhetoric, passive voice with technical lingo is used (Maxwell & Delaney, 2004). On the other hand, qualitative traditionalists who are also known as constructivists and interpretivist argue for the necessity of idealism, humanism, hermeneutics and at times, postmodernist stance (Guba & Lincoln, 2005; Johnson & Onwuegbuzie, 2004). The resulting consequences were the *paradigm wars* that highlighted the disparities between the two contrasting research cultures (Howe, 2009). The view now holds that mixed methods research is a third research paradigm that bridges the chasm between pure qualitative and quantitative research (Johnson & Onwuegbuzie, 2004).

Separately, both qualitative and quantitative methodologies go through the phases of data description, constructing explanatory arguments from their data and speculation about the reasons behind the outcomes observed and results. Both forms of traditional research paradigms also attempt to reduce sources of bias in order to improve validity of the research study. All research in the social sciences, in spite of paradigmatic approach, is an attempt to provide justified assertions and statements about persons or groups or communities of persons and the environments in which they inhabit and develop (Biesta & Burbules, 2003; Johnson & Onwuegbuzie, 2004). Post-paradigm wars, mixed methods research offers a plausible and practical alternative to pure qualitative or quantitative research paradigms. The mixed methods research paradigm is inclusive and pluralistic in its approach and legitimizes multiple approaches so that researchers are justified in adopting an eclectic selection of methods to find solutions to research questions. Through understanding the strengths and weaknesses of quantitative and qualitative research on their own, researchers can use multiple strategies, methods and approaches so that as a consequence both approaches can be complementary overcoming the weaknesses and limitation of each paradigm on its own (Johnson & Onwuegbuzie, 2004). For example, the use of visual material data and narrative, with the use of numbers in the quantitative component of the study can create meaning and increase precision to its interpretation and meaning. In addition, with a greater range of methods used, mixed methods research can help to find answers to a wider range of research questions and provide insights that might have been overlooked when only single method research is used. The mixed methods research approach is useful in enhancing the generalizability of results and produces greater comprehensive evidence-based knowledge needed to inform theory and practice. Through convergence and corroboration of findings from different data sources and methods, stronger evidence-based conclusions can be formed.

Pragmatism and Dialectics in Mixed Method Research

From the historical perspective, the evolution of pragmatism in research within the social sciences has been debated and discussed in Biesta & Burbules (2003) 'Pragmatism and Educational Research. Deweyan pragmatism and its key ideas was highlighted, and the philosophical standpoint allow an elucidation of the key consequences of pragmatism, such as viewing knowledge as way of refining and supporting everyday problem-solving and the kinds of educational research questions that are chosen for a study. The pragmatist approach places a high value and regard for the reality and human experiences and its impact on action and takes on a values-oriented strategy that is derived from cultural and shared values such as democracy, social equity and progress. It rejects traditional philosophical dualisms and moves toward a middle ground that provides practical and common sense strategies in making methodological choices and seeking solutions. Theoretical principles and concepts are viewed based on their workability, predictability, and application value. Theoretical applications informing effective practice is specifically advocated (Johnson & Onwuegbuzie, 2004).

Deweyan pragmatism replaces abstraction with a stress on human experience as the constant interaction of beliefs and action and sees knowledge as an active inquiry reciprocal interactive relationship between beliefs and action (Morgan, 2014). Instead of framing social science research as a commitment to an abstract set of philosophical beliefs, pragmatist research focuses on beliefs that are directly related to actions and shifts the emphasis towards how researchers make choices and decisions in the way they conduct research. In the past, a metaphysical paradigm based on philosophical foundations was an expectation as an approach in social sciences research, however, there has been a shift towards pragmatism and its association with mixed methods research in more recent years (Biesta & Burbules, 2003; Abbas Tashakkori, Teddlie, & Biesta, 2015).

As debated by McChesney & Aldridge (2019), issues have arisen as a consequence of adopting a specific paradigm in mixed methods research and alternative stances that include a-paradigmatic, dialectical or pragmatist paradigm approaches have been considered. Although one purpose of mixed methods research is that of triangulation which allows greater confidence in the inferences made when results from more than one method is congruent or convergent, however, when inquiry and findings are divergent, contradictory or dissonant, the adoption of a dialectic stance holds these differences with equal regard (Greene & McClintock, 1985; Tashakkori et al., 2015). A dialectic stance provides ways of meaningful engagement with differences encountered in the context of study, in terms of cultural, ethnic, linguistic and other forms of diversity.

Contribution to Mixed Methods Research

The following study employs a mixed methods approach that is novel in engaging an embedded quantitative component within the QUAL phase of an exploratory sequential mixed methods study using visual netnography. Visual netnography integrated into the QUAL phase gathered data from a range of centre types through a critical case sampling approach using the social media sites of these centres. Visual netnography as an online qualitative methodology is relatively innovative and falls within the broader category of virtual ethnography of online communities and social media spaces (Costello, McDermott, & Wallace, 2017). In the context of this study, the approach of netnography was more observational and non-participatory. However, this was combined with on-the-ground ethnographic observations and inquiry that was participatory in nature. The pragmatist research perspective enabled both a passive non-participatory approach through netnography, as well as allowing socially equitable responses through the interviews, and participant-generated data. There was also a range of participant types (both teacher-educators and school-centres). The survey phase enabled a number of issues to be examined through a more objective and measurable approach so that data findings may provide a basis for curriculum decision-making, policy-making and future research directions. The data findings from all data sets were collated and interpreted in light of current research and literature to provide the conclusions and recommendations from the study. The following sections incorporates the use of pragmatism in methodological decisions while a dialectic stance is adopted in making the inferences from the data findings and results from the eclectic research methods.

Context and Background of Study

The research that will be examined in this study was based on a multiphase project exploring curriculum enactment, its challenges, and enablers in early childhood education settings, specifically in the context of Singapore. This area was of particular interest because despite having a national curriculum framework (MOE, 2013) in place, there is a of diversity of

cultures, languages, as well as global and international influences in many ECE settings in the country (Bautista, Ng, Múñez, & Bull, 2016; Tzuo, Liang, & Yang, 2014). Being a multicultural society, with its dimensions embedded in everyday lives, multiculturalism was based on the recognized founding ethnic groups of postcolonial Singapore (Goh, Gabrielpillai, Holden, & Khoo, 2009).

The intention of the study was also to explore and better understand the range of variation in curriculum delivery and enactment, programme content, environments, and the spectrum of teaching and learning approaches in the local ECE centres. The research questions of the study was also intended to provide greater insight into how early childhood educators perceived their roles and the approaches adopted in meeting the needs and expectations of a diverse and heterogeneous population and community.

The study sought to explore and elucidate the similarities and spectrum of diversity through naturalistic observations, inquiry and through the perspectives of early childhood educators and other professionals in the sector. The next section will further elaborate other practical objectives strategies.

Methodology and Research Methods

Based on a pragmatist approach, the research methods were chosen based on their strengths and an exploratory sequential mixed method model was used in the planning of the research design. An ethnographic approach was adopted within the qualitative phase.

Interviews, participant-generated data, and ethnographic observations

Twenty-two teacher participants from a variety of ECE centre settings that included privately operated, community-based, and corporately owned centres provided the source of the data findings. A semi-structured interview was planned. However, during the actual interviews, a relatively unstructured and open-ended strategy was also used. Where possible, naturalistic observations were made at the centre environments where these teachers worked and participant-generated data in the form of curriculum plans, selected meeting minutes and curriculum work samples were shared with the principal investigator. Purposeful sampling was used to select interviews participants using selection criteria that included individuals from a range of centre settings with relevant experiences and expertise and who were able to communicate their perspectives and experiences with the researcher.

Interview topics focused on teachers' participants sharing of past and current experiences in the way they delivered the curriculum. Other related areas and issues including collaborative partnerships with their colleagues, community, and family in the process, as well as challenges and obstacles encountered were also talked about. The perspectives of interview participants regarding issues within the curriculum framework were also examined. Where possible, interview participants were asked to share their curriculum work samples from their classes, more specific intended curriculum goals, and specific aspects within their own centre settings. Where the interview participant was agreeable, some form of their life and work histories, beliefs and values were also explored.

Five of the twenty-two interview participants were selected to provide a more in-depth understanding of the processes and issues of curriculum enactment, as well as the challenges and concerns faced by early childhood educators in Singapore. A critical case sampling approach (Omona, 2013; Palinkas et al., 2015) was used to provide greater insight into the personal, professional and lived experiences of early childhood educators in Singapore and to

shed light on how their beliefs and views influenced the pedagogical practice. A better understanding of their views concerning issues around current educational policies, diversity, equity and inclusion in early childhood education settings was also sought. A level of phenomenological analysis (Guest, Namey, & Mitchell, 2017) was made through in-depth conversations and comparative analysis between data sets was used to provide greater insight.

Qualitative ethnographic inquiry has been described as naturalistic, practice-guided or interpretative (Geelan, 2007). These naturalistic observations helped to overcome some of the limitations of relying solely on interview data and also helped triangulate data from different sources (Reeves et al., 2013). The intended purpose for these exploratory and open-ended observations in the everyday settings of teacher participants was to better understand curriculum processes and uncover everyday issues and challenges in the process of curriculum delivery. This allowed more detailed and comprehensive account of phenomena and processes that would not have been captured in a one-off interview.

Visual netnography

Visual ethnography captures a sense of place and learning environments through photography and/or video. The historical, social and cultural contexts and other material and sensorial realities of place may also be found in this form of ethnography (Pink, 2011; Prosser, J., & Schwartz, 1998). Visual netnography which may be seen as an extension of the visual ethnographic research methods, albeit with limitations that may not allow such as a sensorial approach, is based on online internet-generated data (Costello et al., 2017). The term ‘visual netnography’ was described by Kozinets (2006) to be originating from ‘visual ethnography’ and ‘internet’. It has been used as a qualitative research method adapting traditional ethnographic approaches to investigate online communities, practices and cultures, made possible through computer and internet-mediated platforms and communications (Addeo, Delli Paoli, Esposito, & Ylenia Bolcato, 2019).

In this study, the goal of visual netnography was to obtain evidence of the processes of curriculum enactment using visual data from the social media sites of various centre types and their learning environments. The five centres were selected based on their activity and were assessed to be generally representative of the type of centre they were identified as. These five centres included one community-based centre, two privately operated and another two corporate-operated centres. Twenty-five consecutive posts that met the selection criteria were collated from each centre for a period of up to twenty-four months. Selected social media posts fulfilled the following criteria:

- i) involved children as active participants in the learning environment or
- ii) both children, teachers and/or facilitators engaged activity or
- iii) children, teachers, and parents involved in or participating in an event or activity.

Each selected social media post typically consisted of a cluster of photographic images captured during a particular activity or event that was usually accompanied by a brief explanatory commentary. The sample that was collated for this study consisted of 125 posts from the social media sites of the five representative centres. Each of these posts were coded and the frequency distribution of each thematic code was collated for descriptive and comparative analysis (See Table 1).

Table 1: Distribution of social media posts of 5 centres into thematic codes

Thematic Codes	Amber	Emerald	Topaz	Pearl	Opal	Frequency counts	Frequency distribution
Approaches to Learning	10	3	14	12	10	49	9.4%
Authentic /Experiential Learning	10	3	4	3	11	31	5.9%
Bilingualism / Mother Tongue Learning	2	0	2	7	1	12	2.3%
Community Partnerships	5	13	5	0	10	33	6.3%
Culturally Responsive Practice	1	9	2	5	3	20	3.8%
Developmentally Appropriate Practice (DAP)	6	1	9	3	0	19	3.6%
Environmental Awareness/Sustainability	6	2	4	3	9	24	4.6%
MI Integrated	6	3	2	8	4	23	4.4%
<i>NEL Framework domains</i>							
Aesthetic and Creative Expression (ACE)	3	9	5	14	8	39	7.5%
Cognitive development/skills (CD)	3	0	7	5	8	23	4.4%
Discovery of the World (DOW)	17	10	8	14	15	64	12.3%
Language and Literacy (L&L)	5	1	2	7	7	22	4.2%
Physical Motor Skills (PMD)	7	8	8	18	11	52	9.7%
Social Emotional Learning (SEL)	9	14	14	8	12	57	10.9%
Parent Partnerships	2	11	5	2	6	26	5.0%
Performance-based learning	0	2	0	1	4	7	1.3%
Project based learning	2	1	0	3	2	8	1.5%
Technologies	3	0	0	0	1	4	0.8%
Transitions	2	2	3	1	1	9	1.7%
TOTAL	99	92	94	114	123	522	100%

Survey

The survey instrument was the planned quantitative phase of the exploratory sequential mixed method study and was designed based on the preliminary qualitative data obtained from the initial qualitative phase consisting of ethnographic and interview data, as well as the literature review relevant to the ECE curriculum. Besides some basic demographic data obtained from the 92 survey participants, several themes were found in the survey questions. One of the thematic objectives was to examine the degree of influence of the national curriculum framework and to what extent it was reflective of the intended curriculum. Other factors and influences on the processes of curriculum enactment and delivery were also examined. The thematic codes and categories that emerged from the qualitative phase and literature review influenced the design of the survey instrument. This included the perception of teachers regarding their work environment (OECD, 2009; Steele, Hives, & Scott, 2016), the types of

technologies used in the process of pedagogical assessment, documentation, practice, as well as in the communication process with families (Hooker, 2017; Sullivan & Bers, 2018; Yelland & Gilbert, 2017). Other areas of interests within the survey instrument were regarding the perceived professional development needs of ECE teachers and curriculum priorities (Bautista et al., 2016; Lee & Lee, 2013).

The administration of the survey was through direct face-to-face and online methods. The 92 completed surveys were from a non-random sample of 105 early childhood practitioners that included forty teacher participants attending professional development and preparatory programmes at a local institute in Singapore and another sixty-five early childhood professionals who responded to an online survey. Of the 105 surveys returned, 13 surveys were invalid as they were incomplete or did not get past the demographic profile questions. The survey participants came from a variety of centre types: privately-, community- or corporately operated types. The survey therefore facilitated the validation of the data collected during the qualitative phase and allowed the use of quantitative descriptions of the population of early childhood educators through descriptive statistics. Questions in the survey were in a format that presented choices and only open-ended responses were required if the respondent selected the 'Other/s' from the given options. Data was presented in a summarized visual format so that trends and patterns in the data could be identified (Abbott, 2017).

Key Research Findings

The data findings from each phase of the mixed method study was analysed and interpreted. On completion of the final phase, conclusions were drawn from the integrated findings from all stages of the study. It was anticipated that triangulation from the findings, different sources and perspectives provided a greater in-depth and holistic understanding of the processes of curriculum enactment, the challenges and some of the enablers in the ECE curriculum (Carter, Bryant-Lukosius, DiCenso, Blythe, & Neville, 2014; Denzin, 2012; Flick, 2018). The findings of each phase will be summarized in sequence in this section.

Ethnography

In the ethnographic exploratory observations stage of the study, nine centres were visited, and several dimensions of the curriculum were examined through naturalistic inquiry and observation. This included a sample of curricular activities, learning environments, day-to-day routines and transitions, as well celebrations of traditional festivals and engagement with the community where possible. The forms and types of pedagogical documentation and assessment were also explored in the different centre contexts. Curriculum activities highlighted inquiry-based and project-based learning through multimodalities. In the case of one specific centre setting, the use of Gardner's theory of multiple intelligences in its main curriculum framework was highlighted. Other critical dimensions of the curriculum such as the learning environments and quality interactions were also recognized. These naturalistic observations may be defined as what can be defined as the descriptive curriculum and is what actually transacts in the enacted curriculum as compared to the planned or intended curriculum (Ellis, 2003). Participant-generated data and visual materials such as students' work samples, stills and video documentation was sometimes shared by the teacher participants with the researcher and this form a part of the findings (Kortegast et al., 2019). This was used to share what was part of the process of curriculum decision-making and the outcomes (Pfister, Vindrola-Padros, &

Johnson, 2015). Literacy-based and the language experience approach was highlighted for example, was highlighted in some of the participant-generated data.

Although pedagogical documentation can be in several forms, most of the formal documentation in the nine centres were for parent-teacher conference meetings that are held twice yearly. Prevalent forms include checklist assessment and anecdotal observation documentation of activities that took place throughout the semester. Milestones and competencies within each age-group level generally categorized in the (Nurturing Early Learners NEL) national curriculum framework domains of social-emotional, physical motor, language and literacy, numeracy, cognitive and discovery of the world (MOE, 2013). Anecdotal records used in portfolios are often used as a form of narrative assessment that describes the activities of the child in a somewhat objective approach. In one specific centre setting (CO-A), Gardner's theory of multiple intelligences was used as a basis for the skillset domains observed and documented. These eight intelligence skillsets were verbal-linguistic, logico-mathematical, naturalistic, interpersonal, intrapersonal, visual-spatial, musical and kinaesthetic modalities (Gardner, 1993; McNamee, Chen, Masur, McCray, & Melendez, 2002).

As an extension to conventional naturalistic approach to ethnography, visual netnography (as defined earlier) was used in the qualitative phase of the study. These social media blog posts captured the changing environments within each centre with routines, transitions and during the celebration of festivals and various events using 25 consecutive posts over a period of between 2 months to 24 months. Each social media post cluster was coded through content analysis into three to five code categories. There was 522 counts coded into 17 code categories. The code categories from the national curriculum framework (NEL domains) (MOE, 2013) that were most well represented included those that corresponded with the codes 'Discovery of the World' DOW (12.3%), 'Social Emotional Learning' SEL (10.9%) and 'Physical Motor Skills' PMS (9.7%). The highest frequency distribution of code category counts outside the national curriculum framework domains was that of 'Approaches to Learning' (9.4%), 'Community Partnerships (6.2%) and Authentic/Experiential Learning (5.9%). Items coded into 'Approaches to Learning' group were occasions where activities and learning experiences were innovative or challenged learners to adopt out-of-the-box lateral or critical thinking skill subsets. These items also demonstrated alternative approaches and strategies to facilitate learning experiences on a specific thematic unit or topic. Four of the five selected representative centres had a relatively high frequency distribution of counts in this code category. For the Authentic/Experiential Learning group, the activities that were coded into this group were those where facilitated learning experiences enabled the children to engage in real world settings and contexts, including planned interactive experiences with community helpers or allowed young learners to immerse themselves in out-of-classroom learning experiences.

Interviews

Several key findings from the in-depth interviews with five of the teacher participants will be articulated here. All five interview participants were familiar with the national curriculum framework (MOE, 2013) although only four of the teachers recognized the use of the NEL framework as the curriculum guide their work settings. The remaining one teacher worked in an International Baccalaureate School and stated that she did not base her curriculum on the national curriculum framework. Three of the five teachers stated that their current ECE workplace setting adopted some aspects of the Reggio-Emilia inspired educational philosophy as well. One of the five teachers who practiced mainly as a music educator in ECE settings

shared that the approach used by her centre was brought from the United States. She acknowledged that the way the programme was being delivered in the local ECE settings could be quite different from the way it was delivered elsewhere because of the differences in cultural contexts. The five ECE practitioners shared about their personal philosophies and approaches to their practice, the influence of parental attitudes and expectations and the impact of various policy changes over the years. One of the shared beliefs that was particularly emphasized was the emphasis on social emotional learning and development, as well as making nurturing creative and critical thinkers a priority in the early childhood curriculum despite the emphasis on academic learning by many parents. Such differences between teacher and parent expectations and priorities in the ECE curriculum could be a cause for conflict (Lane, Stanton-Chapman, Tina Jamison, & Phillips, 2007) although improving communication and rapport in teacher-parent partnerships would help to resolve such issues. There was also a strong advocacy for inclusive education practices and policies and for differentiated instruction with a team approach to allow for differences in abilities, needs and levels of readiness. As observed and commented by several interview participants in the in-depth interview conversations, much of early childhood education and parallel service providers have become privatised and marketized. The observation was that this type of service provision has led to much more bureaucracy and administrative processes in order to permit teachers themselves to make modifications and adaptations as to how they delivered the curriculum to meet the needs of diverse learners. The limitation to this was that directives given from the top-down approach do not always allow teachers the flexibility and freedom to be creative, as decisions within the organization is often based on a system of quotas and cost-structures as supported by other research studies (Sprimont, 2010).

Content and Thematic Analysis

Further interpretation and analysis of interview findings from the total sample of the 22 teacher participants categorized data findings into three main themes: i) curriculum decision-making ii) curriculum change and transformation iii) challenges faced by ECE practitioners. The primary research questions in the study are directly or indirectly addressed by these dominant themes identified. Interview transcripts were read and coded for trends or patterns and frequently occurring themes were based on 'units of meaning' as units of analysis (Bray, Adamson, & Mason, 2007; Evans, 2017; Wengraf, 2016). The first dominant theme from the data findings from the 22 interview participants was that regarding the processes and influences on curriculum decision-making. Contextual factors influencing this process were the local national curriculum framework and local educational policies that affected the way the curriculum was delivered. Other influential factors were grouped into personal, pedagogical, sociological, including local contextual factors. Teachers shared about their life experiences, as well as other sources of cultural capital and funds of knowledge through the families and communities. There was the recognition of established discourses in early childhood education practice that included play-based and child-centred pedagogy, particularly in Reggio Emilia-inspired centre settings although these approaches have also been advocated and highlighted within the national curriculum document. Cultural-historical discourses that included child development and socio-cultural theories were part of the discourse and educational philosophies that were embedded within teacher preparation programmes and therefore part of the teaching philosophies of Singapore ECE teachers. Other strong influences discussed and shared by the interview participants were those of centre-specific practices and curricula, as well more internationally recognised approaches that include the Montessori Method, Multiple Intelligences theory based, and the Reggio-Emilia inspired approaches.

Change and transformation in the way by which the curriculum is enacted was the second major theme identified in the interview findings from the teacher participants, specifically by those who had worked over a period of more than a decade in the sector. This was based on the presumption that the changes has taken place gradually, with the launch of national curriculum framework in 2003 (Tan, 2007), its revision and the formation of Early Childhood Education Agency, Singapore (ECDA) for the preschool sector in 2013 (MOE, 2013; Tan, 2017), serving as catalysts for change. There has been a gradual but observable and deliberate change of the pedagogical fulcrum from traditional teacher-centred approaches to more learner-centred, and inquiry-based approaches, with an emphasis on the child's voice, something that is also observed and practiced with other ECE settings elsewhere around the world (Ang, 2006; Formosinho & Formosinho, 2017). As described by one specific teacher participant who had been working in the ECE sector for more than a decade: 'When I first started, there was a great deal more emphasis on pencil and paper tasks and children were sitting at tables doing written task rather than engaging in play'. Priorities identified and emphasized by teacher interview participants who elaborated on their experiences in practice were that of social-emotional learning, life-skills and to nurture creative and critical thinkers who are active participants in their learning experiences. In terms of pedagogical documentation and assessment, and observing the child's progress, most centres have shifted from what was used widely in the past, a standard checklist of key competencies and milestones to approaches that are regarded as more holistic, and participatory in nature. This was often primarily based on the use of a portfolio-based approach. New technologies such as the interactive whiteboard, iPad, mobile apps and STEM / STEAM programmes have become available particularly in larger corporatized centres. Mobile interactive platforms and social media have also facilitated communication and involvement of parents in the children's learning experiences. There has also been an observable shift in parents' attitudes towards non-academic learning areas, as well as greater government support for innovative projects with the community and families.

The third thematic findings elaborated using interview data from the 22 teacher participants was that of the challenges and tensions that have arisen in the processes of curriculum delivery, policy and management changes, working conditions, parental expectations and a number of other related issues. One specific comment was that the conflict and differences in cultural context when engaging with approaches that have been used successfully in other cultural contexts: 'Our local culture is such that it is not always ingrained in the child to always take the lead and so an entirely RE-inspired and child-led approach is not always going to work'. Another critique was that of using a rigid curriculum framework that some felt was too restrictive and prescriptive. Despite the increasing use of technology to facilitate teachers' work, a relative frequent comment was that paper work and documentation had become more complex and demanding rather than technology simplifying and streamlining processes. Changes in early childhood teacher requirements introduced in the recent years have also meant that some who had been working in the ECE sector for a while had to undergo professional development and upgrading programmes in order to meet these qualifications requirements. Other concerns that were brought up included high staff turnovers, salaries that were not on par with graduates in other industries, the low public perception of ECE work and relatively lack of professional status of early childhood teachers in Singapore. Survey findings are summarized next.

Survey

The survey data came from 92 early childhood practitioners working in a variety of centre settings. The first section of the survey provided a brief demographic profile of the survey

respondents. 75% of respondents were between the ages of 18 to 35 years. Almost half of respondents (47.8%) were from privately operated centres. 72.5% worked in childcare or day-care settings and played a variety of roles. However, 71.7% saw their main role as class level teacher. 29.7% of survey respondents held a degree in ECCE while 53.8% had at least a diploma in ECE. The remaining questions of the survey gave an indication of the main forms and influences on the curriculum, types of pedagogical documentation used, the use of technologies, challenges perceived in ECE work and perceived priorities for professional development. A few of these findings will be highlighted in this section.

In terms of curriculum approaches that teachers were familiar with or were currently using in practice, the national curriculum guides ‘Nurturing Early Learners (NEL)’ – 18 months to 6 years and the ‘Early Years Development Framework (EYDF)’ – Infancy to 3 years, were the most well-established with ECE teachers in Singapore. Teachers were familiar with Reggio-Emilia inspired (37.0%), Montessori Method (33.7%), and Multiple Intelligences theory-based (31.5%) approaches. In terms of current practice however, these percentages were relatively lower. 5.4% of responded indicated ‘Others’ and this was elaborated in an open-end response space with thematic-based, literacy-based, IB PYP, Nordic Steiner, play-based, ‘Orf, Kodaly and Dalcroze’ and centre-specific approaches. Table 2 shows the frequency distribution of responses in terms of familiarity and current practice for curriculum approaches used. Survey respondents could indicate more than one response.

	NEL	EYDF	RE	MM	MI	Others
Familiarity	77.2%	70.7%	37.0%	33.7%	31.5%	5.4%
Practice	75.0%	51.1%	16.3%	12.0%	6.3%	7.6%
Specify ‘Others’ – thematic-based, literacy-based, centre specific approaches, IB PYP, Nordic Steiner, play-based, ‘Orf, Kodaly & Dalcroze’.						

The survey responses concerning several specific influences on the curriculum was also queried. The results in terms of the impact of the national curriculum, children’s interests and from parents/families supported earlier findings from qualitative data and interviews that these had at least a moderate to a great influence on teachers’ planning and delivery of the curriculum. With the national curriculum framework, 72.8% indicated that it had at least a moderate amount of influence on their teaching practice while 97.8% indicated that children’s interests had at least a moderate to a great of influence on their planning. 71.8% of survey respondents also indicated that parents and families that includes parental expectations, cultural funds of knowledge and related factors have at least a moderate to great impact on their teaching practice and curriculum. Table 3 shows the detailed frequency distribution of the survey responses on a rating scale for each of these independent various.

	A great deal	A lot	A moderate amount	A little	None at all
NEL framework	17.4%	25.0%	30.4%	21.7%	5.4%
Children’s interests	32.6%	39.1%	26.1%	2.2%	0.0%
Parents and families	12.0%	17.4%	42.4%	18.5%	9.8%

Another aspect of the ECE curriculum examined was that of pedagogical documentation. The survey indicated that the most prevalent forms of pedagogical documentation and assessment was the use of checklists and portfolios. Anecdotal observations, as well as digital

documentation that is often part of the child’s portfolio was also noted to be high in prevalence. Table 4 shows the frequency distribution of the various approaches and methods of pedagogical documentation in terms of familiarity and practice.

Table 4 – PEDAGOGICAL DOCUMENTATION (n=92)	Familiarity	Practice
Checklists	93.5%	87.0%
Anecdotal Observation	90.2%	70.7%
Time/Incident Frequency Sampling	42.4%	12.0%
Running Records	51.1%	18.5%
Photo/Video Documentation	80.4%	54.2%
Portfolios	95.7%	91.3%
Learning Stories	25.0%	12.0%
Others	1.1%	0.0%

The use of technologies in facilitating pedagogical practice, documentation, as well as interactions and communications with parents/families was also explored. ePortfolios was found to be used in 52.2% of survey participants ECE centres. The use of interactive mobile platforms and apps was found with 55.4% of teacher respondents. These included mobile platforms that allowed ePortfolios, digital documentation and other forms of communication and information to be shared with parents/families. Other forms of technologies were also indicated with respondents specifying the use of digital cameras, laptops, music equipment, and Keebot (robotics). Table 5 shows the prevalence of some of these technologies.

Table 5 - USE OF TECHNOLOGIES (N=92)	
ePortfolios	52.2%
Interactive Whiteboards	10.9%
iPads	51.1%
Mobile Apps	55.4%
None of the Above	15.2%
Others	3.3%

When asked to rank five items from the most challenging to the least challenging with regards to ECE work, the highest frequencies for most challenging was that of ‘Documenting children’s learning and progress’(28.3%) and ‘Planning the curriculum’ (28.3%).These two items that were ranked by equal number of respondents as most challenging. ‘Meeting and talking with parents and caregivers’ (18.5%), ‘Implementing developmentally appropriate activities’ (16.3%) and ‘Collaborating with Colleagues’ (8.7%) were next. Table 6 shows the distribution of what survey respondents perceived was most challenging in ECE work.

Table 6 - MOST CHALLENGING IN ECE WORK (N=92)	
Implementing developmentally appropriate activities	16.3%
Collaborating with colleagues	8.7%
Meeting and talking with parents and caregivers	18.5%
Documenting children’s learning and progress	28.3%
Planning the curriculum (weekly and daily activities)	28.3%

Survey respondents were also asked to select three key work descriptors from seven items which included three positive, three negative descriptors and ‘Others’. The highest frequencies

were for ‘Innovative and challenging’ (68.5%) and ‘Collaborative’ (57.6%). The third highest frequency was on a negative descriptor ‘Overwhelming’ (53.3%). Table 7 shows the frequency distribution for the work descriptors.

Innovative and challenging	68.5%
Repetitive and uninteresting	19.6%
Creative and rewarding	39.1%
Overwhelming	53.3%
Collaborative	57.6%
High staff turnover	37.0%
Others	7.6%
Specify ‘Others’ – Lack of teamwork, lack of leadership and manpower, resources and budget constraints, uncooperative colleagues.	

Discussion

The discussion here will focus on the way by which the mixed methods approach has been used to answer the central research questions in this study. The first question revolved around the processes and delivery of the curriculum, as well as the change and transformation in the sector. This study investigated diverse centre settings through various approaches that included both physical visits and observations, as well as the use of visual netnography of the social media platforms of five selected centre sites other than those visited in their physical locations. Teachers’ perspectives and sharing of experiences were sought through interviews and the sharing of participant-generated data. The qualitative stage was followed up with a survey that provided results confirming and providing more precise details about certain specific dimensions of the ECE curriculum, pedagogical processes and documentation.

The key dimensions in elaborating on the curriculum enactment with the associated transformation in the Singapore early childhood sector were focussed on aspects of the types of curricular approaches and their influences, parent and community engagement, child-centred pedagogical and pedagogical documentation approaches, sustainable practices and the emergence a blended or hybrid pedagogy. Blended or hybrid pedagogy, inquiry-based, project-based and experiential learning are also in line with international and global trends in earlier studies (Adriany, 2018; Lin, 2014). The spectrum of pedagogical approaches have been built on the foundations of a national curriculum framework that have been aimed to be holistic, integrating curricular priorities also been investigated in earlier studies (Bautista et al., 2016; Choy & Karuppiah, 2016; UNESCO, 2017). Concerning the challenges and concerns faced by early childhood practitioners in this study, this was answered through the two data sets found in the interview and survey findings. These challenges were categorized into themes of personal and professional identities, management and policies, work environments and parental/familial expectations. Consolidated findings and interpretations from all the data sources and findings provided possible answers to the final question in this study on the enabling conditions and the types of further support required in providing an effective and successful early years curriculum. At the micro-level of centre and teachers, the enablers in providing support for a culturally relevant curriculum meeting the needs of learners in the 21st century were elaborated in terms of collaborative relationships and partnerships, rethinking the

roles of teacher and learner, improving the work environment and making policy changes that would support the adaptation and transformation of the curriculum. These enablers would be sustained by a strong government commitment and investment in the sector, unifying ECEC governance, as well as appropriate national reforms.

In conclusion, the study aimed to shed light on the forms of practices within diverse early childhood education settings in Singapore within evolving and fast-changing realities, with the continued influx of influences, ideas and concepts from around the world. The issues and challenges in the delivery of a multi-faceted and multi-dimensional curriculum, as well as possible solutions and enablers were also reviewed. Research and evidence from this study, as well as other relevant and supporting research can contribute to a better understanding of the influences on curriculum practice and possible barriers to effective practice. The potential and possibilities of a culturally responsive, place-conscious pedagogical practice through rethinking the roles of teacher and learner, as well as collaborative partnerships and relationships within communities of practice. These supporting conditions would enable the delivery of a future-oriented curriculum that address issues of equity, sustainability and social justice. The consolidated findings from the study reveal that teachers often use a hybrid pedagogical approach, blending both local and international practices and values in the delivery of the enacted curriculum.

MMR Contribution

The use of a mixed methods research design allowed the research questions to be addressed using methods that facilitated a range of data forms to be collated, analysed and interpreted. As discussed earlier, the philosophical paradigm of pragmatism engages everyday realities and enables the researcher to select the most practical methods to elucidate issues from a number of viewpoints and contexts. The dialectical aspect of the mixed methods approach also involves other worldviews such as the constructive-interpretivist stance that enables the researcher to construct, conceptualize and interpret the findings across the different data sets. Based on the Deweyan philosophy within the pragmatist paradigm, it can be said that the knowledge and conclusions based on findings from a mixed method study are constructed assertions rather than 'the Truth' (Tashakkori et al., 2015, p.19). The pragmatist dialectical approach to mixed methods research design also contributes to a more practical basis about the justification of the study design and to better understand implications of the study.

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