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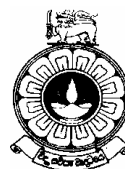
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Editorial

This is the Volume 15, Number 1 of the OUSL Journal, the Journal of The Open University of Sri Lanka, which is published biannually. The articles published in this Volume include research based on English Language Teaching, Chemistry, Psychology, Law, Health Sciences, and Education.

The paper titled *Inclusivity and Diversity in ELT Material: Critical Textual Analysis as a Pedagogical Tool* explores the ways in which critical discourse analysis (CDA) can be used to make language instruction more inclusive. Mainstream education largely focuses on completing the curriculum and preparing students for standardized examinations. As a result, there is less effort expended on creating awareness on diversity, equity, and exploring ways in which educational contexts could be made inclusive spaces where all learners and educators feel accepted and safe. Textbooks that students study and internalize reproduce power structures that exist in society. As the focus of instruction is often to prepare students to perform well at exams, the content in textbooks is often not questioned. As a result, instruction in schools normalize the discourses and content present in textbooks. This paper draws in from theories of CDA and provides educators a critical lens through which they can scrutinize textbooks and find theoretically sound ways of making them inclusive. The paper discusses some of the key tenets of CDA and how teachers can use CDA as an analytical tool that helps them to scrutinize textbooks and rethink instruction in ways that help all learners to fully engage in the teaching-learning process irrespective of their sociocultural backgrounds.

Light-emitting materials with tunable luminescence properties are of interest due to their wide-ranging applications as chemical sensors, biological labels, organic optoelectronics and phosphorescent organic light-emitting diodes (PhOLEDs). Phosphorescent organometallic complexes, containing iridium, ruthenium, rhenium, copper and platinum, have also been of interest in applications in the above-mentioned areas. It was found that cyclometallated platinum(II) complexes, containing tridentate

NCN or NNC ligands are slightly superior for luminescence quantum yield when compared to cyclometallated platinum(II) complexes with bidentate CN ligands. In the research study *Synthesis of Cyclometallated Pt(II) Complexes of a Bulky Bipyridine Ligand*, the author has used a sterically demanding polyphenylene derivative with a bipyridyl unit to prepare several cyclometallated platinum(II) complexes. Synthesis of this pyridyl-centered polyphenylene, 3,4,5,6-tetraphenyl-2,2'-bipyridine and its coordination chemistry with rhodium and palladium had been reported previously. The objective of this study was to explore the chemistry of this ligand with platinum(II) centers in order to prepare possible photoactive luminescent complexes. This bulky ligand containing four phenyl groups was converted into a quite insoluble cyclometallated terdentate complex [(CNN)PtCl]. It was made more soluble by replacing the chloride ligand to produce the corresponding trifluoroacetate and acetylide. Introduction of a neutral ligand such as pyridine or phosphine generated more soluble salts of the type [(CNN)Pt(L')]PF₆ where L' = PPh₃, 4-dimethylaminopyridine. A binuclear complex, bridging two (CNN)Pt units with bis(diphenylphosphino)methane was also prepared. All complexes were characterized by a combination of elemental analysis, Infra-Red, Mass and Nuclear Magnetic Resonance spectroscopy. Two of the key complexes were characterized by X-ray crystallography.

Emotions play an important role in human life. The aim of paper titled *Emotional Experiences and Expressions of Individuals in the Sri Lankan Context: The Roles of Gender, Culture and Religion*, was to explore the emotional experiences and expressions of individuals, the variation in emotional expressions in different social relationships, and individuals' perceptions about the cultural and religious appropriateness of expressing certain emotions. In this study, the researchers examined how often individuals experience basic emotions and some secondary emotions, to what extent they think that they can express these emotions, the appropriateness of expressing basic emotions to individuals in various relationships, and the appropriateness of feeling and expressing basic emotions according to their cultural

and religious backgrounds. Findings of this study suggested significant gender differences in experiencing and expressing emotions and provided further evidence for previous findings in relation to the gender difference in experiencing certain emotions. In addition, there were significant relationships between feeling and expressing some basic emotions. It was found that individuals tended to choose what is appropriate and inappropriate in relation to their relationships with other members in the social environment. Findings also revealed that individuals accepted the experience and expression of some emotions according to their cultural and religious backgrounds suggesting that both cultural and religious backgrounds influence individuals' emotional experiences and expressions. Emotion has a biological base; however, it seems that individuals' emotional experience is influenced by the socio-cultural environment in which they live. Culture shapes the way individuals experience and express emotions in different social situations. Present findings strengthen the evidence of the influence of some socio-cultural factors on emotional experience and expressions of individuals and thereby emphasizing the importance of utilizing a cultural approach in understanding emotional experience and expressions of individuals in a given culture.

The paper, *The Need for Reforming the Sale of Goods Ordinance of Sri Lanka: A Comparative Analysis*, is a comparative analysis on the Sale of Goods Ordinance, No. 11 of 1896 which governs the sale of goods in Sri Lanka. The author followed the traditional black letter approach of socio-legal research. The Sri Lankan Ordinance is a copy paste of the English Sale of Goods Ordinance of 1893. Although the English law related to sale of goods has been amended with the modern-day developments, the Sri Lankan Ordinance has remained the same even after a century and more. The static nature of the Sri Lankan SGO has led to several crucial problems. The research discusses the nature of selling goods, geographical limits related to sale of goods and finally the methods by which sales are concluded. Even though the remedies are there to protect the parties under the SGO, there are loopholes which need to be addressed by amendments to the SGO. Therefore, the

research discusses the remedies introduced to the parties by addressing the identified loopholes. In all the above situations, this research offers many statutes currently used in Sri Lanka such as Electronic Transactions Act, No. 19 of 2006, Consumer Affairs Authority Act, No. 9 of 2003 etc. for comparative purposes and at the same time, discusses and compares the laws related to sales of goods in the UK with those of Sri Lanka. Finally, the research in its conclusion offers suitable recommendations to the laws related to sales of goods in Sri Lanka and emphasizes that the Sri Lankan law related to sale of goods should be amended to reflect the latest needs in the commercial world.

Bacterial infections are one of the main causes of human diseases. Especially, catheter-associated urinary tract infections caused by biofilm producing bacteria are the most commonly reported hospital-acquired infections. Biofilm is defined as accumulation of the microbial organisms that is permanently attached to biotic and abiotic surface and generally enclosed in self-produced extracellular polysaccharide substances. Indwelling urinary catheters support to increase therapeutic results of patients, however, these devices are more prone to colonization by biofilm bacteria. Catheterized urinary tract provides ideal conditions for the development of biofilm populations. Moreover, Biofilm on urinary catheters results in persistent infections that are resistant to antimicrobial therapy. If the infection is not treated, it may consequently lead to bacteraemia, bacterial vaginosis, chronic renal infection, acute pyelonephritis, bladder cancer and in certain cases death.

Nowadays mortality rates are increasing and there is an urgent requirement to develop strategies to prevent and eradicate biofilm production on urinary catheters. The knowledge of biofilm formation on catheters and antibiotic resistance profile of bacterial species are most important to find new techniques in therapeutic use. However, several studies indicate that microbial studies alone will not eradicate catheter-associated urinary tract infection. Antifouling and biocidal coatings on the catheters are currently being investigated and it has been proved that herbal products also express anti-biofilm activity. Therefore, considering the magnitude

of catheter-associated urinary tract infection, research related to catheter associated biofilm detection would be an urgent requirement in the developing countries such as Sri Lanka. Detection of biofilm formation and to find strategies to control the biofilm formation are the most important areas for future therapeutic use. The findings of the research article *The Role of Bacterial Biofilms in Infections and Effective Prevention Strategies for Biofilm Formation in Urinary Catheters*, will contribute to generate new findings for the Sri Lankan ‘healthcare’ community.

Over the decades, the importance of Early Childhood Care and Development (ECCD) and Education in Sri Lanka has been recognized. There are policies formulated for many aspects including education, care and development of children. Yet, the policies regarding the care, education and development of the children who are under the age five have received less focus. Even though there are available policies, they contain ambiguities and depict shortcomings in the planning process of the policies. The study titled *A Critical Evaluation of the Ownership and Responsibilities of Early Childhood Care, Development and Education in Sri Lanka*, uses available policy documents and tries to critically evaluate the shortcomings and ambiguities in the policies. Furthermore, it presents the limitations in the policy planning regarding the early childhood care, development, and education in Sri Lanka. The main purpose of the study is to present the discrepancies in these available policies and to present areas in which policies should be more focused and planned.

The editorial team welcomes your suggestions to further improve this journal. We are also looking forward to publishing your current research findings in our next issue.

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Inclusivity and Diversity in ELT Material: Critical Textual Analysis as a Pedagogical Tool

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Abstract

Promoting equity and diversity within the classroom and the wider school culture is often overlooked in most educational contexts. The focus on student diversity is important as teachers need to be able to use classroom instruction and communication to make their classes inclusive for all learners. Yet, how can classrooms be inclusive and safe learning environments that offer all students the space to grow and reach their full potential? How can teachers design and deliver lessons so that all learners feel they belong to the school community? How can teachers help their learners appropriate pedagogical content on their own terms? These are concerns this paper attempts to answer. Focusing on English Language Teaching (ELT) material, it discusses how educational

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discourses in textbooks reproduce inequalities that exist outside of the classroom and how critical discourse analysis (CDA) can be used to deconstructs texts in order to explore ways in which they relate to broader sociopolitical contexts. Drawing on selected tenets of CDA, this study discusses how they can be used as an analytical tool to critically examine the relations between discourse, power, dominance, and social inequality present in textbooks and identify ways in which educators can adapt and appropriate material in ways that help their learners to build on the cultural and linguistic capital they bring with them to the classroom.

Key words: *ELT textbooks, diversity, inclusivity, critical discourse analysis*

Introduction

In any classroom, in any social context, in any part of the world, no two learners are alike. They are culturally, linguistically, and socially different. Their experiences are different and so are their expectations. In addition to personal differences, today's learners live in a world where they are exposed to intensely expanding social and visual media. For them, literacy consists of a diverse range of multimodal literacies, most of which are not included in the school curricula. How are inequalities that exist in the larger society reproduced in textbooks? How do existing school curricula, and more specifically the textbooks, sufficiently address the needs of this diverse community? How can classrooms be made more inclusive? How can teachers be assisted to critically analyze the curricula in ways to help them design lessons that are inclusive and effective? How can teachers make their classrooms inclusive so they can cater to the needs of a diverse student population? This is an even greater challenge for English language teachers as they need to not only introduce their learners to the language and the content but also to help them appropriate the language in their own terms. This paper is a discussion about how social inequities are reproduced in textbooks and how critical discourse analysis

can support educators to read texts and adopt them in ways that help their learners appreciate what they learn.

Social reproduction of texts

Cummins' (2001a, 2001b) "Framework for academic language learning" is based on the premise that in "contexts of cultural, linguistic and economic diversity where social inequality inevitably exists, ... interactions are never neutral: they either challenge the operation of coercive relations of power in the wider society or they reinforce these power relations" (2001a, p. 125). Cummins further asserts that teacher-student interaction must affirm students' cultural, linguistic and personal identities in order to augment the learning process (p. 126). He emphasizes the importance of providing students the opportunity to focus on meaning, language and use in both spoken and written contexts. Activation of learners' prior experiences and background knowledge allows the learners to value their cultures on the one hand, and promote maximum "cognitive engagement" on the other (p. 131). This framework is important in understanding to what extent materials presented in the text and the activities that accompany them take into consideration the actual socio-political realities the students encounter everyday. Cummins' model emphasizes how important it is for teachers and school authorities to be sensitive to the needs of the ever increasing diversity of the student population. He is not alone in suggesting that it is time that schools change to address the needs of the students. Delpit (1988) argues that,

Children have the right to their own language, their own culture. We must fight the system by insisting that children be allowed to express themselves in their own language styles. It's not they, the children, who must change, but the schools. To push children to do anything else is repressive and reactionary (p. 291).

These views throw light on teacher education, curriculum design and material development. They also call for the need to employ critical approaches to language teaching and learning that attempt to link language learning to social change.

As Bourdieu (2000) discusses, the production and the reproduction of legitimate language is one of the functions of education. What counts as legitimate language is a product of social evaluation. Education evaluates forms of language (dialects, accents) and what is posited as the legitimate language is determined by the linguistic market, which is a reflection of dominant social relations in society in general. He argues that all linguistic practices are measured against what is considered to be “legitimate practices” or practices of those who are dominant. He argues:

The dominant competence functions as a linguistic capital, securing a profit of distinction in its relation to other competencies only in so far as certain conditions (the unification of the market and the unequal distribution of the chances of access to the means of production of legitimate competence, and to legitimate places of expression) are continuously fulfilled, so that the groups that possess that competence are able to impose it as the only legitimate one in the formal markets (the fashionable, educational, political and administrative markets) and in most of the linguistic interactions that are involved in. (p. 475)

For example, textbooks are an integral part of education, therefore, the language and the information reproduced in them are those of the dominant social groups. Especially in educational contexts where the students use the textbooks to prepare for standardized high stake examination, what counts as legitimate language is the language that is present in the textbooks. Although this language and the content in textbooks might be familiar to students from dominant and elite social groups, it might be very distant to minority learners and learners from disadvantaged backgrounds.

In his discussion about forms of capital, Bourdieu (1986) argues that each individual possesses different types of capital, and that this capital has different values in different contexts. He defines cultural capital as:

... a theoretical hypothesis which made it possible to explain the unequal scholastic achievement of children originating

from different social classes by relating academic success, i.e., the specific profits which children from the different classes and class fractions can obtain in the academic market, the distribution of cultural capital between the classes and class fractions (p. 243).

One of the forms of cultural capital is “embodied cultural capital” or the *habitus* one internalizes through socialization and education. This includes attitudes, habits, dispositions, etc. However, none of these forms of capital will be valued unless they are acknowledged as having legitimacy. For instance, learners from English speaking backgrounds or those with more exposure to the language and more importantly those who speak a standard variety of English would have the linguistic capital to succeed in school. This linguistic capital can later be turned into economic capital in the form of access to better educational and employment opportunities.

Discourse and discrimination

Discourse is often a tool dominant groups and institutions use to discriminate against minority groups. Though it is quite different from physical violence, it is equally painful. Elite discourse may seem harmless, but it has harmful consequences. It is therefore a form of linguistic discrimination. However, it is important to note that this form of discrimination very often takes place at a very symbolic level (Smitherman-Donaldson & van Dijk, 1988). The discourse in textbooks is very much part of the dominant discourse. As van Dijk (1993a) asserts “educational discourse and organizations ... contribute to the reproduction of an ideology that supports the ethnic status quo” (p. 238). School is the context for the “acquisition and confirmation of ethnic and racial beliefs” (p. 198). Textbooks show the perspectives and the interests of the dominant groups. In the absence of alternative modes of influence, textbook discourse plays a crucial role in shaping the world view of young learners. Very often textbooks portray superficial information about minority cultures that obscure the hegemony of the dominant group. Such stereotypical representations affect both the majority and the minority learners. By the time students are in secondary school, they already have some knowledge of

other ethnic groups through, for instance, personal experiences, peers, parents, and the media. Biased representations of diverse communities in textbooks can confirm these stereotypes or prejudices. Moreover, the more subtle and indirect forms of marginalization and inferiorization of minorities in educational discourse establishes more sophisticated beliefs. Though there might not be instances of overt discrimination, the absence of sufficient representation of diverse communities is still discrimination. As van Dijk (1993a) states, it's a form of "symbolic discrimination" (p. 18).

That is why the content as well as the activities in the textbooks should explicitly take into consideration the possible presence of minority learners in the classroom. Textbooks should feature a broad perspective that gives credit to all major ethnic groups in the country and the world. Educational discourses need to aim to develop knowledge and attitudes needed to participate in the overcoming and resisting of various forms of discrimination. Moreover, questioning the characterization, the language, the historical correctness, the cultural authenticity and the illustrations can help in detecting bias in textbooks (van Dijk, 1993a).

Critical Discourse Analysis (CDA)

The approach to critical textual analysis this paper draws on derives from the analytical frameworks of Fairclough (1993) and Pennycook (2001). For Fairclough (1993), the aims of CDA are three-fold: first, to "systematically explore the often opaque relationships of causality and determination" between texts and wider social and cultural structures and relations; second, to investigate how texts are shaped by relations of power and struggles over power. Finally, it explores how power is maintained through the opacity of these relationships between discourse and society (p. 135). Pennycook's (2001) approach to textual analysis attempts to move away from mainstream critical work. Firstly, it is based on the premise that literacy is always political. Secondly, it views texts and literacy practices as located in social contexts. What is meant by context is not just the immediate surroundings,

but more importantly the “historical’ and “discursive” context of texts and the readers. In a society that continues to be overshadowed by its past, a deconstruction of texts would be incomplete if it fails to take into consideration the past. Thirdly, “texts do not mean until they are interpreted” (p. 111), therefore it takes into account text “production” as well as “reception” (p.111). However, Pennycook is careful to point out the necessity of avoiding “an overdetermination by social structure” and “an underdetermination that suggests that texts are simply open to all interpretations” (p. 111). He draws on Hall’s (1994) notion of “preferred meanings” to point out that texts may be interpreted, negotiated, or contested in keeping with these preferred or dominant meanings. Though this might not necessarily provide an answer to the meaning of the text, it would allow the reader to map out different meanings that can be located in the text (Pennycook, 2001).

Some cornerstones of CDA that lends itself to textual analysis are discussed below.

Discourse in CDA

A discussion of CDA should begin with a definition of discourse proper. It is a term that is used differently in different disciplines and by different researchers. In the English speaking world discourse is used to refer to both spoken and written texts (Weiss & Wodak, 2003). Fairclough (1993) extends this definition to include “semiotic practice in other semiotic modalities such as photography and non-verbal (e.g. gestural) communication” (p. 134). McLaren (1989) refers to discursive practices as the “rules by which discourses are formed, rules that govern what can be said and what must remain unsaid, who can speak with authority and who must listen” (p. 180). Educational institutions such as schools are governed by discursive practices.

For Fairclough (1992), discourse is a political and ideological practice. As a political practice discourse “establishes, sustains and changes power relations, and the collective entities ... between which power relations obtain” (p. 67). And, as an ideological

practice discourse “constitutes, naturalizes, sustains and changes significations of the world from diverse positions in power relations” (p. 67). Such a twofold view of discourse is important in understanding how educational discourse in English textbooks presents and naturalizes certain experiences as common realities. This view also helps in understanding what realities and experiences the texts promote.

Discourse, therefore, is socially constitutive and constituted. It creates situations, knowledge, and social identities and relationships between people. It is discourse that helps to reproduce and sustain the status quo, which inevitably associates discourse with power. The ideological effects of powerful discursive practices can produce unequal power relations in society. However, for CDA, discourse by itself is not powerful; but, it gains power by the use of powerful people (Weiss & Wodak, 2003). As Hall (1994) asserts, it is the dominant discourses or the discourses that have the “stamp of truth” that constitute knowledge. Information presented in textbooks are examples of dominant discourses that carry the “stamp of truth” for students preparing for standardized exams and as such they have a tendency to accept and internalize the textbook content as the truth. Moreover, the educational and the social backgrounds of the authors would shape what is included and excluded from the text. However, this does not mean that learners and teachers alike are only influenced by textbook discourse; they also have the power to influence or resist the discourse in return.

“Technologization” of Discourse

“Technologization” of language is a striking feature of contemporary society (Fairclough, 1992). It is experienced in the form of “top-down imposition of new discursive practices by organizations upon their members” (Fairclough, 1993, p. 141). These top-down forms of imposition could include the media, the demands of the corporate sector etc. As Fairclough (1992) discusses, one example of the technologization of discourse is the emphasis on spoken language skills within language education. This demand is a result of the changing nature of the demands of

the world of work. Technologization affects not only language, but also non-verbal communication as well as images. Fairclough (1992) discusses the importance of developing critical awareness in language teaching in such a context. He argues,

If power relations are indeed increasingly coming to be exercised implicitly in language, and if language practices are indeed coming to be consciously controlled and inculcated, then a linguistics which contents itself with describing language practices without trying to explain them, and relate them to the social and power relations which underlie them, seem to be missing an important point (p. 6).

He asserts that a critical consciousness is crucial in being an effective citizen in a democratic society.

Ideology

Ideology is another cornerstone of CDA that needs to be defined. Thompson (1990) points out that the term ideology originated in eighteenth century France, and since then has been given different functions and meanings over time. "Ideology, for CDA, is seen as an important means of establishing and maintaining unequal relations of power" (Weiss & Wodak, 2003). Cortazzi and Jin (1999) view textbooks as ideology. For them, textbooks "reflect a worldview or cultural system, a social construction that may be imposed on teachers and students and that indirectly constructs their view of a culture" (p. 200). They argue that this aspect in textbooks very often goes unrecognized. The interest-based perspective can be revealed through questions as "In whose interest is this text written and why?" (p. 200). The country in which the textbook was published, commercial interests, and the views or interests of decision makers who choose a book can play an important role in the cultural content of the textbooks. Or, as discussed in de Castell, Luke and Luke (1989) and Apple and Christian-Smith (1991) textbooks can function as a form of cultural politics by inclusion or exclusion of certain socio-political, cultural, or economic realities.

Power and cognition

At the heart of any critical approach to language teaching and learning are notions of power and how power is reproduced through texts. According to van Dijk (1993b), there is a cognitive dimension to power, where discourse, beliefs, ideologies, and attitudes are “managed” to reflect particular dominant discourses and ideologies. van Dijk terms these modes of access to the social reality “social cognitions”; and, the social cognitions that “reflect the basic aims, interests and values of groups” are ideologies (p. 258). The values and interests the educational discourse promote are often shaped by the writers’ own sociopolitical affiliations. The authors of the textbooks have the power to shape the textbook content to a degree and in conformity to dominant educational standards and agendas. This is based on Foucault’s (1989) notion that power operates throughout society in both micro and macro settings and that it should not be viewed only as necessarily adverse or restrictive, but as something that also creates opportunities for resistance or transformation (Pennycook, 2001).

The resistance and the questioning of the educational discourse presented in textbooks would not take place if power ceased to exist. Therefore, power should be viewed as productive rather than solely restrictive or repressive. Foucault’s notions of power are pertinent to the ideological deconstruction of textbooks. It does not view readers as passive recipients who are being controlled and determined by presentations in the text or are participants in what Freire (2000) called “banking education” but rather as active co-constructors of meaning.

Intertextuality

Pennycook (2001) discusses the importance of intertextuality or the manner in which discourses are constructed through intertextual relations. According to Bazerman (2004) all texts are created from a “sea” of former texts. We have seen or heard most of the words and phrases that we use; and, we understand texts that are within that textual “sea”. Intertextuality describes how certain genres of discourse might borrow style and content from other genres (Cameron, 2001). All textbooks, and ELT textbooks

more so, draw on excerpts from fictional and non-fictional books and other forms of literature, newspaper articles, advertisements, various documents used in the corporate sector etc.

"Inclusivity" and "Inappropriacy"

Gray (2002) in his study about global textbooks identifies similarities in the content of ELT textbooks published for the global market. This is due to the fact that publishers provide textbook writers guidelines as to what needs to be included and excluded in text. This includes inclusivity which refers to the non-sexist way men and women are portrayed in the text and "inappropriacy" which refers to the avoidance of certain topics that might offend the buyer. One of the main reasons these books follow these guidelines is to ensure that there is a wider global market.

Under the headings "Images of women" and "Women in language" the "inclusivity" guidelines clearly states how women should be represented and how sexist language should be avoided. This includes artwork, names in exercises, voices in tapes, videos, avoiding stereotyping etc. Going hand in hand with "inclusivity" is "inappropriacy", or topics that should be avoided. "Some publishers provide lists of proscribed topics, while others rely informally on the acronym PARSNIP (politics, alcohol, religion, sex, narcotics, isms and pork) as a rule of the thumb" (Gray, 2002, p. 159). Gray notes that ELT textbook are beginning to look more alike and are stripped of any distinctive cultural characteristics.

Visual literacy in ELT textbooks

A critical textual analysis is incomplete if it does not take into account visual literacies. Fairclough's (1993) definition of discourse is extended to semiotic practices such as photographs. A critical discourse analysis of ELT textbooks need to focus on the written discourse as well as the visual representations such as photographs, cartoons, clip-arts and other forms of drawings. As Klein (1985) asserts, "Not only do words reflect bias-so too do the pictures in books. And they do it at the flick of a page, confirming an image in the mind or flashing a new one" (p. 7). While images could be very effective in the teaching of any language, they could

have a greater impact on the learners than the written discourse. Corbett (2003) discusses how visuals can be exploited for their cultural significance as well as their language learning potential. Exploration of images produced by different cultures can be exploited to enhance understanding of other social and ethnic groups.

According to Kress and van Leeuwen (1996), visual images are a way of sending messages. While there are inherent differences between the visual images and verbal messages, images could be analyzed along linguistic lines:

What in language is realized by locative prepositions, is realized in pictures by the formal characteristics that create the contrast between the foreground and background. This is not to say that all the relations that can be realized in language can also be realized in pictures, or vice versa, that all the relations that can be realized in the pictures can also be realized in language. Rather, a given culture has a range of general, possible relations which is not tied to expression in any particular semiotic code, although some relations can only be realized in the pictures, and other only in words, or some more easily in pictures and other more easily in words. (p. 142)

Corbett (2003) argues that visual images have a “vocabulary” and a “grammar”. The vocabulary consists of the content of the picture. These pictures, like vocabulary will have denotational and connotational meanings. These meanings are culturally situated and can be compared and contrasted across different contexts. The “grammar” of the image is the relationship between those people or objects represented by the image. Corbett (2003) categorizes images as narrative (transitive) images in which the characters act upon each other in some way, and descriptive (intransitive) images, in which a character or a set of characters are simply described.

Corbett (2003) also discusses the visual significance of the English language. On the one hand, in former colonies, English is still perceived as the language of the colonizer and it is the language of

the elite. On the other hand, English is the language of global economic, political and technological power (Crystal, 1997). Against such a backdrop, an analysis of visuals would assist in understanding the extent to which the textbooks attempt to bridge or separate local learners.

Standard language ideology

A deconstruction of textbooks is incomplete if it does not touch on standard language and language standards. However arbitrary the notion of 'standards' is, standards do exist, and it is standards that function as gatekeepers to employment, higher education, social mobility or even ones personal life. Jenkins (2003) defines a standard language as,

... a term used for the variety of language which is considered to be the norm. It is the variety held up as the optimum for educational purposes and used as a yardstick against which other varieties of the language are measured. Being a **prestige variety**, a standard variety is spoken by a minority of people within a society, typically those occupying positions of power. (p. 29) (emphasis in the original)

Language standards "are prescriptive language rules which together constitute the standard and which to all members of the community are exposed and urged to conform during education, regardless of the local variety" (Jenkins, 2003, p. 29). Parakrama (1995) while critiquing the arbitrary nature of language standards argues that language standards do not favor those who speak new varieties of English.

What is considered to be the standard variety of English in Sri Lanka clearly falls into the description given by Jenkins. According to Guneseckera (2005) "the English used by the Sri Lankan elite is Standard Sri Lankan English (SLE), which is part and parcel of belonging to the 'English speaking' class" (p. 24). Therefore, what is considered to be the standard variety of SLE is a variety used by an exclusive minority. All these findings reveal the importance of

speaking a standard variety of English, however arbitrary it might be.

Advocates of critical pedagogies such as Pennycook (2001) and Canagarajah (1993) critique the notion of prescribing standard language in ELT. They argue that the learners should be allowed to bring in their own varieties of English to the class. However liberal these ideas may be, success in language learning is very much shaped by how well one communicates in the standard variety. Especially in contexts where learners face highly competitive standardized examinations, it is important to teach them the standard variety of English. Very often the only time a learner might have access to a standard variety of English would be in school. If the varieties used by learners are considered to be sub-standard varieties, which, when spoken in society will marginalize them, it is crucial that textbooks and classroom instruction promote standard varieties.

Parakrama (1995), who accepts the importance of standards, advocates the importance of broadening them. Broadening the standards is a means through which English could be made a more inclusive language. However, the attitudes towards English of those who speak English and those who do not are so deeply rooted that the acceptance of broader standards is going to be a slow and lengthy process. Corson (1999) asserts that “a myriad of language varieties exist everywhere ... without people having much awareness of them at all” (p. 148). He believes that educators need to promote critical awareness of varieties. In his discussion about CLA in school and curriculum, he states that the teachers need to create the space for discussion about what counts as prestigious language for them and what varieties don’t. It starts by ‘asking children if they knew the reasons for their biases’ (p. 150) about language. “Whole-class discussions” could help students to reject reasons for prejudice and instead “focus on reasons to do with social power and with historical events” (p. 150). Marginalized discourse varieties should not remain marginalized or discarded along with foreign varieties. Learners should be encouraged to draw on these varieties for meaning making and understanding

the larger structures of power. Taking a similar line of arguments as Delpit (1995), Cope and Kalantzis (1993) argue that disadvantaged learners need explicit instruction in the standard forms of language.

Cultural reflections in ELT materials

A textual analysis also needs to be concerned with how cultures are defined and reproduced for readers. The term culture has different meanings. Cortazzi and Jin (1999) view culture as “a framework of assumptions, ideas, and beliefs that are used to interpret other people’s actions, words and patterns of thinking” (p. 196). Although the manner in which one views another culture is very subjective, it is important to make language learners aware of the different cultural frameworks. As Cortazzi & Jin (1999) point out,

...it is crucial that foreign language learners should become aware of differing cultural frameworks, both their own and those of others; otherwise they will use their own cultural system to interpret the target-language messages whose intended meaning may well be predicted on quite different cultural assumptions (p. 197).

What is important to note in the theory on EFL material development and intercultural competence is the manner in which culture is compartmentalized as ‘source culture’ or the learners’ own culture and ‘target culture’ or the culture in which the target language is used as the first language (Alptekin, 1993; Cortazzi & Jin, 1999; Sheldon, 1998). This dichotomy does not necessarily apply to the Sri Lankan situation. However, what is said about developing intercultural competence can be applied to developing awareness and cultural competence about the various local cultures.

Intercultural competence, according to Meyer (1991) is the ability of a person to be flexible when confronted with actions, attitudes and expectations that are representative of another culture but also to see one’s own culture in a new or ‘strange’ way (Cortazzi & Jin, 1999). Therefore, ELT materials should reflect a range of

cultural contexts that include intercultural elements and should raise the learners' intercultural awareness. Otherwise the learners will be lead to believe in a unified, monolithic culture. There should be variation in terms of intra-cultural and inter-cultural elements. Intercultural competence takes place in situations which demand the learners to negotiate the meaning and identity with the author of the textbook and the cultural content. Cortazzi and Jin view learning culture as a dialogue between the teacher, the students and the textbook. Neither the students nor the teachers are blank slates; they will bring some cultural knowledge to the discussion. Moreover, the manner in which the teacher interprets and teaches culture would be shaped by his/her own education. They discuss the importance of using a textbook evaluation checklist that focuses on the cultural content of textbooks (Cortazzi & Jin, 1999).

Conclusion

Textbookes used in schools are conceived and designed by people with interests and they are often a reproduction of social realities that are close to the lives of priviledged communities. Yet, in educational contexts in which student success is measured through standardized examinations, textbooks and their contents become realities that learners internalize and reproduce at exams. This paper is a critical discussion of how larger social realities are reproduced in educational resources and how CDA can be an analytical tool that helps teachers to scrutinize textbooks and rethink instruction in ways that help all learners to fully engage in the teaching-learning process irrespective of their sociocultural backgrounds.

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Synthesis of Cyclometallated Pt(II) Complexes of a Bulky Bipyridine Ligand

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Abstract

Treatment of 3,4,5,6-tetraphenyl-2,2'-bipyridine (LH) (**7**) with $[\text{PtCl}_2(\text{dmsO})_2]$ (dmsO = dimethyl sulfoxide) in chloroform afforded the cyclometallated square-planar platinum(II) complex $[\text{PtCl}(\text{L})]$ (**8**) and the octahedral Pt(IV) complex *mer*- $[\text{PtCl}_3(\text{L})]$ (**9**) containing an anionic tridentate ($\text{C}^{\wedge}\text{N}^{\wedge}\text{N}$) ligand. The chloride of (**8**) can be easily replaced by trifluoroacetate to yield $[(\text{L})\text{PtO}_2\text{CCF}_3]$ (**10**). Reaction of (**8**) with the alkyne $\text{HC}\equiv\text{CC}_6\text{H}_4\text{Bu}^t\text{-4}$ resulted in the formation of $[(\text{L})\text{PtC}\equiv\text{CC}_6\text{H}_4\text{Bu}^t\text{-4}]$ (**11**). Treatment of (**8**) with 4-dimethylamino-pyridine (DMAP) and PPh_3 in dichloromethane, and the subsequent addition of NH_4PF_6 in methanol produced the salts $[\text{Pt}(\text{DMAP})(\text{L})]\text{PF}_6$ (**12**) and $[\text{Pt}(\text{PPh}_3)(\text{L})]\text{PF}_6$ (**13**), respectively. In a similar manner, reaction of (**8**) with 0.5 equiv. of bis(diphenyl-phosphino)methane

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(dppm) formed the dppm-bridged binuclear dicationic salt [(L)Pt(μ -dppm)Pt(L)][PF₆]₂ (**14**).

Keywords: Pt(II) complexes, cyclometallation, bipyridine, acetylides, bridging complexes

Introduction

Interest on cyclometallated complexes of the type (C[^]N)M, (N[^]C[^]N)M and (C[^]N[^]N)M of platinum, ruthenium and iridium has risen recently as they are capable of harvesting light (Balzani & Campagna, 2007). Cyclometallated platinum(II) complexes containing a bidentate unit (C[^]N)Pt (Nikolaeva & Puzyk, 2013; Murphy, *et al.*, 2012; Shafikov, 2019), tridentate units (N[^]C[^]N)Pt (Murphy, *et al.*, 2012; Colombo, *et al.*, 2015; Williams, *et al.*, 2003) and (C[^]N[^]N)Pt (Tsai, *et al.*, 2015; Fung, *et al.*, 2016; Feng, *et al.*, 2006; Shao, *et al.*, 2008; Lu, *et al.*, 2004; Nolan, *et al.*, 2013) are derived from aromatic N-donor ligands which display a variety of emissive excited states, including ligand-to-metal and metal-to-ligand charge transfers. Phosphorescent Pt(II) complexes possess many advantages such as a wide emission colour tunability, a better stability towards photo and chemical degradation, a very large stokes shift, and long-lived luminescent excited states (Colombo, *et al.*, 2015). The relative energy of these excited states is strongly affected by the groups attached to these ligands and the other auxiliary ligand bonded to the Pt(II) centre. Some of the basic and well-studied ligand types are given in Figure 1; **I** (Nikolaeva & Puzyk, 2013; Murphy, *et al.*, 2012); **II** (Nikolaeva & Puzyk, 2013); **III** (Shafikov, 2019); **IV** (Shafikov, 2019); **V** (Murphy, *et al.*, 2012; Colombo, *et al.*, 2015; Williams, *et al.*, 2003); **VI** (Fung, *et al.*, 2016; Feng, *et al.*, 2006; Shao, *et al.*, 2008; Lu, *et al.*, 2004; Nolan, *et al.*, 2013); and **VII** (Tsai, *et al.*, 2015).

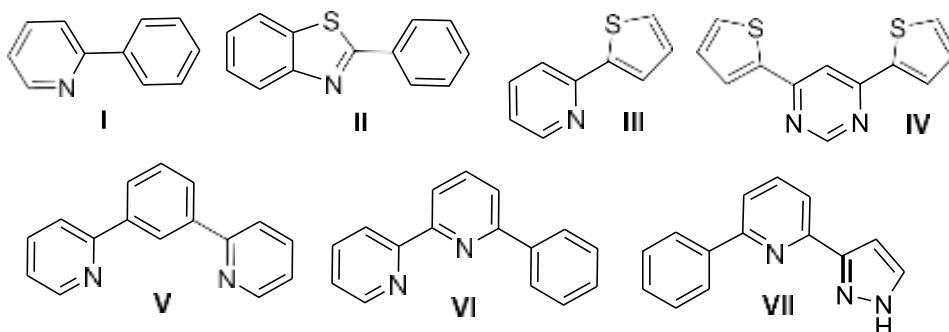


Figure 1. Molecular structures of ligands **I – VII**

The cyclometallated platinum(II) complexes of the type $[\text{Pt}(\text{NH}_3)_2(\text{C}^{\wedge}\text{N})]\text{ClO}_4$ (**1**), where $\text{C}^{\wedge}\text{N}$ is a 2-phenylbenzothiazole ion showed intense long-lived luminescence (Figure 2) (Nikolaeva & Puzyk, 2013). Williams *et al.* showed that tridentate $(\text{N}^{\wedge}\text{C}^{\wedge}\text{N})\text{Pt}(\text{II})$ complex (**4**) has slightly superior luminescence quantum yield when compared to that of the bidentate $(\text{N}^{\wedge}\text{C})\text{Pt}(\text{II})$ complex (**2**) (Murphy, *et al.*, 2012).

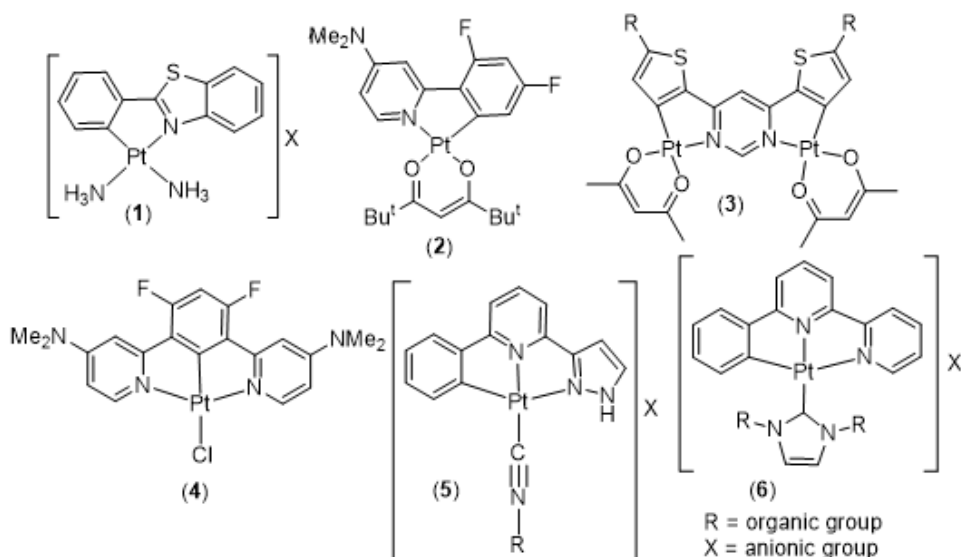


Figure 2. Molecular structures of cyclometallated Pt(II) complexes (**1**) - (**6**)

The binuclear cyclometallated complex (**3**) of a substituted 4,6-bis(2-thienyl)pyrimidine emits in the red region of the spectrum ($\lambda_{\text{max}} = 610 \text{ nm}$, $\Phi = 0.85$ in deoxygenated dichloromethane at 300 K). Colombo *et al.* described the synthesis of neutral tridentate ($\text{N}^{\wedge}\text{C}^{\wedge}\text{N}$)Pt(II) complexes as long-lived bio-imaging probes bearing hydrophilic ethylene glycol chains to increase the water solubility and bio-compatibility. The luminescent complexes of type (**5**) display self-assembly and anti-cancer properties and exert cytotoxicity towards different immortalized cancer cells and primary cells (Tsai, *et al.*, 2015). The Pt(II) complexes of the type $[\text{Pt}(\text{C}^{\wedge}\text{N}^{\wedge}\text{N})(\text{NHC})]\text{O}_3\text{SCF}_3$ (**6**) (NHC = N-heterocyclic carbene) showed up to 15-fold higher emission intensities upon binding to mismatched DNA over matched DNA, and can be utilized for both detecting DNA abasic sites and identifying cancer cells (Fung, *et al.*, 2016). The photo-physical and third-order nonlinear optical properties of cyclometallated (4,6-diphenyl-2,2'-bipyridyl pentynyl)platinum(II) complex have been investigated (Shao, *et al.*, 2008). Based on their systematic studies, Lu *et al.* suggest that tridentate cyclometallated ($\text{C}^{\wedge}\text{N}^{\wedge}\text{N}$)Pt(II) σ -alkynyl complexes are promising light-emitting materials, especially as phosphorescent dopants for OLED applications, due to their intense, readily-adjustable triplet emissions under ambient conditions and their thermal stability (Lu, *et al.*, 2004).

Synthesis of the pyridyl-centred polyphenylene (**7**) (see Scheme 1) and its coordination chemistry particularly with rhodium and palladium have been reported (Ollangnier, *et al.*, 2008; Perera & Draper, 2009; Perera, 2018). It is of interest to explore the chemistry of this pyridyl-centred polyphenylene ligand (**7**) with platinum centres in order to prepare possible photoactive luminescent complexes of the type $[(\text{C}^{\wedge}\text{N}^{\wedge}\text{N})\text{PtX}]$ (X = halide, trifluoroacetate, acetylides), $[(\text{C}^{\wedge}\text{N}^{\wedge}\text{N})\text{Pt}(\text{L}')]\text{PF}_6$ (L' = pyridine or phosphine) and a binuclear complex containing bridging ligands. In this paper we report studies carried out to devise synthetic routes to such complexes.

Methodology

All the experiments were carried out in an inert atmosphere (dinitrogen or argon). Elemental analyses were carried out on a Carlo Erba 1006 automatic analyser. IR spectra were recorded on a PerkinElmer Spectrum One FT-IR spectrometer fitted with a universal ATR sampling accessory. Mass spectral data were obtained using a micromass LCT electrospray mass spectrometer. NMR spectra were recorded on a Bruker DPX 400 spectrometer (operating frequencies for ^1H and ^{13}C are 400.13 and 100.62 MHz, respectively) or Bruker Avance Π 600 spectrometer (operating frequencies for ^1H and ^{13}C are 600.13 and 150.9 MHz). ^1H and ^{13}C chemical shifts (δ) are in ppm with respect to TMS, and coupling constants (J) are in Hz. Single-crystal analyses were performed on a Bruker SMART APEX CCD diffractometer using graphite monochromised Mo-K α ($\lambda=0.71073\text{\AA}$) radiation and refinements were obtained using SHELXS software. Figures 3 and 4 feature the images obtained by using Mercury software. 3,4,5,6-Tetraphenyl-2,2'-bipyridine (**7**) was prepared according to a procedure recorded in relevant literature (Ollangnier, *et al.*, 2008).

[PtCl(L)] (**8**) and *mer*-[PtCl $_3$ (L)] (**9**)

Suspension of the ligand (**7**) (60 mg, 0.13 mmol) and [PtCl $_2$ (dms $_2$) $_2$] (55 mg, 0.13 mmol) in chloroform (12 mL) was refluxed for 24 h to give an orange precipitate. The solution was concentrated (*ca.* 1.5 mL) and methanol (*ca.* 0.5 mL) was added. The orange precipitate [PtCl(L)] (**8**) was filtered off and washed with methanol (68 mg, 76%). Upon standing, the mother liquor gave yellow crystals of *mer*-[PtCl $_3$ (L)] (**9**) (16 mg, 16%).

[PtCl(L)] (**8**)

Found: C, 58.23; H, 3.31; N 3.74, calcd. (%) for C $_{34}$ H $_{23}$ ClN $_2$ Pt·0.1CHCl $_3$: C, 58.34; H, 3.31; N 3.99. IR (neat, ν , cm $^{-1}$): 3059, 1597, 1575, 1466, 1406, 755, 727 and 701. ^1H NMR (400 MHz, CDCl $_3$): δ 9.37 (m, 1H, H 6), 8.02 (d, 1H, $^3\text{J}(\text{HH})$ 7.8 Hz, H 8), 7.55-7.50 (m, 2H, H 5 & H 4), 7.3-7.2 (m, 7H, H $^{\text{Ph}}$ & H 9), 7.13-7.06 (m, 4H, H $^{\text{Ph}}$), 6.95-6.91 (m, 3H, H $^{\text{Ph}}$), 6.74-6.69 (m, 2H, H $^{\text{Ph}}$), 6.61-6.57 (m, 2H, H 3 and H 10) and 6.02 (d, 1H, $^3\text{J}(\text{HH})$ 7.8 Hz, H 11). ^{13}C NMR

was not recorded as (**8**) is not very soluble in most of the deuterated solvents.

mer-[PtCl₃(L)] (9**)**

Found: C, 52.65; H, 3.03; N 3.24, calcd. (%) for C₃₄H₂₃Cl₃N₂Pt·0.1CHCl₃: C, 52.98; H, 3.01; N 3.63. IR (neat, ν , cm⁻¹): 3006, 1598, 1576, 1470, 1442, 1407, 1276, 1261, 764, 751 and 700. ¹H NMR (400 MHz, CDCl₃): δ 9.51 (m, 1H, H⁶), 8.02 (dd, 1H, ³J(HH) 7.5 Hz, ⁴J(HH) 1.0 Hz, H⁸), 7.69-7.66 (m, 1H, H⁵, overlaps with H⁴), 7.64 (dt, 1H, ³J(HH) 8.0 Hz, ⁴J(HH) 2.0 Hz, H⁴), 7.37-7.30 (m, 6H, H^{Ph}), 7.26 (dt, 1H, ³J(HH) 8.0 Hz, ⁴J(HH) 1.5 Hz, H⁹), 7.17-7.14 (m, 4H, H^{Ph}), 7.00-6.97 (m, 3H, H^{Ph}), 6.84 (dd, 1H, ³J(HH) 8.0 Hz, ⁴J(HH) 1.0 Hz, H³), 6.77-6.70 (m, 3H, H^{Ph} and H¹⁰) and 6.20 (dd, 1H, ³J(HH) 8.5 Hz, ⁴J(HH) 1.5 Hz, H¹¹). ¹³C NMR: δ 148.6 (C⁶), 139.0 (C⁴), 132.4 (C⁹), 132.1 (C⁸), 130.4 (C¹¹), 129.3 (C^{Ph}), 129.1 (C^{Ph}), 129.0 (C^{Ph}), 128.8 (C^{Ph}), 128.5 (C^{Ph}), 128.4 (C^{Ph}), 128.1 (C³), 127.0 (C^{Ph}), 126.9 (C⁵) and 125.3 (C¹⁰).

[PtCl(L)] (8**)**

Suspension of the ligand (**7**) (60 mg, 0.13 mmol), [PtCl₂(dmsO)₂] (55 mg, 0.13 mmol) and triethylamine (36 mg, 0.36 mmol) in chloroform (12 mL) was refluxed for 20 h to give an orange precipitate. The solution was concentrated (ca. 1.5 mL) and the orange precipitate [PtCl(L)] was filtered off and washed with methanol (83 mg, 92%). The characterizing data as same as above.

[Pt(O₂CCF₃)(L)] (10**)**

Into a warm suspension of [PtCl(L)] (**8**) (30 mg, 0.043 mmol) in dichloromethane (4 mL) was added a solution of silver trifluoroacetate (AgO₂CCF₃) (11 mg, 0.049 mmol) in methanol (2 mL). Reaction mixture was stirred at room temperature for 24 h. The solvent was removed, and the residue was extracted with dichloromethane. The combined extract was concentrated to a low volume and methanol was added to give a red solid (31 mg, 93%). Found: C, 56.05; H, 2.95; N 3.25, calcd. (%) for C₃₆H₂₃F₃N₂O₂Pt: C, 56.33; H, 3.02; N 3.65. IR (neat, ν , cm⁻¹): 1697, 1576, 1545, 1470, 1444, 1405, 1190, 1135, 1031, 808, 784, 770, 745, 727 and 699. MS (*m/z*-MALDI-TOF, CH₂Cl₂): found: 654.1526; calcd. 654.1509

for $C_{34}H_{23}N_2Pt$, $[M-O_2CCF_3]^+$. 1H NMR (400 MHz, CD_3CN): δ 8.81 (br, d, 1H, $^3J(HH)$ 4.5 Hz, H^6), 7.79 (t, 1H, $^3J(HH)$ 7.8 Hz, H^4), 7.68 (m, 1H, H^5), 7.42-7.25 (m, 7H, H^{Ph} and H^8), 7.23-7.13 (m, 4H, H^{Ph}), 7.10 (m, 1H, H^9), 7.01-6.91 (m, 3H, H^{Ph}), 6.90-6.80 (m, 2H, H^{Ph}), 6.69 (t, 1H, $^3J(HH)$ 7.8 Hz, H^{10}), 6.63 (d, 1H, $^3J(HH)$ 7.8 Hz, H^3) and 5.94 (d, 1H, $^3J(HH)$ 7.8 Hz, H^{11}). ^{13}C NMR (100.6 MHz; CD_3CN , δ_c): 163.6, 157.1, 156.8, 152.6, 150.0 (C^6), 147.9, 142.0, 140.4 (C^4), 136.2, 136.1 (C^8), 136.0, 135.5, 135.0, 133.7 (C^9), 130.7 (C^{11}), 129.6 (C^{Ph}), 129.5 (C^{Ph}), 129.3 (C^{Ph}), 129.2 (C^{Ph}), 128.8 (C^{Ph}), 128.4 (C^{Ph}), 128.0 ($C^{3/Ph}$), 127.8 ($C^{3/Ph}$), 127.0 (C^{Ph}), 126.9 (C^5) and 124.9 (C^{10}). ^{19}F NMR (376.5 MHz, $CDCl_3$): -75.6 (s) ppm.

[Pt($C\equiv CC_6H_4Bu^t$)(L)] (11)

To a degassed solution containing $[PtCl(L)]$ (**8**) (25 mg, 0.036 mmol), 4-*tert*-butylphenyl acetylene (30 mg, 0.19 mmol) and triethyl amine (0.5 mL) in dichloromethane (5 mL), CuI (1 mg, 0.005 mmol) was added. The platinum complex went into solution gradually to give a red solution and the reaction mixture was stirred under dinitrogen for 24 h. It was concentrated upon a low volume and methanol was added to give the required product as an orange solid (24 mg, 83%). Found: C, 67.90; H, 4.35; N 3.15, calcd. (%) for $C_{46}H_{36}N_2Pt$: C, 68.05; H, 4.47; N 3.45. IR (neat, cm^{-1}): 3039, 2964, 2099, 1599, 1575, 1498, 1467, 1442, 1403, 1267, 1107, 1013, 833, 759, 729 and 699. MS (m/z -MALDI-TOF, CH_2Cl_2): found: 811.2547; calcd. 811.2526 for $C_{46}H_{36}N_2Pt$, $[M]^+$. 1H NMR ($CDCl_3$): δ 9.42 (d, 1H, $^3J(HH)$ 4.0 Hz, H^6), 8.08 (d, 1H, $^3J(HH)$ 7.0 Hz, $^3J(PtH)$ 58 Hz, H^8), 7.65-7.47 (m, 3H, $^3J(HH)$ 7.8 Hz, H^{Ar} and H^4), 7.44-7.32 (m, 3H, $^3J(HH)$ 7.8 Hz, H^{Ar} and H^5), 7.31-7.21 (m, 7H, H^{Ph}), 7.16-7.06 (m, 3H, H^{Ph}), 7.06-6.98 (m, 1H, H^9), 6.97-6.86 (m, 3H, H^{Ph}), 6.82-6.67 (m, 2H, H^{Ph}), 6.65-6.51 (m, 2H, H^3 and H^{10}), 6.09 (br, d, 1H, $^3J(HH)$ 7.8 Hz, H^{11}) and 1.36 (s, 9H, CMe_3). ^{13}C NMR (100.6 MHz; $CDCl_3$, δ_c): 148.0 (C^6), 138.4 (C^8), 137.6 (C^4), 130.8 (C^9), 129.8 (C^{Ar}), 129.7 (C^{Ph}), 129.6 (C^{Ph}), 129.3 (C^{11}), 129.2 (C^{Ph}), 128.6 (C^{Ph}), 128.4 (C^{Ph}), 127.9 (C^{Ph}), 127.1 (C^{Ph}), 126.9 (C^3), 126.8 (C^5), 126.7 (C^{Ph}), 125.3 (C^{Ph}), 124.9 (C^{Ar}), 123.1 (C^{10}) and 31.4 (CMe_3).

[Pt(L)(DMAP)]PF₆ (12)

To a suspension containing [PtCl(L)] (**8**) (20 mg, 0.0289 mmol) and 4-dimethylaminopyridine (DMAP) (10 mg, 0.082 mmol) in chloroform (3 mL) a solution of NH₄PF₆ (12 mg, 0.073 mmol) in methanol (1 mL) was added. The reaction mixture was refluxed for 1 h to give a yellow solution which was concentrated to give the required product as a yellow solid (22 mg, 81%). Found: C, 51.91; H, 3.71; N 5.68, calcd. (%) for C₄₁H₃₃N₄PF₆Pt·0.25CHCl₃: C, 52.06; H, 3.52; N 5.88. IR (neat, ν , cm⁻¹): 2961, 1623, 1546, 1396, 835, 771 and 700. ESI-MS (acetone, m/z): found: 776.2342; calcd. 776.2353 for C₄₁H₃₃N₄Pt, [M-PF₆]⁺. ¹H-NMR (400 MHz, CDCl₃, δ in ppm): 8.34 (d, 2H, ³J(HH) 7.0 Hz, ³J(PtH) 36 Hz, H^{Ar}), 8.20 (d, 1H, ³J(HH) 4.5 Hz, H⁶), 7.75 (m, 1H, ³J(HH) 7.0 Hz, H⁵), 7.61 (dt, 1H, ³J(HH) 8.0 Hz, ⁴J(HH) 1.5 Hz, H⁴), 7.32-7.28 (m, 6H, H^{Ph}), 7.12-7.08 (m, 4H, H^{Ph}), 7.01-6.95 (m, 4H, ³J(HH) 7.5 Hz, H^{Ph} & H⁹), 6.79 (d, 2H, ³J(HH) 7.0 Hz, H^{Ar}), 6.72-6.70 (m, 2H, H^{Ph}), 6.66-6.62 (m, 3H, H³, H⁸ & H¹⁰), 6.10 (d, 1H, ³J(HH) 8.0 Hz, H¹¹) and 3.25 (s, 6H, Me). ¹³C NMR (100.6 MHz; CDCl₃, δ_c): 150.5 (C^{Ar}), 149.4 (C⁶), 139.4 (C⁴), 132.7 (C⁸), 130.7 (C⁹), 129.8 (C¹¹), 129.6 (C^{Ph}), 129.5 (C^{Ph}), 129.4 (C^{Ph}), 128.9 (C⁵), 128.4 (C^{Ph}), 127.6 (C³), 127.3 (C^{Ph}), 127.1 (C^{Ph}), 124.5 (C¹⁰), 109.4 (C^{Ar}) and 39.5 (Me).

[Pt(L)(PPh₃)]PF₆ (13)

[PtCl(L)] (**8**) (20 mg, 0.0289 mmol) and triphenylphosphine (12 mg, 0.045 mmol) were heated at 60 °C in chloroform (3 mL) to give a yellow solution. NH₄PF₆ (12 mg, 0.073 mmol) in methanol (1 mL) was then added and the solution was concentrated to give the required product as a yellow solid (29 mg, 94%). Found: C, 53.91; H, 3.34; N 2.13, calcd. (%) for C₅₂H₃₈N₂P₂F₆Pt: C, 53.88; H, 3.33; N 2.37. IR (neat, ν , cm⁻¹): 3006, 1577, 1548, 1472, 1437, 1277, 1261, 833 and 750. ESI-MS (acetone, m/z): found: 916.2413; calcd. 916.2420 for C₅₂H₃₈N₂PPt, [M-PF₆]⁺. ³¹P-NMR (161.9 MHz, CDCl₃, δ in ppm): 27.6 (s), ¹J(PtP) = 4144 Hz (PPh₃) and -143.2 (septet), ¹J(PF) = 720 Hz, (PF₆⁻). ¹H NMR (400 MHz, CDCl₃): δ 7.90-7.86 (m, 6H, H^{Ph}), 7.62-7.57 (m, 3H, H^{Ph}), 7.57-7.51 (m, 4H, H^{Ph} & H⁴), 7.31-7.27 (m, 6H, H^{Ph}), 7.21-7.13 (m, 4H, H^{Ph}), 7.01-6.94 (m, 4H, H^{Ph} & H⁵), 6.88 (br, d, 1H, ³J(HH) 5.6 Hz, H⁶), 6.82 (d, 1H, ³J(HH) 8.3 Hz, H³), 6.81-6.76 (m, 2H, H^{Ph}), 6.56-6.45 (m, 3H, H⁸, H⁹ & H¹⁰) and 6.28 (d,

^1H , $^3\text{J}(\text{HH})$ 7.9 Hz, H^{11}). ^{13}C NMR: δ 162.6, 161.0, 158.9, 157.4, 150.9 (C^6), 150.5, 148.8, 139.7 (C^4), 138.4 (C^8), 136.3, 135.8, 135.4, 135.2, 135.1, 134.8, 132.0, 129.8 (C^{11}), 129.7 (C^9), 129.6, 129.5, 129.3, 129.2, 129.1, 129.0, 128.8, 128.7, 128.3 (C^3), 128.2, 127.1 (C^5), 126.7 and 124.6 (C^{10}).

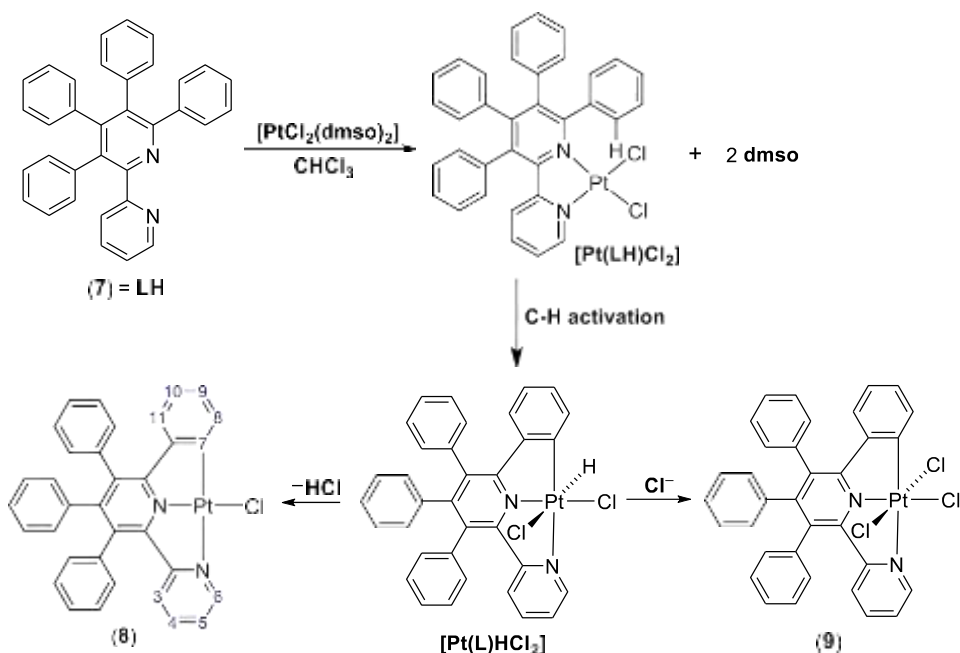
[(L)Pt(dppm)Pt(L)][PF₆]₂ (14)

A suspension containing [PtCl(L)] (**8**) (20 mg, 0.029 mmol), bis(diphenylphosphino) methane (dppm) (5.5 mg, 0.014 mmol) and NH_4PF_6 (10 mg, 0.061 mmol) in a mixture of degassed acetonitrile (4 mL) and chloroform (1 mL) was heated to 65 °C for 1 h. The resulting yellow solution was allowed to cool and was filtered. The filtrate was concentrated upon a low volume, and ethanol was added to give the required product as yellow needles, (24 mg, 85%). Found: C, 54.03; H, 3.35; N 2.62, calcd. (%) for $\text{C}_{93}\text{H}_{68}\text{F}_{12}\text{N}_4\text{P}_4\text{Pt}_2 \cdot 1.0\text{CHCl}_3$: C, 53.69; H, 3.31; N 2.66. IR (neat, cm^{-1}): 1474, 1438, 1405, 1166, 1098, 1015, 832, 770, 757, 734 and 693. MS (m/z -MALDI-TOF, CH_2Cl_2): found: 1837.3859; calcd. 1837.3856 for $\text{C}_{93}\text{H}_{68}\text{F}_6\text{N}_4\text{P}_3\text{Pt}_2$, $[\text{M-PF}_6]^+$. ^1H NMR (400 MHz, CD_3CN): δ 8.12-7.91 (m, 8H, H^{Ph}), 7.56 (t, 2H, $^3\text{J}(\text{HH}) = 8.0$ Hz, H^4), 7.52-7.46 (m, 4H, H^{Ph}), 7.46-7.28 (m, 22H, H^6 & H^{Ph}), 7.21 (m, 4H, H^{Ph}), 7.14 (m, 4H, H^{Ph}), 7.08-7.01 (m, 6H, H^{Ph}), 6.97 (d, 2H, $^3\text{J}(\text{HH}) = 7.5$ Hz, H^8), 6.78 (t, 2H, $^3\text{J}(\text{HH}) = 6.4$ Hz, H^5), 6.69 (d, 2H, $^3\text{J}(\text{HH}) = 8.3$ Hz, H^3), 6.65 (t, 2H, $^3\text{J}(\text{HH}) = 7.3$ Hz, H^9), 6.53 (t, 2H, $^3\text{J}(\text{HH}) = 7.5$ Hz, H^{10}), 6.01 (d, 2H, $^3\text{J}(\text{HH}) = 8.0$ Hz, H^{11}) and 4.93-4.67 (vt, 4H, $^2\text{J}(\text{PH}) = 12.7$ Hz, CH_2). ^{13}C NMR (100.6 MHz; CD_3CN , δ_{C}): 160.2, 158.5, 157.4, 152.8 (C^6), 150.9, 148.8, 139.5 (C^4), 138.6, 137.8 (C^8), 136.5, 136.0, 136.9, 135.4, 135.1, 133.76 (C^{Ph}), 133.7 (C^{Ph}), 133.6 (C^{Ph}), 132.1 (C^{Ph}), 130.3 (C^{11}), 129.8 (C^{Ph}), 129.5 (C^{Ph}), 129.4 (C^{Ph}), 129.1 (C^9), 129.0 (C^{Ph}), 129.0 (C^{Ph}), 128.9 (C^{Ph}), 128.5 (C^{Ph}), 127.9 (C^3), 127.2 (C^{Ph}), 126.8 (C^5) and 124.8 (C^{10}). ^{31}P NMR (161.9 MHz, CD_3CN , δ in ppm): 13.4, $^1\text{J}(\text{PtP}) = 4208$ Hz.

Results and Discussion

Treatment of (**7**) with $[\text{PtCl}_2(\text{dmso})_2]$ (dmso = dimethyl sulfoxide) in boiling chloroform resulted in the formation of a mixture of cyclometallated square-planar platinum(II) complex $[\text{PtCl}(\text{L})]$ (**8**) and

an octahedral platinum(IV) complex *mer*-[(L)PtCl₃] (**9**), both containing an anionic tridentate (C⁻N⁻N) ligand. The orange complex (**8**) was not very soluble in common deuterated solvents and in the proton NMR spectrum, the proton (H6) on the carbon adjacent to nitrogen was the most deshielded and the resonance appeared as a multiplet at 9.37 ppm. The complex (**9**) was characterised by X-ray crystallography and confirmed the presence of *mer*-geometry around the platinum centre (Figure 3). In the proton NMR spectrum, the H6 proton appeared as a multiplet at 9.51 ppm. One can argue that the complex (**5**) could have been formed by the replacement of the platinum hydride of the intermediate [Pt(L)HCl₂] which was due to the oxidative addition of phenyl C–H bond by a chloride ligand formed during the reaction (see Scheme 1). It is clear that the intermediate [(L)PtHCl₂] undergoes reductive elimination of HCl to produce the square-planar platinum(II) complex [PtCl(L)] (**8**). It is known, in the presence of a base, one could readily remove HCl from a platinum(IV) complex containing a PtHCl₂ moiety. As expected, addition of triethylamine to the above reaction mixture improved the yield of [PtCl(L)] (**8**).



Scheme 1. Possible mechanism for the formation of complexes **(8)**-**(9)**; and atom labelling used for the assignment of NMR data

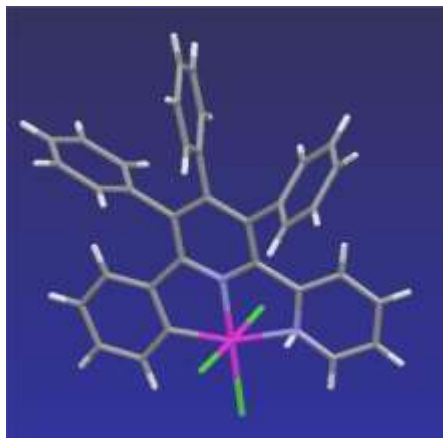
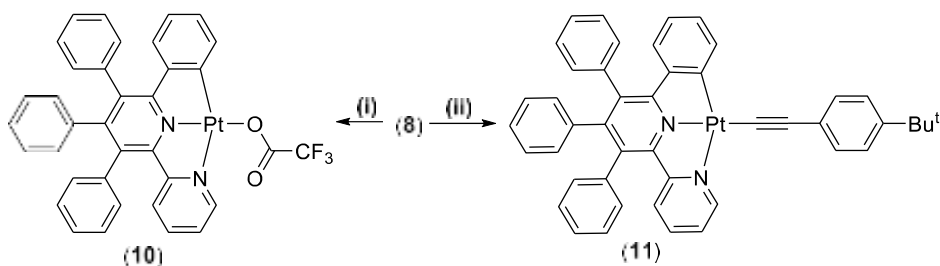


Figure 3. Molecular structure of *mer*-[(L)PtCl₃] (**9**)

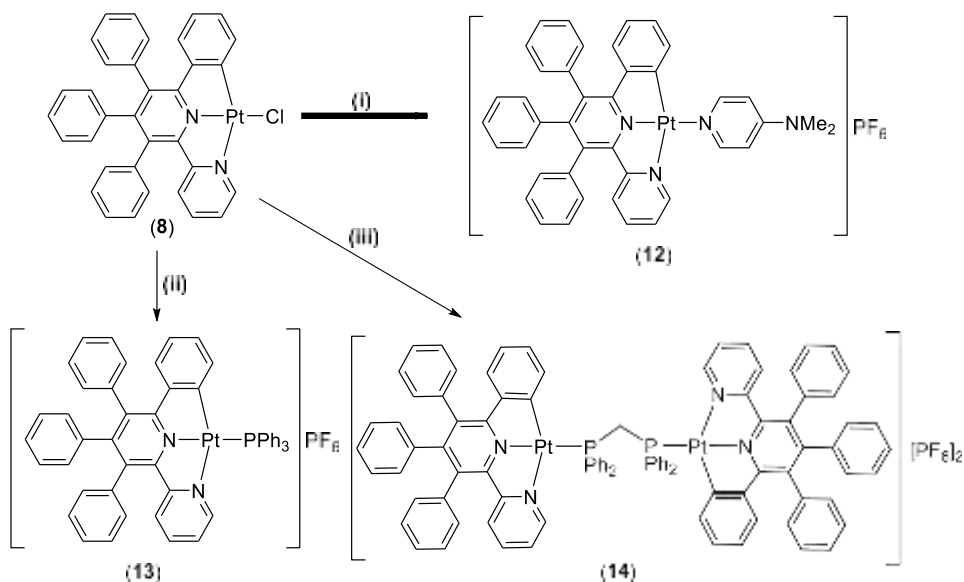
Square-planar platinum(II) complexes are being used to study substitution reactions with anionic ligands. The chloride of **(8)** can be easily replaced by trifluoroacetate ion to produce [(L)PtO₂CCF₃] (**10**) a red solid with 93% yield. The IR spectrum of **(10)** showed an IR band at 1659 cm⁻¹ for the C=O group. The complex is quite soluble in organic solvents and it was well characterized. The ¹⁹F NMR spectrum showed a singlet at -75.6 ppm for the fluorine nuclei in the CF₃ group.



Scheme 2. Synthetic routes to complexes **(10)**-**(11)**; (i) AgO₂CCF₃; (ii) HC≡CC₆H₄Bu^t-4

Cyclometallated Pt(II) acetylides have shown interesting photo-physical properties (Feng, *et al.*, 2006; Shao, *et al.*, 2008; Lu, *et al.*, 2004) and the complex **(8)** was converted into its acetylide [(L)PtC≡CC₆H₄Bu^t-4] (**(11)**) of 83% yield, by reacting it with 4-*tert*-butylphenyl acetylene in the presence of triethylamine and catalytic amount of CuI. In the ¹H NMR spectrum, the resonances of the aryl group (-C₆H₄Bu^t-4) appeared as an AB pattern at 7.60 (d) and 7.40 (d) ppm with ³J(HH) = 7.8 Hz for aryl protons and a singlet at 1.36 ppm for the nine *tert*-butyl protons. The IR spectrum of **(11)** showed an IR band at 2099 cm⁻¹ for the acetylideligand.

It is interesting to study the substitution of the chloride ion by neutral ligands such as pyridine and phosphine ligands to make the less soluble platinum(II) complex **(8)** more soluble in the form of a salt. Replacement of the labile chloride ligand with 4-dimethylaminopyridine (DMAP) in the presence of NH₄PF₆ resulted in the formation of the salt [Pt(L)(DMAP)]PF₆ (**(12)**). The complex **(12)** was characterised by X-ray crystallography (Figure 4). In its ¹H-NMR spectrum, the methyl proton resonance of NMe₂ group appeared as a singlet at 3.25 ppm.



Scheme 3. Synthetic routes to complexes **(12)**-(**14**); (i) DMAP/NH₄PF₆; (i) PPh₃/NH₄PF₆; (iii) 0.5 equiv. dppm/NH₄PF₆;

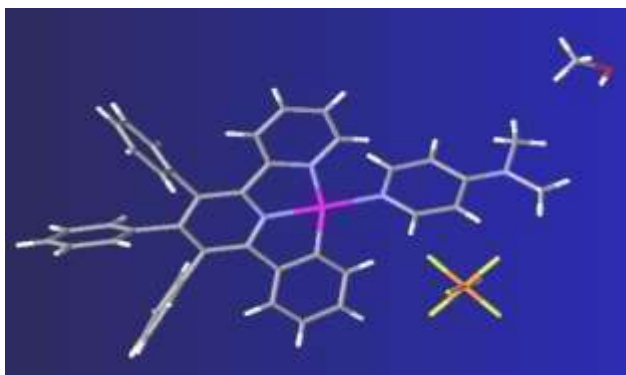


Figure 4. Molecular structure of [Pt(L)(DMAP)]PF₆ (**12**)

Replacement of the labile chloride ligand by triphenylphosphine formed the salt (**13**) as a yellow solid of 94% yield. ³¹P-{¹H} NMR spectrum of (**13**) showed a singlet at 27.6 ppm with platinum satellites, ¹J(PtP) = 4144 Hz, for PPh₃ and a septet at -143.2 ppm for the PF₆⁻ group. Replacement of two chloride groups from two complexes of (**8**) by one dppm ligand gave the dppm-bridged binuclear dicationic salt [(L)Pt(μ-dppm)Pt(L)](PF₆)₂ (**14**). The phosphorus resonance of (**14**) was 13.4 ppm with ¹J(PtP) = 4208 Hz.

Conclusions

The bulky ligand (**7**) containing four phenyl groups was converted into a quite insoluble cyclometallated terdentate complex [(C[^]N[^]N)PtCl]. However, it can be made more soluble by replacing the chloride ligand to produce the corresponding trifluoroacetate and acetylide. Introduction of a neutral ligand such as pyridine or phosphine generated more soluble salts of the type [(C[^]N[^]N)Pt(L')]PF₆ where L' = PPh₃, DMAP. A binuclear complex bridging two (C[^]N[^]N)Pt units with dppm was also prepared.

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Emotional Experiences and Expressions of Individuals in the Sri Lankan Context: The Roles of Gender, Culture and Religion

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Abstract

The present study focused on exploring the emotional experiences and expressions of individuals, the variation in emotional expressions in different social relationships, and their perceptions about the cultural and religious appropriateness of expressing certain emotions. The sample consisted of 54 Sri Lankans who were selected using convenience sampling and the participants were aged between 17 to 64 years. A questionnaire was used to examine how often individuals experience basic emotions and some secondary emotions, to what extent they think that they can express these emotions, the appropriateness of expressing basic emotions to individuals in various relationships, and the appropriateness of feeling and expressing basic emotions according

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to their cultural and religious backgrounds. Results suggested significant gender differences in experiencing and expressing emotions. There were significant relationships between feeling and expressing some emotions. There were variations in emotional expressions in different social relationships. Findings also suggested that individuals accepted the experience and expression of some emotions according to their cultural and religious backgrounds.

Keywords: emotional experience, emotional expression, gender, culture, religion

Introduction

Emotions serve important purposes in human life. Emotional experience can be described as a reaction of the whole organism to an internal or external event (Pettijohn, 1991). Emotions produce physiological, cognitive, and behavioral changes. Theories of emotion explain how individuals experience various emotions. Some theories have focused on somatic, neurobiological, and cognitive components of emotions whereas others have investigated the behavioral expressions of emotions. With respect to the expression of emotions, researchers have explored universal as well as culturally-specific patterns of emotional expression (e.g., Ekman et al., 1987, Kang, Shaver, Sue, Min, & Jing, 2003). Lately, the focus has shifted to the understanding of individuals' emotions and feelings in daily life (Kang & Shaver, 2004). Considering individuals' emotional experiences, it is important to state two main concerns raised by Frijda (1986). One was what differentiates an emotional experience from other experiences and what allows people to identify their experiences as emotional. The other was, what distinguishes one emotion from another and what allows people to recognize or classify their emotional experiences as happiness, sadness, anger etc. Research has been conducted on various aspects of emotions; however, there is a need for further investigation into emotional experiences and expressions of different groups, particularly those who live in different cultural milieus.

Review of Literature

Emotional Experiences and Gender

Generally, it is believed that females are more emotionally expressive than males. A considerable body of research has revealed emotional differences between males and females (Parkins, 2012). Particularly, researchers have found gender differences in recognizing and expressing emotions, and gender stereotypes of emotions (Durik, Hyde, Marks, Roy, Anaya, & Schultz, 2006; Simpson & Stroh, 2004; Tracy & Robins, 2008). Previous studies have found that females, compared to males, tend to have greater emotional expressiveness (Fabes & Martin, 1991; Kring & Gordon, 1998; Parkins, 2012; Smith, Brescoll, & Thomas, 2016). They intensely use every category of emotional expressions compared to males. Especially, they tend to use more emotional expression markers when they show their emotions online than males (Parkins, 2012). At all ages, girls and female adults recognize facial expressions of emotions more accurately than boys and male adults do (Olderbak, Wilhelm, Hildebrandt, & Quoidbach, 2019).

Previous research has shown that certain gender stereotypes are related to specific emotions (Kelley & Hutson-Comeaux, 2002; Parkins, 2012). Emotions such as happiness, sadness, and fear are generally related to females. In contrast, certain emotions (e.g., anger) are linked to males (Kelly & Hutson-Comeaux, 1999; Parkins, 2012). With respect to positive and negative emotions, females are supposed to exhibit more positive emotions than men, particularly in another-oriented context (Johnson & Shulmans, 1988). However, some studies have suggested little difference with respect to the expression of males and females' emotional experiences (Fabes & Martin, 1991).

It seems that most of the research on gender differences in the category of emotion stereotype was based on beliefs or perceptions about emotional expressions rather than beliefs about individuals' emotional experiences as a whole (Kelly & Huston-Comeaux, 2002).

Also, researchers have examined beliefs or perceptions of individuals' emotional experiences rather than their actual experiences of emotions. Therefore, this study aimed to examine how individuals, both males and females living in a more collectivist cultural setting, feel and express basic and some secondary emotions.

Emotional expressions in Social Relationships

Even though emotion is a biologically manifested component, emotional experiences and expressions can be socio-culturally determined (Mesquita & Walker, 2003; Panayiotou, 2004). Culture plays a significant role in shaping individuals' behavior and therefore, the core of emotions can also be influenced by the socio-cultural environment in which they live (Lutz, 1988; Turner, & Stets, 2005). In addition, culture may have an effect on the way in which individuals experience and express their emotions. As a result, emotional expressions of individuals may vary across cultures.

Because of certain cultural beliefs and perceptions related to emotions, emotional expressions of individuals may vary across social situations and social relationships. Emotions help individuals prepare themselves to adapt to various situations. They can signal persons to continue actions or conditions that enhance their well-being and to realize that the way they express or manage their emotions can considerably impact on initiating, facilitating and maintaining their relationships with others (Campos, Mumme, Kermoian, & Campos, 1994). Emotional expressions are used to convey individuals' needs and desires to other members in their social context. Researchers have also highlighted the importance of understanding emotional expression in the context of social relationships (e.g., Chaplin, 2015).

Culture, Religion and Emotional Experiences

Each culture has its own cultural values that guide individuals to form their perceptions, beliefs, and behavior patterns within their socio-cultural milieus (Matsumoto et al., 2008; Wong, Bond, & Mosquera, 2008) and these values describe what is good as well as

appropriate within their cultural contexts (Schwartz, 2004). The cultural values related to emotions present guidelines for individuals' emotion regulation and emotional expressions, especially in their social relationships (Matsumoto et al., 2008). Therefore, cultural beliefs, customs, and individuals' perceptions and expectations about their feelings and emotions may influence their emotional expressions (Wong et al., 2008).

Eastern culture has been described as collectivist because the individuals in this cultural setting are expected to adjust to their social group in order to maintain harmony in the society (Cross, Hardin, & Gercek-Swing, 2011; Oyserman & Lee, 2008). Collectivist cultures tend to value low arousal emotions more than high arousal emotions. Therefore, individuals in these cultures experience and would rather experience low arousal emotions over high arousal emotions (Lim, 2016). Researchers have stated that individuals in collectivist cultures believe that they express basic emotions less than people in individualistic cultures (Ekman, 1972; Matsumoto & Kupperbusch, 2001; Pittam, Gallois, Iwawaki, & Kroonenberg, 1995). They tend to rate expressing and experiencing basic emotions less intensely (Biehl et al., 1997; Matsumoto & Ekman, 1989; Matsumoto, Kudoh, Scherer, & Wallbott, 1988). Further, they experience emotions such as shame and guilt more strongly than people in individualistic cultures (Kitayama, Markus, & Matsumoto, 1995). Unlike individualistic cultures, collectivist cultures give more importance to the initiation and maintenance of interpersonal relationships and, as a result, people in these cultures tend to build up strong and secure relationships with their family members and friends (Matsumoto & Juang, 2004; Markus & Kitayama, 1991). This may cause them not to express certain emotions (e.g., negative emotions) towards other members in their social environment since they want to maintain group harmony (Franzoi, 2015). In addition, culturally specific patterns of behaviors and responses may influence individuals' emotional experiences (Kitayama, Markus, & Kurokawa, 2000).

Considering cultural differences in emotional experiences, it seems

that emotions are expected to reflect the self with respect to others in collectivist cultures (Mesquita, 2001). Therefore, emotions can be a sign of individuals' relations with others. People in these cultures may hinder certain emotional expressions as they want to maintain harmony within their social group (as cited in Kang et al., 2003). Particularly, people in some Asian cultures may inhibit certain emotions and emotional expressions when they realize that their emotional expressions may hurt others' feelings or damage their relationships with others (Wierzbicka, 1994).

While western culture emphasizes maximizing positive emotions and expressions, eastern cultures endorse emotional self-regulation and keeping a balance between all extreme emotions (Leu, 2005). This may be due to the impact of their cultural and religious backgrounds. Some religions (e.g., Buddhism) may emphasize the importance of maintaining emotional balance. Research has also found that religion is related to higher well-being (Koenig, 2012; Koenig et al. 2012). Religious involvement may positively influence individuals' well-being since it helps individuals gain emotional support, particularly in dealing with negative emotions (Bergin, 2000; Koenig, 1998) and negative life events (Pargament, 1990). Religious beliefs also have a positive effect on dealing with emotional pain (Santrock, 2004). Therefore, individuals' religious background may influence their emotional experiences and expressions.

In summary, the present research focused on understanding emotional experiences of individuals living in the Sri Lankan context. Also, it explored whether individuals' emotional expressions vary depending on their relationships with other members in the social context. Further, it investigated the impact of religious and cultural background on their emotional experiences.

Methodology

Participants and Procedure

A total of 54 adults (26 males and 28 females) who lived in the Western Province, Sri Lanka participated in this study. A

convenience sampling method was used for the data collection. Participants' ages ranged from 17 to 64 with a mean of 28 years. All participants were Sinhalese Buddhists and they participated in the study voluntarily. A questionnaire was developed to assess emotional experiences and expressions of individuals and then it was translated into Sinhala language and re-translated into English to check for any discrepancies. The researcher explained the purpose of this study to the participants briefly and they were given instructions before completing the questionnaire.

Materials

A questionnaire was developed to assess a) how often individuals feel/experience basic emotions: happiness, sadness, anger, fear, surprise, disgust, and some secondary emotions: pride, excitement, pleasure, shyness, contempt, pain, embarrassment, shame, frustration, boredom, skepticism, defense, contemplation, and exasperation, b) to what extent they think that they can express these basic emotions and secondary emotions, c) whether they think that it is appropriate to express basic emotions to individuals in various relationships such as one's parents, siblings, spouse, one's own children, friends, neighbors, and males and females in general, and d) the appropriateness of feeling and expressing basic emotions according to their religious and cultural backgrounds. The participants rated how often they experience basic and secondary emotions using a 5-point scale (1 = *never* and 5 = *always*). The other items of the questionnaire were rated on a 5-point scale (1 = *never* and 5 = *very much*). In addition, participants answered demographic questions including gender, age, marital status, religion, ethnicity, living area and education.

Findings

Experiencing Basic and Secondary Emotions

Multivariate Analysis of Variance (MANOVA) revealed a significant effect for gender. Given the significance of the effect for gender, the univariate main effects were examined. The results of a univariate

Analysis of Variance (ANOVA) revealed significant gender differences in experiencing both basic and secondary emotions. Accordingly, there were significant gender differences in feeling sadness, anger, pleasure, and shyness. With regard to sadness, results of Levene's test showed that it was not significant and therefore, the homogeneity of variance assumption was not violated. The main effect for gender was significant for sadness $F(1, 52) = 5.82, p < .05$. Females experienced sadness more often than males. With respect to anger, Levene's test showed that the homogeneity of variance assumption was met. The main effect of gender was significant for anger $F(1, 52) = 6.78, p < .05$, indicating that males feel anger more often than females. Further, a significant gender difference was found for shyness $F(1, 52) = 4.63, p < .05$ and pleasure $F(1, 52) = 5.94, p < .05$. Accordingly, females experienced pleasure and shyness more often than males.

Expressing Basic and Secondary Emotions

Results of MANOVA revealed significant multivariate main effects for gender. Therefore, the univariate main effects were examined. Results revealed significant gender differences in expressing three emotions: anger, shyness, and exasperation. A significant gender difference was found for expressing anger $F(1, 52) = 6.17, p < .05$, indicating that males express anger to a greater extent than females. The main effect of gender was significant for expressing shyness $F(1, 52) = 9.83, p < .05$. Accordingly, females express shyness to a greater extent than males. Also, the main effect of gender was significant for expressing exasperation $F(1, 52) = 5.14, p < .05$. It revealed that males express exasperation to a greater extent than females.

Relationships between Experiencing and Expressing Basic and Secondary Emotions

Correlational analyses were conducted to examine the relationships between feeling and expressing basic emotions. Findings revealed significant positive relationships between feeling and expressing happiness, anger, fear, disgust and contempt for the entire sample. There was a significant correlation between feeling and expressing happiness ($r(54) = .48, p < .01$). There was a positive relationship

between feeling and expressing anger ($r(54) = .35, p < .01$). The relationship between feeling and expressing fear was also significant ($r(54) = .51, p < .01$). In addition, there were significant associations between feeling and expressing contempt ($r(54) = .40, p < .01$) and disgust ($r(54) = .28, p < .05$).

Considering secondary emotions, there were significant correlations between feeling and expressing secondary emotions such as pride, excitement, shyness, shame, and exasperation for the entire sample. Among these emotions, the relationship between feeling and expressing emotions were stronger for shyness ($r(54) = .57, p < .01$), shame ($r(54) = .61, p < .01$), and exasperation ($r(54) = .46, p < .01$).

Emotional expressions in Social Relationships

This study also examined whether the appropriateness of emotional expressions varied across individuals' relationships: with one's parents, siblings, spouse, one's own children, friends, neighbors, and males and females in general. There were significant relationships differences with respect to the appropriateness of expressing emotions. Individuals reported that it was more appropriate to express sadness to their spouses ($M = 3.07, SD = 1.46$) compared to their children ($M = 2.37, SD = 1.38$). Furthermore, they stated that it was more appropriate to express anger to their spouses ($M = 2.20, SD = 1.27$) compared to their parents ($M = 1.73, SD = 1.11$) (see Table 1).

Table 1.

The Appropriateness of Emotional Expressions in Social Relationships

Emotions	Relationship	Relationship	Mean Difference
Sadness	Spouse	Children	0.70*
Anger	Spouse	Parents	0.47*

* $p < .05$

Culture, Religion and Emotional Experiences

Further, the present study investigated the appropriateness of feeling and expressing emotions according to their cultural and religious backgrounds. The participants were asked to report whether it was appropriate to feel and express basic emotions, happiness, sadness, anger, fear, surprise, disgust, and contempt according to their culture/s. Findings suggested that individuals tend to accept the experience of some positive emotions such as happiness within their cultural context. Also, they tend to believe that it is appropriate to feel some emotions such as sadness, surprise, but not anger or contempt according to their culture (see Figure 1).

Similar results can be observed in relation to the appropriateness of expressing emotions including happiness, sadness, anger, fear, surprise, disgust, and contempt. Individuals believe that it is appropriate to express happiness, sadness and surprise within their cultural setting. However, they do not think that it is appropriate to express, especially anger and contempt according to their culture (see Figure 2).

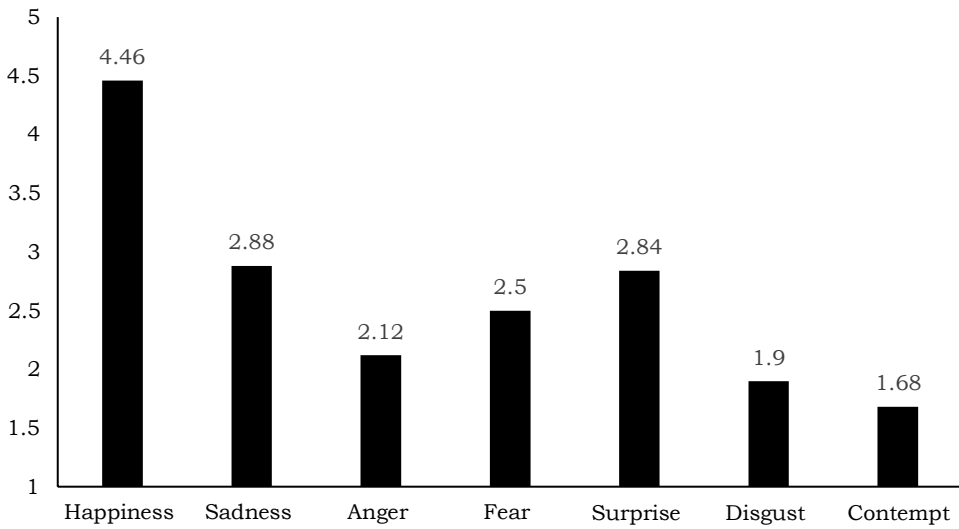


Figure 1. Appropriateness of Feeling Emotions according to Culture

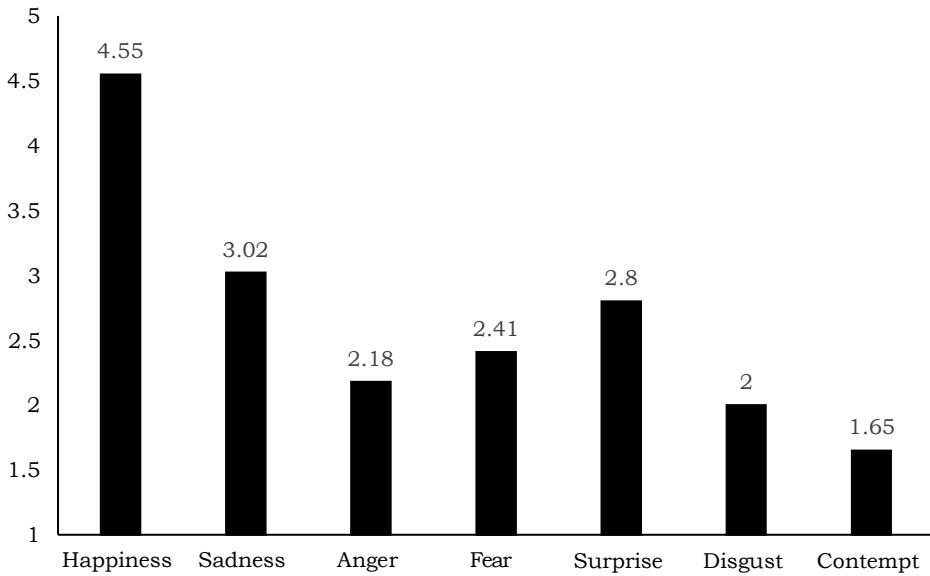


Figure 2. Appropriateness of Expressing Emotions according to Culture

In addition, participants reported that it was appropriate to feel emotions like happiness according to their religion; however, it was inappropriate to feel emotions such as anger, disgust, and contempt (see Figure 3). A similar trend was observed in relation to the expression of these emotions (see Figure 4). That was, individuals were less likely to express emotions such as anger, contempt, and disgust as they thought that it was inappropriate according to their religious beliefs and practices.

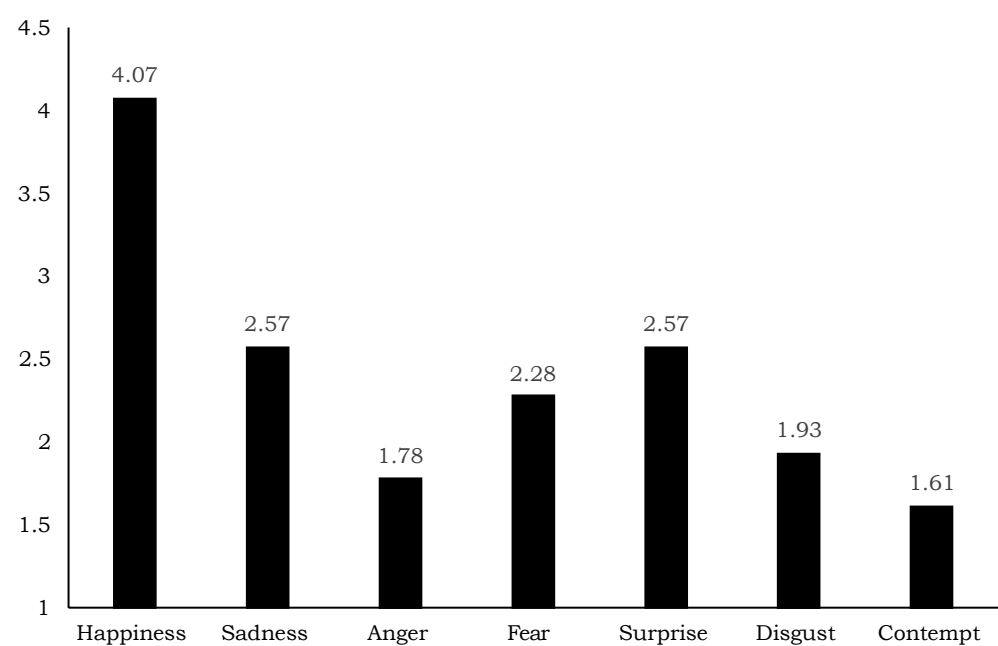


Figure 3. Appropriateness of Feeling Emotions according to Religion

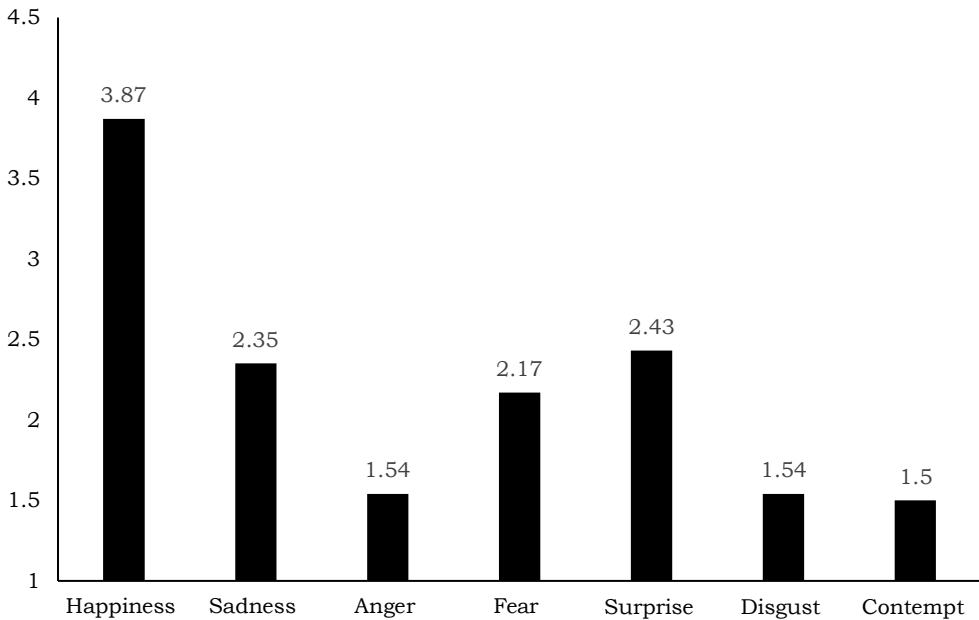


Figure 4. Appropriateness of Expressing Emotions according to Religion

Discussion and Conclusion

The current research focused on understanding the emotional experiences and expressions of individuals, the variation in emotional expressions in their social relationships, and their beliefs about the cultural and religious appropriateness of expressing certain emotions within their socio-cultural context. Considering the experience of basic and secondary emotions, findings suggested that females experienced sadness more often than males and males experienced anger more often than females. Previous research has revealed gender stereotypes in relation to some emotions (Kelley & Hutson-Comeaux, 2002; Parkins, 2012). Accordingly, sadness was generally associated with females and anger was related to males. Findings of the present study support the previous findings with respect to the gender difference in experiencing certain emotions. Considering the secondary emotions, females reported that they felt

shyness and pleasure more often than males. Prior research has also suggested that females experience emotions such as shyness, shame and embarrassment more strongly than males (Miller, 1999, as cited in Mandal, 2008).

Present findings indicate gender differences in expressing emotions; that is, males tend to express anger and exasperation to a greater extent than females. Prior research has found that some emotions like anger (e.g., anger) are related to males (Kelly & Hutson-Comeaux, 1999; Parkins, 2012). Also, the evidence suggests that expression of anger is desirable for males but not for females. Generally, it is believed that males and females have norms of appropriate emotional expression (Smith, Brescoll, & Thomas, 2016). Previous research has demonstrated significant gender differences in emotional expressions in adults. It was evident that females are more emotionally expressive (Brody & Hall, 1993; Kring & Gordon, 1998), particularly for positive emotions than males (LaFrance, Hecht, & Levy Paluck, 2003). Also, they tend to internalize negative emotions (e.g., sadness) compared to males. On the contrary, males exhibited greater emotional expression, particularly for anger than females (Archer, 2004). Results of this study support the previous findings in relation to the gender differences in expressing anger. Additionally, the present findings suggested that females tend to express shyness to a greater extent than males.

With respect to the relationship between experiencing and expressing basic emotions, correlational analyses revealed significant positive relationships between feeling and expressing some positive and negative emotions such as happiness, anger, fear, disgust and contempt for the entire sample. Accordingly, individuals who felt these emotions thought that they could express these emotions to a greater extent. In addition, present findings suggested that individuals who felt secondary emotions including pride, excitement, shyness, shame and exasperation also are more likely to express these emotions to a greater extent.

Regarding the appropriateness of emotional expression in social relationships, it seems that individuals tend to choose what is

appropriate and inappropriate in relation to their relationships with other members in the social environment. Individuals reported that it was appropriate to express their sadness to their spouses but not to their children. Previous research has revealed significant cultural differences in norms and beliefs related to the appropriateness of expressing emotions in social relationships (e.g., Aune & Aune, 1996; Matsumoto, 1990). Further, several studies have indicated that parents play a vital role in the development of children emotional self-regulation and expression (Frankel et al., 2012). Some parents may consider that negative emotions are not good and therefore, they may believe that these emotions need to be controlled and should not be expressed to others (Eisenberg, Cumberland, & Spinrad, 1998).

In addition, individuals believed that it was inappropriate to express anger to their parents compared to their spouses. In a South Asian cultural setting, respect for elders is thought to be an important social norm (Dissanayake, 2018). Also, within the family, children seek advice from their parents and elders, particularly in special occasions in their family settings (Siddhisena, 2005). These cultural values and norms may influence emotional expressions of individuals within their family settings. Also, collectivist cultures consider maintaining connectedness and harmony with family members and friends (Matsumoto & Juang, 2004; Markus & Kitayama, 1991) and therefore, they may not express certain negative emotions (Franzoi, 2015). Findings of this research suggest that the appropriateness of expressing certain emotions, especially negative emotions, may vary across social relationships.

The present study also examined whether cultural and religious backgrounds of individuals influenced their beliefs regarding feeling and expressing emotions. The participants were asked to report whether it was appropriate to feel and express emotions: happiness, sadness, anger, fear, surprise, disgust, and contempt according to their culture and religion. Findings suggest that individuals tend to accept the experience of some positive emotions such as happiness, sadness, surprise, but not anger or contempt according to their

culture and religion. Individuals in collectivist cultures tend to value low arousal emotions. As a consequence of these cultural influences, there is a difference in actual arousal levels of emotional experience (Lim, 2016). For example, previous research has found that Asians exhibit low arousal emotions compared to Caucasians (Kacen & Lee, 2000). According to Silberman (2003), religion helps individuals decide what is appropriate and inappropriate in relation to emotional expressions and also the appropriate intensity of these expressions. This suggests that both cultural and religious background have an impact on individuals' emotional experiences and expressions.

To conclude, although emotion has a biological base, individuals' emotional experience is also influenced by the socio-cultural environment. Culture shapes the way individuals experience and express emotions in different social situations. Current findings strengthen the evidence of the influence of different socio-cultural factors on emotional experience and expressions. Thus, a cultural approach would be helpful in understanding emotional experience and expressions of individuals in a given culture.

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The Need for Reforming the Sale of Goods Ordinance of Sri Lanka: A Comparative Analysis

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Abstract

This research is based on the Sale of Goods Ordinance, No. 11 of 1896 which governs the sale of goods in Sri Lanka. The Ordinance is modelled on the English Sale of Goods Ordinance of 1893. Although the English law pertaining to sale of goods has been amended to cater to the modern-day developments, the Sri Lankan Ordinance has remained the same even after a century and more. This research is carried out following the traditional black letter approach of socio-legal research. Relevant reforms to the Sri Lankan Ordinance have been identified considering the relevant case laws and current developments in the sale of goods in Sri Lanka and globally. The analysis proves that there are many deficiencies in the Sri Lankan Ordinance when compared with the law in the United Kingdom and highlights the necessity for

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amendments in accordance with the latest technological developments and on the requisites of the parties engaged in the sale of goods. This research proposes new reforms and illustrates how the proposed reforms will provide solutions for the perceived deficiencies. This study mainly focuses on the nature of the selling goods, geographical limits related to sale of goods and the methods that the parties use to sell the goods. Furthermore, the study focuses on the remedies introduced to the parties involved in the sale of goods.

Keywords: Sale of Goods Ordinance, Sri Lanka, UK

Introduction

The sale of goods in Sri Lanka is governed by the Sale of Goods Ordinance, No.11 of 1896 (Hereinafter referred to as SGO) and the law is based on the United Kingdom's Sale of Goods Act of 1893 drafted by Sir Mackenzie Chalmers (*A.G v Abram Saibo*, 1915). United Kingdom (Herein after referred to as UK) has done several amendments to their law by the Sale of Goods Act of 1979 (SGA) which consolidated the Act of 1893 and further, by subsequent legislation with time. Over the last centuries, there has been a vast growth and a development in the technology as well as in the field of commerce. However, Sri Lanka for the past 120 years Sri Lanka has been using the same SGO and the static nature of the Sri Lankan SGO has led to a number of crucial problems. As Roscoe Pound stated, a law is not static and must adapt to the needs of a society (*Roscoe Pound - Further Readings*, 2020).

The Sri Lankan SGO consists of 59 sections and section 2(1) defines a sale and agreement to sell. From section 2(1) to 59 it discusses the multiple areas. However, with the development of the modern world there are some instances where the sale of goods does not fall under the purview of SGO. Since Sri Lanka is a developing country, economic development should be at the level of highest concern. The development of laws to suit the situations and to ease the process is very important. This research suggests potential amendments in a descriptive manner comparing the Sri Lankan law with that of England.

The research discusses the nature of selling goods, where the definition of “goods” is a major concern (section 59), geographical limits related to sale of goods and finally the methods by which sales are concluded. Even though the remedies are there to protect the parties under the SGO, there are loopholes which need to be addressed by amendments to the SGO. Therefore, the research discusses the remedies (sections 13, 14, 15 and 16) introduced to the parties by addressing the identified loopholes. In all the above situations, this research offers many statutes currently used in Sri Lanka such as Electronic Transactions Act, No. 19 of 2006, Consumer Affairs Authority Act, No. 9 of 2003 etc. for comparative purposes and at the same time, discusses and compares the laws related to sales of goods in the UK with those of Sri Lanka. Finally, the research in its conclusion offers suitable recommendations to the laws related to sales of goods in Sri Lanka and emphasizes that the Sri Lankan law related to sale of goods should be amended to reflect the latest needs in the commercial world.

The main research objective of this research is to assess whether Sri Lanka should also amend the laws related to sale of goods as in English legislatures based on the changing nature of commercial transactions.

Methodology

The overall approach to this research is based on the traditional black letter approach of the socio-legal research. The relevant statutory provisions and case laws are critically analyzed through a comparative analysis. Qualitative data were collected through a review of primary and secondary data sources. Primary data sources included national and foreign statutes, case law and secondary sources included books with critical analysis, law journals and conference papers etc. The scope of this research is limited to the nature of goods, the geographical limits, methods by which sales are concluded and remedies introduced to the parties.

Findings and Discussion

In this study, the writer has identified the problematic areas under the SGO and they are as follows:

1. The nature of the selling goods
2. Geographical limits related to the sale of goods
3. The methods that the parties use to sell goods

The SGO is limited to traditional types of goods and does not cater to novel goods such as software, mobile applications etc. The purview of the SGO is limited to transactions within one country and international trade is not addressed. Modern day transactions for sale of goods are revolutionary with the invent of e-commerce and such novel methods are not addressed. Due to these issues, the SGO should be amended, or a new Act should be introduced. Since there is a wide area to be discussed under the SGO, this research focuses only on the relevant sections.

Nature of Goods

This is an important area to be discussed and analysed because before the sale, the goods should be identified properly. That means the goods should be under the definition of the SGO for the concerned parties to apply the provisions. Section 59(1) of SGO states as follows:

“goods include all movables except money. The term includes growing crops and things attached to or forming part of the land which are agreed to be severed before sale or under the contract of sale.”

In the modern world, the goods which are involved in transactions are different. Novel goods are available to be purchased using online platforms such as music videos, software, computer games etc. The problem is that these products do not fall under the definition of SGO. The Intellectual Property Act, No. 36 of 2003 offers an option to solve several problems related to those types of product. Section 5 of this Act mainly focuses on computer software, broadcasting, music videos and many other digital purchases. If an Intellectual property right is violated, the parties

cannot take the remedies under SGO. However, using the Intellectual Property Act, No. 36 of 2003, the infringer can be sued easily for breaching the Intellectual property rights of parties.

St Albans City and District Council v International computers case (*St Albans City and District Council v International computers*, 1996) discussed the issue with regard to software. St. Albans City and District Council has bought a software to calculate tax money. The calculations made by the software were wrong and the issue at hand was whether the software falls under the category of goods or not. The court stated that if the software was connected with a hardware that could be considered as goods and just software could be considered as a service and further stated that it could be included in the Intellectual property category. In the above-mentioned case, the court opined that the quality and the fitness implied by section 14 of the Sales of Goods Act in England or the section 9 of the Supply of Goods and Services Act of England.

In the case *Robinson v Graves* (*Robinson v Graves*, 1935) dispute arose over an agreement. An artist had promised to make a portrait. The question arose on the definition of goods. English Court of Appeal held that it was a contract for "work and materials" and could not be considered as a good but could be considered as a service.

There are some instances where the customers buy software for a limited period of time such as virus guards. In the case *Watford Electronics Ltd v Sunderson* (*Watford Electronics Ltd v Sunderson*, 2001) it was decided that such a situation was covered under 1982 Supply of Goods and Service Act section 6(1) and not under 1979 SOG Act. Thus, the English court declared that in such an instance the software was a service. Sri Lanka does not have a Supply of Goods and Service Act. Furthermore, the SGO in Sri Lanka does not give a proper categorization to goods and services.

There were many serious issues that arose in deciding whether body organs should be considered as goods or not. That is again an unclear and complicated area that has to be analysed from an ethical point of view. Sri Lanka has special Acts which prohibit and

control selling of body organs and parts such as blood. In the *R v Australian Red Cross* (*R v Australian Red Cross*, 1991) the court held that blood could not be considered as goods and if it was considered as goods, there might be many moral and social issues. According to the section 59(1) of the SGO definition of goods, the “goods” include all movables except money. Based on that definition, body organs and parts when separated from body can be considered as “goods”. However, some goods including body organs are excluded by case law.

There are non-regenerative items that can be bought for money which get wasted after usage. Electricity is one such example. *Singer v Baltimore gas and Electricity* case (*Singer v Baltimore gas and Electricity*, 1989) stated that electricity does not fall under the interpretation of goods and Sri Lanka too follows the same law. In Sri Lanka, Electricity Act, No. 20 of 2009 is applied to situations where electricity is concerned.

Immovable things such as land, crops before they get separated from the land are not considered as goods according to the interpretation given under the SGO. For an example, in the case *Morgan v Russell* (*Morgan v Russell*, 1909) heap of slag and cinders were attached to land and due to the attachment, they were immovable and they were not considered as goods.

This creates problems, because for different products different statutes should be used. Due to this, the courts have to refer many statutes for the same type of cases where only the type of the product is different. In the SOG Act 1979 of England section 14(2) discusses the issue of quality of goods instead of merchantable quality. England has introduced that because the “quality of the goods” covers a broad area than the term “merchantable quality”, but this aspect is not present in the section 14 of the Sri Lankan SGO (Wijerathna, 2016).

Geographical limits

Nowadays, the buyers and sellers choose the internet to conduct their transactions because that makes the business fast and easy. Usage of emails, websites, such as e -bay for transactions, has

become a common practice. Credit cards and debit cards are commonly used in sale of goods, which is one of the latest trends in e-commerce. The Electronic Transactions Act, No. 19 of 2006 (based on the standards established by United Nations Commission on International Trade Law (UNCITRAL) Model Law on Electronic Commerce (1996) and Model Law on Electronic Signatures (2001)), Payment and settlement systems Act, No. 28 of 2005 and Payment Devices Frauds Act, No. 30 of 2006 are the new laws which have been introduced to this area. Section 5 of the SGO states that, *“the sale can be enforceable if the buyer has accepted the goods or part of it, paid the price or part of it or unless some note or memorandum in writing signed”* This section does not cover internet transactions. Atiyah states that, *“policy makers must be careful not to be carried away by the hyperbole and exaggeration which has, at times come to characterize the debate on the future development of electronic commerce”*(Atiyah et al., 2010).

When the buyer and the seller are from two different jurisdictions, problems arise due to non-compatibility of the laws with the main issue being the specific law which should be applied. The SGO is silent in such situations and due to that the parties face problems in solving their issues arising from sale of goods. In *Marchant Heyworth v Usoof* case (*Marchant Heyworth v Usoof*, 1955), the parties entered into a contract to sell 50 tons of rubber. The seller was in Sri Lanka and the buyer was in England. Seller could not send half of the stock. The buyer has taken compensation for that according to an arbitration order given by the English High Courts. However, the Sri Lankan Colombo District Court stated that the arbitration order could not be applied in Sri Lanka. Afterwards the Supreme Court has decided that arbitration could be impliedly applied in here and that there was no need of a written agreements for that purpose.

Especially, when there are two jurisdictions, where parties tend to engage in e-commerce such as electronic transactions using credit cards, the SGO does not govern such transactions. The Electronic Transaction Act, No. 19 of 2006 has been introduced to facilitate electronic transactions. The following areas covered under the Act:

1. Electronic records (Section 3)

2. Electronic signatures (Section 7)
3. Contracts (Section 11)
4. Liabilities of certification service providers (Section 16)

The SGO does not cover the frauds and errors attributed to credit card transactions. Section 9 of the SGO does not cover such issues. Payment and Settlement Systems Act, No. 28 of 2005 is there to solve the problems regarding credit card payments, electronic cheques and most of the other e-commerce transactions. The Payment Devices Frauds Act, No. 30 of 2006 deals with the frauds related to electronic transactions. The 1974 Consumer Credit Act of Britain controls the credit card transactions and, at the same time, it is connected to 1979 SOG Act (*Jarrett v Barclays Bank*, 1997). Therefore, it is clear that Sri Lanka maintains a blend of different statutes. That practice causes problems with the parties who are engaged in selling goods, since there are many statutes related to the same transaction itself.

The Part 5 of the English Act states that if the buyer is not happy with the stock of goods, the buyer can return the goods within 6 months of the delivery and can claim the amount paid or can claim to repair the goods when there are any defects. If the seller does not act accordingly, the buyer has the right to conclude the contract. In the English law a “Cooling- off period” is accepted. However, this cooling off period is not addressed in the SGO or any other law related to that in Sri Lanka.

Methods by which sales are concluded

There are enough ways to do transactions such as leasing, brokers, barter, hire purchase etc. (*Aldridge v Johnson*, 1857). New trends have been introduced to the commercial world to proceed with transactions. At certain instances, the seller has the full authority to keep the goods with him until he gets the full payment. Lien has been introduced by the *Aluminium Industries Vasen v Romalpa Aluminium Ltd* case (*Vasen v Romalpa Aluminium Ltd*, 1976) with the help of “Romalpa clause”. However, this was not accepted by *Borden (UK) Ltd v Scottish Timber Products Ltd* case (*Borden (UK) Ltd v Scottish Timber Products Ltd*, 1981). The new concept has been followed in *Clough Mill Ltd v Geoffrey Martin* (*Clough Mill Ltd v Geoffrey Martin*, 1984) and in *Henry Lennox (Industrial Engines)*

Ltd v Graham Puttick Ltd (Henry Lennox (Industrial Engines) Ltd v Graham Puttick Ltd, 1984) case. In the Sri Lankan context, no amendments have been introduced to this area, but England has introduced amendments which also addresses this new concept. Moreover, sales by the use of cheques, credit cards, promissory notes do not lie with the section 2(1) of the SGO, but still the main process is the sale of goods. Most of the parties use these new trends to complete their transactions and at the same time question arises because that does not lie under the SGO itself. The Bills of Exchange Act, No. 25 of 1927, the Payment and Settlement System Act, No. 28 of 2005, the Payment Devices Frauds Act, No. 30 of 2006 apply here.

The courts in *Helby v Mathews (Helby v Mathews, 1895)* held that lease does not lie under the SOG Act. Similarly, in *Belsize Motor Supply Company v Cox (Belsize Motor Supply Company v Cox, 1914)*, *De Silva v Kuruppu (De Silva v Kuruppu, 1941)* and *Karunapala v State (Karunapala v State, 1974)*, the court held that, hire purchase was not included in the sales of goods. Therefore, these cases have followed Consumer Credit Act, No. 29 of 1982 (Hereinafter referred to as CCA). In normal sales, the SGO sections 13 to 16 are applied for implied warranties and conditions, but for hired goods those sections cannot be applied. Section 3 of the CCA clearly provides the requirements relating to hire-purchase agreements. That clearly states about implied conditions and warranties under section 4, especially for hired goods. Section 6 provides for the passing of property in hire purchase etc. and all these are not covered under the SGO. The UK Consumer Credit Act of 1974, by virtue of section 8 gives the limit of credit as £ 25,000 and later amendments were made. The Sri Lankan CCA does not provide a credit limit which may be considered as an advantage.

The SGO of 1893, the Hire Purchase Act and Credit Sale Act, No. 06 of 1964 and the Consumer Credit Act of 1974 were combined to make the SOG Act of 1979 in England. In Sri Lanka, the laws related to sale of goods are dispersed among several statutes. Therefore, it is recommended that all related laws should be combined to form a single Act similar to England.

Section 14(3) of the English SOG Act of 1979 states that,

“where the purchase price or part of it is payable by instalments and the goods were previously sold by a credit-broker to the seller, to that credit-broker.”

This clearly depicts that the Acts have to be read with the SOG Act of England.

Sri Lankan SGO has no such advanced amendments and such transactions are covered by CCA of 1982. When it comes to hire purchase, if all the premiums have been paid, the transaction automatically turns to a normal sale under the SGO, which is not mentioned in the statute.

Remedies introduced to the parties

Remedies are to protect the parties under the SGO. However, the parties who are engaged in the process of sale of goods have a very limited knowledge about this area. The sections 13, 14, 15 and 16 come up with conditions and warranties which provide protection to buyers. The sections address implied undertaking as to title, sale by description, implied conditions as to quality or fitness and sale by sample. When the conditions and warranties are being breached, they can be enforced through the courts, but it is an arduous process. Therefore, the buyers do not tend to get that protection through court proceedings which lead to sellers enjoying undue advantages. Consumer Affairs Authority Act, No. 9 of 2003 (hereinafter referred to as CAAA) has been introduced to solve this issue and it covers the loopholes of the SGO. The CAAA can be applied to protect the consumers by the goods which are hazardous to life, to overcome unfair trade practices, for the consumers to have adequate access to goods and services at competitive prices, to seek redress against unfair trade practices and restrictive trade practices or from any other form of exploitation of consumers by trade (Section 7). Further, CAAA can be applied for false representations (Section 31) and when there is no due care and skill in sale of goods or services. (Section 32). Furthermore, it states that goods should be reasonably fit for the purpose as an implied warranty which is given under the sections

13, 14, 15 and 16 of the SGO. However, the SGO does not mention the provision of services. This can be considered as a weakness in the SGO.

In *shell gas v Consumers affairs authority* case (*Shell gas v Consumers affairs authority*, 2007) gas leaked from a gas cylinders which meant that the buyer could not use it. Even though the buyer could use the SGO to get the remedies, actions were taken under the section 13 of the CAAA.

The Food Act, No. 26 of 1980 and the Food Amendment Act, No. 20 of 1991 along with the other amendments, deal with issues related to food. Under the Food Act, selling and display of food, their quality and sanitation are addressed. The SGO does not address the above-mentioned issues related to food. It creates a problem on the SGO itself because food also can be considered as goods.

The protection given to the buyer under sections 13, 14, 15 and 16 is not clear because SGO itself states that these protections can be excluded. To overcome the difficulties faced by the buyer and to stop the seller from having undue advantages, solutions have been introduced by the section 7(1), 7(2) and 7(3) of the Unfair Contract Terms Act, No. 26 of 1997. The section 7(1) states that, a contract term which exclude or restrict the section 13 of SGO shall be of no effect. The section 7(2) of the Act states that a contract term which exclude or restrict section 14, 15 and 16 of the SGO as against a person dealing as consumer shall be of no effect. Moreover, the section 7(3) of the Unfair Contract Terms Act, No. 26 of 1997 says that the restrictions allowed under section 7(2) for non-consumers should be reasonable. These are examples of the usage of other Acts to fill the gaps of the SGO. England is more advanced on this because they have introduced SOG Act of 1979 combining Unfair Contract Terms Act of 1977 and sections 12, 13, 14 and 15 of the SGO of 1893.

Section 75 of the CAAA of Sri Lanka states that, consumer means any actual or potential user of any goods or services made available for a consideration by any trader or manufacturer. Therefore, it is

evident that the services are also covered by this Act. In the Act, goods mean any food, drink, pharmaceutical, fuel and all other merchandise and there the service means service of any description which is made available to actual or potential users. The area covered by this Act is broader than the area which is covered by the SGO. Therefore, many gaps in the SGO is filled by the CAAA in Sri Lanka. In England, the amendments have been carried out to the Sale of Goods Act to cover the services. English Sales and Supply of Goods to Consumer Regulations 2002 have also introduced certain remedies for these areas.

In *Jayasena Perera v Ratnadasa* (*Jayasena Perera v Ratnadasa*, 1981) Sharvananda J has applied the sections 18, 19, 20, 50 and 57 with the sections 12, 13 and 14 of the Motor Traffic Act. This shows that the SOG is applied with other Acts in the Sri Lankan courts.

Atiyah states that,

“Present law of Sale of Goods is somewhat patch work” (Atiyah et al., 2010).

In *Mercantile credit Ltd v Sirimawathie* (*Mercantile credit Ltd v Sirimawathie*, 1996) case the section 22 (d) of the SGO has been applied. It is clear that SGO is still in use despite the defects alluded to.

In view of minimizing the aforementioned issues, the new Act in England has taken into consideration the newer types of goods, geographical issues and novel modalities of selling goods, up to a certain extent. Furthermore, English courts have made clear connections with the other new Acts. Therefore, there is no necessity for the lawyers and judges to search for laws as in Sri Lanka.

There are some areas that have still not been covered by other Acts which creates further problems. Further, in some instances there are conflicts in the SGO itself. There is a conflict between the Section 34(1) and Section 35 in the Sri Lankan SGO. England has

introduced solutions through 1967 Misrepresentation Act section 4(2) for such conflicts.

If Sri Lanka introduce changes to the definition of goods to cover a vast area, if the geographical limits are considered in the SGO and further new methods of selling goods are being introduced, Sri Lanka will be able to minimize many problems related to sale of goods. A person can argue that there is no need for amendments because there are enough new Acts that have come up and without any issues people can use them. However, taking into consideration the complicated issues that arise in the modern business world, it is always easy and straightforward to use one Act which covers almost all these areas. Then these conflicts will not arise.

As Atiyah states, internationally people tend to minimize these problems by having special Conventions etc. International Convention on Sales of Goods (CISG) has been introduced, and as of 27 September 2019, 92 states have ratified, acceded to, approved, accepted, or succeeded to the Convention (*United Nations Treaty Collection*, 2020). Sri Lanka is not yet a signatory. However, if Sri Lanka follows CISG provisions, many problems would be solved.

Conclusions

In the modern era, with the technological advancement, the requirements pertaining to the sale of goods have evolved considerably. New trends such as digital techniques are at the forefront of transactions. Both buyer and seller have to adapt and deal with such changes. The laws pertaining to sale of goods should also evolve in tandem with the changing face of sales. However, the Sri Lankan laws have not experienced such drastic changes in comparison to other developed countries such as the UK. This stagnation has given rise to several issues for parties engaging in sales.

The future trends cannot be predicted and therefore reforms cannot be introduced to cater to potential new developments of the

future. However, reforms should take place to adapt to the current advancements. This is applicable to all areas of law. It is always true that no one can make complete laws to fulfil the needs of all the parties. However, to fulfil justice, better reforms should be introduced with a clear vision. Then only the sale of goods transactions will be done without any complexities leading to economic development.

The existing law regarding sale of goods is more than 120 years old, and amendments incorporating the latest developments is an urgent and an essential requirement. These new developments include e-commerce etc. Moreover, the reforms should protect the rights of the sellers and buyers who are engaged in sale of goods. Most areas of the SGO, including Section 17, need amendments, with due consideration given to current needs and complexities, to mitigate the predicaments. This has clearly shown results in countries such as the UK where they have introduced timely reforms. However, they too continually experience issues, due to the ever-changing trends in technology which are introduced to business transactions.

In consideration of the Sri Lankan SGO, there are many issues with the application of laws ranging from simple issues such as the definition of “goods” to complex issues such as contradictions within the same section. Following are the recommendations of this study to implement the related laws.

E-commerce should be added to the sections of the SGO. With the new amendments, offer and acceptance in sale of good transactions can be carried out with emails and other modalities of digital communications. This will expedite the transaction process and at the same time ease the process. The expected result of such reforms is the development of the commercial world.

Two countries may be involved in one particular transaction, and there may be contradictions of the applied laws. However, if the laws are similar and developed enough to meet the requirements of the day-to-day world, there will not be problems as transactions will go smoothly with the new developments. As previously explained, *Merchant Heyworth v Usoof* case (*Merchant Heyworth v*

Usoof, 1955) is an example for such situations. There are instances where the Sri Lankan courts have applied laws of other countries on similar matters. This clearly shows that Sri Lanka accepts the amendments and developments of the other countries to settle their matters related to sales of goods.

Even though there is an Electronic Transactions Act, No. 19 of 2006, e-commerce should be added to the sections of the SGO. Therefore, it will be easy for the lawyers and judges to handle the matters related e-commerce.

Credit card payment methods should be included in the SGO because in the modern world that is one of the mostly used methods to make payments. In the UK, Consumer Credit Act of 1974 is used as a solution to this problem. On the other hand, software programs and music videos also should be included in the category of goods to minimize the issues that arise due to defining “goods” under the SGO. Sections 13,14,15 and 16 cannot be applied to software as the SGO has not been amended to include such products. Therefore, to apply those sections, software should be included into the category of goods. There are other complicated situations such as blood and other body organs which are connected with ethical issues, which require careful consideration under the SGO.

In Sri Lanka it is evident that when there are issues with the sale of goods the Sri Lankan courts always tend to use other Acts than looking for a solution through the SGO itself. Therefore, the SGO should be amended properly in order to provide solutions to the current problems related to sale of goods.

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The Role of Bacterial Biofilms in Infections and Effective Prevention Strategies for Biofilm Formation in Urinary Catheters

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Abstract

Biofilm formation is a complicated microbiological process and one of the distinctive features of pathogenic bacteria. Biofilms are a cluster of bacterial cells enclosed in extra polymeric substances and irreversibly attached onto a surface. Biofilms have a major impact on public health as biofilm associated bacteria are able to survive and populate in indwelling medical devices, causing

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severe nosocomial and recurrent infections. Biofilm-embedded bacteria have unique characteristics which are harder to destroy than the planktonic forms. Especially biofilm bacteria are highly resistant to antimicrobial agents. Treating patients undergoing long term urinary catheterization is becoming complicated by encrustation and blockage due to crystalline biofilm formation inside the lumen of catheters. Further, all types of indwelling catheters including silver or nitrofurazone-coated devices are vulnerable to biofilm formation.

Therefore, there is an urgent requirement to develop either urinary catheters with other alternative coatings or new urinary drainage systems which may lead to reduction of infections and morbidity. Other than that, controlling biofilm formation is a necessary requirement during both manufacturing and usage of catheters. Antifouling and biocidal coatings on the catheters are currently being investigated and it is proved that herbal products also express anti-biofilm activity.

This review is largely based on previous literature describing biofilm formation and their role in catheter associated urinary tract infection. Further, mechanism of biofilm formation in indwelling urinary catheters, antibiotic resistance patterns, and the detection methods of biofilm are briefly described. Understanding the mechanisms of biofilm formation and the antibiotic resistance patterns is of utmost importance which will result in the development of new remedies for biofilm infection.

Keywords: Antibiotic Resistance, Biofilm Formation, Urinary Catheters

Introduction

The Structure and Formation of Microbial Biofilms

Biofilm is defined as accumulation of the microbial organisms that is permanently attached to biotic and abiotic surface and generally enclosed in self-produced extracellular polysaccharide substances (EPS) (Sayal *et al.*, 2014; Wijesinghe *et al.*, 2019).

Biofilm production is a complicated microbiological process which is a major pathogenic event in the infection. It involves a sequence of steps, including irreversible attachment, accumulation, and maturation (Alves *et al.*, 2014; Tiwari & Ghnawate, 2017). When the bacterial colonies attach to surfaces, the bacterial cells upregulate genes which are specific for adhesion. Further, bacteria itself secrete a sticky gum like material for anchorage called as extracellular substances (Sayal *et al.*, 2014; Tiwari & Ghnawate, 2017; Wijesinghe *et al.*, 2019). Also, the bacteria populate by multiplying rapidly and spreading along the surface within the EPS of the biofilm. Some of the bacteria detach from the surface and again become into planktonic form and then attach to a new colonised surface (Tiwari & Ghnawate, 2017). This phenomenon helps the metastasis process of biofilm.

Initially the thickness of biofilm is approximately 200 μm and over time it reaches a thickness of $\sim 500 \mu\text{m}$ (Singha *et al.*, 2017). Types of EPS and the diversity of biofilm vary according to the bacterial species and strain (Osungunna & Onawunmi, 2018). Staphylococcal polysaccharide, *Pseudomonas aeruginosa* alginate, streptococcal and lactobacilli glucans and fructans are well known examples for biofilm-associated EPS. Biofilm is composed of small percentage of bacteria compare to EPS which occupies a large portion of biofilm (Tiwari & Ghnawate, 2017). EPS binds the bacteria together in a sticky web of twisted EPS fibers. The fibers interconnect the cells and anchor them to a surface, therefore EPS is considered as the backbone of biofilm (Murugan *et al.*, 2016). The formation of EPS permits the emerging biofilm community to develop a three-dimensional structure (Murugan *et al.*, 2016; Singha *et al.*, 2017). EPS and the accompanying web-like structure are known as extra cellular matrix or biofilm matrix. Bacterial colonies are found within the biofilm matrix (Tiwari & Ghnawate, 2017). Physical and the physiological properties of biofilm are determined by the EPS and the bacterial cells respectively (Murugan *et al.*, 2016).

Biofilms have water channels which transport the essential nutrients and oxygen to internal cells (Alves *et al.*, 2014; Tiwari &

Ghnawate, 2017), and remove the waste products and toxins from the cells. Extracellular matrix facilitates communications among the microbial cells via biochemical signals (Tiwari & Ghnawate, 2017), such as acyl-homoserine lactone and oligopeptides facilitates communication in gram negative bacteria and gram positive bacteria respectively in an event called as quorum sensing (Maharjan *et al.*, 2018). Also, environmental factors have a major impact on formation of biofilm including EPS production (Murugan *et al.*, 2016; Singha *et al.*, 2017). The mechanisms of how environmental factors influence biofilm formation yet to be justified (Murugan *et al.*, 2016).

Pathogenesis and Antibiotic Resistance Mechanisms of Biofilms

Biofilm develop on the surfaces of living tissues such as the urinary bladder and abiotic surfaces generally in indwelling devices (Bardoloi & Yogeesh Babu, 2017). Biofilms are considered as one of the serious medical threats to patient's health as the matrix prevent the pathogenic microorganism against the host defense mechanism (Sayal *et al.*, 2014 ; Maharjan *et al.*, 2018) and its unique characteristics enable intrinsic resistance to antibacterial drugs. Biofilm associated bacteria acquire 100- to 1000-fold increase in antibiotic tolerance compared to planktonic bacteria (Murugan *et al.*, 2016). Bacteria become more resistant after adhering to the surface and subsequently develop more resistance over the following days of biofilm production (Tiwari & Ghnawate, 2017).

Generally biofilm consists of multi drug-resistant bacterial species separated by interstitial fluid (Alves *et al.*, 2014; Bardoloi & Yogeesh Babu, 2017). Biofilm also consists of gram positive bacteria such as *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Enterococcus faecalis* and Gram negative bacteria such as *Escherichia coli*, *Klebsiella pneumoniae*, *Proteus mirabilis* and *Pseudomonas aeruginosa* (Patel *et al.*, 2016 ; Bardoloi & Yogeesh Babu, 2017).

Biofilm bacteria exhibit different antibiotic resistant strategies than the normal pathogenic bacteria, and the resistance techniques depend on the slow penetration of the antibiotics,

different rates of bacterial growth and metabolism as well as horizontal transmission of drug-resistant gene between the closely attached cells (Alves *et al.*, 2014; Tiwari & Ghnawate, 2017 ; Maharjan *et al.*, 2018). Also, biofilm bacteria have the ability to form unique subpopulation like spore formation. The subpopulations have different phenotypes and persist in a dormant state which are highly resistance to antibiotics and cause recurrent infections (Murugan *et al.*, 2016; Singha *et al.*, 2017). In addition to that, the biofilm matrix consists of concentrated extracellular enzymes including formaldehyde dehydrogenase, formaldehyde lyase and β -lactamases. The enzymes are capable of inactivating the hydrophilic positively charged antibacterial substances (Murugan *et al.*, 2016).

A knowledge of biofilm formation and antibiotic resistance profile of bacterial species are critical to find new techniques for therapeutic use. Since the biofilm bacteria is highly resistance to antibiotic, there are considerable drawbacks in the treatments of patients with this type of infection (Osungunna & Onawunmi, 2018; Sayal *et al.*, 2014). Especially, antibiotic resistivity against commonly used antibiotics for the urinary tract infection has been increasing worldwide. It was found that the resistance pattern may vary with the bacterial stain (Murugan *et al.*, 2011). According to the reports from different countries, drugs Colistin, Ofloxacin, Fosfomycin, Vancomycin, Meropenem, Imipenem, Piperacillin and Tazobactam remain as the antibiotic of choice in the treatment of biofilm infections (Dumaru *et al.*, 2019; Maharjan *et al.*, 2018; Osungunna & Onawunmi, 2018; Sabir *et al.*, 2017). On account of antibiotic resistance pattern, the highest resistance was observed with Ampicillin and Ceftazidime, followed by Amoxicillin Clavulanate and Tetracycline (Maharjan *et al.*, 2018; Sabir *et al.*, 2017).

Biofilm in Indwelling Urinary Catheters

Indwelling medical devices support to increase therapeutic results of patients, particularly those requiring life supporting devices and protect their lives, however these devices are more prone to

get colonization of biofilm bacteria (Dror *et al.*, 2009 ; Alves *et al.*, 2014 ; Bardoloi & Yogeesha Babu, 2017). About 30% of biofilm producing bacteria have been identified from indwelling medical equipment including endotracheal tubes, central venous catheters and urinary catheters. Among the medical devices, indwelling urinary catheters are known to be the major common site of biofilm producing bacteria (Patel *et al.*, 2016 ; Bardoloi & Yogeesha Babu, 2017). The bacteria can originate in the inner or outer part of the device (Sayal *et al.*, 2014). The time needed for the biofilm to be produced on the device is based on the bacterial group and the type of device material. But a day is enough to produce a thick biofilm on the complete surface of a polymeric device (Alves *et al.*, 2014; Maharjan *et al.*, 2018).

Urinary tract infections play a major part in hospitalized infections and nearly 97 % of the cases were related to urinary catheters. About 60 % of infections developed due to the presence of biofilm (Alves *et al.*, 2014). Generally during initial admissions at hospitals, around 12 to 16% of adult inpatients have an indwelling urinary catheter (Maharjan *et al.*, 2018). Almost 50 % of catheterized patients acquire infections within a period of less than one week. Patients catheterized for nearly 4 weeks have a 100 % possibility of getting infections (Alves *et al.*, 2014). A study carried out in India indicates that *E.coli* (29.74%) was the most commonly isolated followed by *K. pneumoniae* (21.84%), *P. mirabilis* (15.42%) from the urine samples of patients with indwelling urinary catheters (Sayal *et al.*, 2014).

If the urinary catheter is inserted in the same area for a longer period, it increases the likelihood of these microorganisms producing biofilms and results in chronic and recurrent urinary tract infections (Sayal *et al.*, 2014). If the infection is not treated, it may consequently lead to bacteraemia, bacterial vaginosis, chronic renal infection, acute pyelonephritis, bladder cancer and in certain cases death (Alves *et al.*, 2014).

Crystalline Biofilm Formation in Urinary Catheters

Bacteria use the catheter as a pathway to enter into the bladder (Tiwari & Ghnawate, 2017). Urease is an enzyme produced by

bacteria which are colonized in the urine of catheterized patients (Stickler, 2014). *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, *Morganella morganii*, *Proteus* species, some *Providencia* species, *Staphylococcus aureus* and coagulase-negative *Staphylococci* produce urease in urine and form a unique type of crystalline biofilm on catheters (Stickler, 2014; Tiwari & Ghnawate, 2017). Especially, *Proteus mirabilis* is the most common bacteria which forms crystalline biofilms in the urinary catheters (Stickler, 2014).

Formation of Crystalline biofilms involves in sequences of steps. Initially urease enzyme produced by bacterial species break down the urea in urine and release ammonia. Ammonia increases the pH level of urine and subsequently results in the formation of calcium and magnesium phosphate crystalline. Accumulation of the crystalline materials occurs in the urine that remains inside the catheter lumen and develop rapidly within the biofilm matrix (Broomfield *et al.*, 2009; Stickler, 2014; Tiwari & Ghnawate, 2017). Also the crystalline materials harden and obstruct the lumen of catheter and finally block the urine flow. Blockage of urine flow results in painful bladder distension and if the urine from the distended bladder refluxes into the kidney, it causes pyelonephritis (Stickler, 2014; Tiwari & Ghnawate, 2017). However, if the particular causative agent is not identified it can make the disease more severe and in some cases, it can be fatal (Alves *et al.*, 2014). All available catheter types are vulnerable to encrustation and blockage including silver or nitrofurazone-coated ones (Stickler, 2014). High morbidity and the mortality rates of catheter associated urinary tract infection increase the hospital stay and cost of the treatment (Maharjan *et al.*, 2018).

Detection Methods of Biofilm

Conventional methods are economical and reliable for the routine screening and diagnosis (Dumaru *et al.*, 2019). Biofilm can be easily demonstrated by phenotypic methods such as tube method, Congo Red Agar (CRA) method and tissue culture plate method. Besides that genotypic methods have also been carried out to screen biofilm production as indirect proof of the presence of

biofilms (Bardoloi & Yogeesh Babu, 2017). Molecular methods considerably widened a spectrum of microbes detected in biofilms. The Modern Next-Generation Sequencing (NGS) techniques is beneficial in studying highly diverse bacterial communities (Kotaskova *et al.*, 2019). NGS targeting 16S rDNA is able to analyse the bacterial composition in catheter related infection and therefore it is suggested as a promising diagnostic tool for catheter related infections (Okuda *et al.*, 2018).

The new test methods are currently used for biofilm detection such as DNA based methods including quantitative real time PCR, multiplex PCR, Sanger sequencing, next generation sequencing and micro array analysis. Further, confocal scanning, laser microscopy with molecular probes, Fluorescence In Situ Hybridization (FISH) or labelled antibodies-electron microscopy are used to detect biofilms (Magana *et al.*, 2018; Petrachi *et al.*, 2017). Virulence genes responsible for biofilm formation can be amplified with the usage of gene specific primers, even in the uncultured pathogen present in the sample (Kirmusaoğlu, 2019). Researches who worked with biofilm structures have identified virulence genes responsible for biofilm formation such as *cup A* gene in *P. aeruginosa*, *ica* gene in *S. aureus* and *esp* gene in *E. faecalis* (Falaki & Mahdavi, 2017; Murugan *et al.*, 2016; Pérez-Osorio *et al.*, 2010). 16S rDNA sequencing is the most common housekeeping genetic marker to identify bacterial species. 16S rDNA molecule among various bacteria have highly conserved nucleotide sequence interspersed with regions of more variables that are specific to genes or species (Jenkins *et al.*, 2012; Kai *et al.*, 2018; Kotaskova *et al.*, 2019; Maciel *et al.*, 2009). Each bacterial species has its unique 16S rDNA sequences with differences (<0.5%) (Janda & Abbott, 2007). Phylogenetic analysis using 16S rDNA sequences is considered to be a highly reliable and important bioinformatics tool (Roy *et al.*, 2014; Yang *et al.*, 2016).

Phylogenetic is the study of the evolutionary relatedness among groups of organisms. Molecular phylogenetic uses sequence data to infer these relationships for both organisms and the genes they maintain (Ziemert & Jensen, 2012). Evolutionary relationship

among the biofilm bacterial species are determined by phylogenetic analysis (Murugan *et al.*, 2016). Phylogenetic tree is a branching diagram where the simple tree representation of the evolution makes the phylogenetic analysis easier to comprehend and represent as well (Roy *et al.*, 2014).

Effective Strategies and Novel Approaches to Prevent Biofilm Formation

Nowadays mortality rates increase and there is an urgent requirement to develop strategies to prevent and eradicate biofilm production on urinary catheters (Alves *et al.*, 2014). In this standpoint, early detection of biofilm producers is crucial (Maharjan *et al.*, 2018). Also analysing the biofilm development with regard to age, gender, hospital unit, bacterial species (Alves *et al.*, 2014) and their antibiotic susceptibility may provide a wide knowledge regarding treatment and prevention of such infections (Sayal *et al.*, 2014). Several studies indicate that microbial studies alone will not eradicate CAUTIs (Singha *et al.*, 2017). In order to meet all the challenges of catheter associated infection, development of an alternative indwelling catheter system is an important requirement which should have the same mechanism as natural physiology of urine elimination and emptying urine completely without damaging the bladder and appropriate for all users (Feneley *et al.*, 2015). Researchers need to understand the interaction between the pathogens and materials with regard to development of infection. The necessity for better catheter materials has significantly increased (Singha *et al.*, 2017).

A research study reports that Azithromycin-Ciprofloxacin-impregnated urinary catheters inhibit bacterial colonization, biofilm formation, and inflammation in a murine model of foreign-body-associated urinary tract infections caused by *Pseudomonas aeruginosa* (Saini *et al.*, 2017). Another research study indicates that silver-polytetrafluoroethylene (Ag-PTFE) coated catheters substantially inhibit encrustation compare to uncoated ones. Currently coated catheters which are effective for long term catheterization are commercially not available. Silver has antibacterial properties

(Singha *et al.*, 2017). Silver coated catheters are available in the market, but antibacterial properties of them are inactivated due to the sticky biofilm formation on the extra luminal part of the catheters. PTFE has an excellent non-stick properties and hence it is suggested that the Ag-PTFE would be a promising antibacterial coating for urinary catheters (Wang *et al.*, 2019). Research on Antifouling and biocidal materials would be most useful in designing competent and simple catheters. Antifouling coatings have the ability to prevent bacterial attachment to the surfaces, whereas biocidal materials kill the pathogens. Silver ions, Triclosan, Chlorhexidine, Chlorine, Tributyltin and Nitric oxide are the chemicals which show biocide activity (Singha *et al.*, 2017). It has been proven in a research study that Chlorhexidine sustained-release varnish-coated urinary catheters efficaciously reduce urinary catheter-associated biofilm formation (Segev *et al.*, 2013).

Besides that, discovering natural agents could provide novel strategies for catheter associated biofilm infections. Research reports from various countries indicate that significant amount of plant species have anti-bacterial and anti-biofilm activity. Garlic shows inhibitory effect in quorum sensing mechanism which plays a vital role in biofilm formation in bacteria. Moreover, plant *Cocculas trilobus* has the ability of blocking the adherence of bacteria onto surfaces. As well as Cranberry Polyphenols, *Herba parrinae* extract, and *Ginkgo biloba* extract have strong inhibitory effects on biofilm formation (Lu *et al.*, 2019). Furthermore it is proved that catheters impregnated with herbal plant powders including *Andrographis paniculata*, *Euphorbia hirta* and *Terminalia chebula* have antibiofilm activity. Seeking novel antimicrobials from ethnomedicinal plant may provide a new pathway for preventing biofilm infections (AnilKumar, 2015).

Conclusions

Almost all cases of CAUTI are biofilm-related infections (Bardoloi & Yogeesh Babu, 2017). Biofilms and their control procedures have been mentioned in several aforementioned studies and

complications of biofilm are thought provoking and which raises serious concerns (Maharjan *et al.*, 2018). Understanding the nature of biofilm and their connection with the environmental factors may help to discover treatment and management methods for CAUTI (Murugan *et al.*, 2016). In Sri Lanka, even though few works have been reported on utilizing the beneficial effect of biofilm bacteria (eg: biofilm biofertilizers) in the field of agriculture (Herath *et al.*, 2013), there are lack of research done on biofilm infection in health-related field.

Diagnosis and the prevention methods of catheter associated urinary tract infection require expertise, facilities and surveillance activities. Due to inadequate surveillance and reporting system, magnitude of catheter associated UTI has been underestimated and developed into a common problem in the developing countries. Lack of knowledge with regard to development of microorganisms in biofilms lead to slow progression of detecting biofilms in medical devices (Awoke *et al.*, 2019). Therefore, research related to catheter associated biofilm is most important and it will raise the awareness of this condition to the general public of Sri Lanka.

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A Critical Evaluation of the Ownership and Responsibilities of Early Childhood Care, Development and Education in Sri Lanka

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Abstract

The Early Childhood Care and Development (ECCD) and Education in Sri Lanka have been considered vital for human development (UNICEF, 2007 cited in Gallardo, 2009). Yet, there is less attention paid to the scrutinised formulation of policies related to this aspect in Sri Lanka. Furthermore, child-related studies conducted in Sri Lanka are limited. This paper aims to contribute to this necessity by conducting a critical evaluation regarding the responsibility of the formulation of ECCD and education policies in Sri Lanka. A qualitative research design was used for this study. Thirteen policy documents related to ECCD and education were critically analysed and interviews were conducted with responsible informants of ECCD and education in order to gather data. The findings exhibited that there was no single designated authority that is responsible for the formulation of policies related to ECCD and

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education in Sri Lanka. Furthermore, it was noted that the responsibility of ECCD and education-related policy formulation constantly shifted from one authority to another. In addition, it was noted that the responsibility regarding the formulation of policies for different aspects of ECCD and education were delegated to different parties. Lack of coordination among these diverse parties had resulted in no clear-cut policies for any of the aspects of ECCD and education. Furthermore, lack of supervision and monitoring had resulted in the non-implementation of the prevalent ECCD and education policies in Sri Lanka. Hence, the requirement for stern and stable ECCD policy formulating and monitoring agents is highlighted in the present study.

Keywords: ECCD, education, ownership, responsibility, policies

Introduction

Sri Lanka has a long history of attempts to provide education for all its citizens. Yet, there has been a limited attention towards Early Childhood Care and Development (ECCD) and education of children who are below the age of 5 years. Even though the concept of formal education originated in the world around the 13th century, the attention to early childhood education and care started later during the 1800s.

Even though ECCD and education are the responsibility of the Children's Secretariat, it appears that many governmental (i.e. NIE, Ministry of Education) and non-governmental organisations (i.e. UNESCO, ARNEC) contribute in developing and maintaining the ECCD in Sri Lanka. These organisations issue different types of policy documents and recommendations for the maintenance and the evaluation of ECCD and education in Sri Lanka. Even though there are policies and regulations available in Sri Lanka regarding ECCD and education, there is no accepted and comprehensive policy targeting early childhood care, development, education and language of the children in Sri Lanka. Moreover, the availability of the policies is limited and there are contradictions in the available policies. Furthermore, there is no identifiable authoritative body which is responsible for ECCD and education in Sri Lanka. Yet,

there are implicit policies which are operating in the ECCD centres in Sri Lanka.

This study aims to review the available policy documents from 1986 to 2019 on ECCD and education in Sri Lanka which were presented by different institutions. Moreover, this study objectifies the ambiguities prevalent in the available policies and attempts to attract the attention of the responsible authorities to this issue. In addition, this study will present a critical evaluation of the delegation of responsibilities regarding ECCD and early childhood education in the country.

Literature Review

Early Childhood Care and Development and Education

Building a solid basis for healthy development in the early years of life is a requirement for better societies around the world (Shonkoff et al., 2012). Early childhood is a critical period in human development. The first few years are considered as a sensitive period in children's cognitive, behavioural, social and physical development (Gowani, 2014). UNESCO defines early childhood as the period from birth to 8 years (UNESCO, 2009 cited in Gallardo, 2009). Knudsen et al. (2006), cited in Elango (2015), argue that antagonistic early childhood environments and experiences create an impact on the human for over a lifetime. Hence, there is a growing necessity and an increasing recognition for early childhood programmes and policies around the world. Boocock (1995) states that, though there is a growing interest for the preschool programmes in the world, preschool facilities and services are not evenly distributed around the world or within countries. He further mentions that "the overall availability and quality of preschool programmes tend to be much higher in rich industrialised nations than in poor developing ones...." (p.95). It is evident that there is an interest among the nations on ECCD even though the developing nations are unable to provide quality early education when compared to the developed ones.

The advancement of early childhood care, development and education depends on the availability of the resources and programmes for children as well as for teachers. As Britto et al. (2011) state, the Conafe preschool programme in Mexico provides rigorous training for teachers who have comparatively low educational qualifications. Simon et al. (2015) state that in Britain, at least fifty percent of the childcare workforce should be qualified to at least NVQ level 3. Boocock (1995) further positions that French preschool teachers have the same training, same acceptance and salary as French primary school teachers. In contrast, Simon et al. (2015) state that childcare workforce sector is paid low when compared to other occupations in Britain. As Hunzai (2009) affirms, the preschools in Pakistan appoint less academically and professionally qualified teachers because the accepted belief is that teaching younger children is easy and thus, they do not need trained teachers. These findings depict that different countries and nations around the world have different opinions regarding the teachers who teach the young children. As mentioned before, early childhood education is considered as important as formal education. Hence, teachers with similar qualifications and experiences are necessary to teach young children.

Moreover, Lobman et al. (n.d.) conducted a study on reconstructing teacher education to prepare qualified preschool teachers. They state that, even though there is a high demand for preschool teachers, the wide range of rules and regulations regarding the baseline of education needed to be a preschool teacher (Ackerman, 2004 cited in Lobman et al. (n.d.)) have caused a potential shortage of teachers. In contrast, Boocock (1995) indicates that the average number of learners in a preschool classroom in France is 25 where one teacher is allocated for 25 children.

There are variations among the countries when considering the admissions and the availability of ECCD programmes for children. Boocock (1995) comments that in France and Belgium almost 100% of the children are enrolled in preschool programmes compared with 28% of Spanish and Portuguese children of that age. Yet, only about 50% of the children are enrolled in schools in

India and even that 50% do not complete the first year. There is a huge tendency in India for children to drop out from school because of child labour and especially, female children stay at home to take care of their younger siblings (Boocock, 1995). On the contrary, Boocock (1995) affirmed that in Japan, Singapore, South Korea, Hong Kong and Taiwan most children attend preschool by the age three. Yet, the preschool programmes focus on molding children according to the academic demands of the school. According to Hunzai (2009), in Pakistan, education is divided into two sectors as public and private. It is revealed that there is a huge difference in the quality of education between the sectors, which has created a lot of problems and issues related to providing quality education to young children. Hunzai (ibid) recommends that the government of Pakistan should focus on a number of basic areas in order to develop the effectiveness and productivity of the early childhood education.

There are many governmental and non-governmental institutions that are interested and have tried to create policies for early childhood care and education. In Britto's (2011) perspective, Early Childhood Development (ECD) programmes have become a great interest to policymakers, service providers, and families as they have identified that it is an important aspect in human development. A study on policies on Early Childhood Care and Education and their evolution by Vargas-Barón (2014) states that "National ECCE policies are multisectoral" (p.1) and that they focus on the sectors such as education, health, nutrition, sanitation and protection. She further points out that the six countries in South Asia have formulated or adopted multisectoral ECCE policies. Yet, the researcher has not mentioned the names of the countries which have adopted and formulated these multisectoral policies. The organisations such as UNESCO, UNICEF, ARNEC, The Aga Khan Foundation, the Asian Development Bank and various other international and national Non-Governmental Organisations (NGOs) are engaged in developing ECCE in the South Asian Region. Yet, the researcher mentions that there are challenges of implementing ECCE policies in this region. She suggests that a

lead ministry should be established and it should engage in the policy planning and coordination with other ECCE ministries.

The early childhood policies in the developed countries display ambiguities since there are no administration and evaluation policies. Pianta, Cox, & Snow (2007) cite a study by Mashburn et al. (2008) on the development of academic, language, and social skills of 4-year-old children in publicly-supported prekindergarten (pre-K) programs in the USA which state that, policies determine many features of preschool programs in their country. “Who is eligible to attend the preschool, minimum qualifications of teachers, additional services that are available to children and their families, the amount and types of teacher professional development and approaches to monitoring programme and classroom quality” (p.732) are determined by the early childhood care and education policies of the particular country. Yet, the researchers point out that there is “no singular definition for or method of evaluating pre-kindergarten (pre-K) quality” (Lamb, 1998; Phillips & Howes, 1987; Vandell & Wolfe, 2000 cited in Mashburn et al., 2008) (p.733). Though the policies seem to be stern and rigid, there seem to be ambiguities in policies.

The language that should be used in educating young children should also be considered critical as the early years of life are crucial in the development of humans. Most of the policy makers around the world have neglected the aspect of language in the process of formulating of policies for ECCD and education. A study conducted by Owodally (2012) employing a case study approach, reveals that there is a complex language situation in the preschools in Mauritius. The subjects of this particular study use Mauritian Creole as the home language while English is the medium of written instructions at primary schools and French is taught at schools. Hence, the teachers are free to employ one of the above languages in the preschool. The researcher points out that this is due to the lack of a proper policy for language in education for preschools.

Similarly, Beauchamp (2016) conducted a research in New Zealand to study how the minority language children acquire English while

attending preschools. The study showed that the teachers lack experience and professional practices in teaching the children who are not first language speakers of English. There is no specific guidance through policies as to how the the children of minority communities should be taught in the preschools.

Furthermore, a study conducted by Ivey (2011) illustrates the language barriers that Hispanic children have to face in schools in the USA. The USA has passed an Act called No Child Left Behind in 2002. This Act states that the curriculum instructions should be provided in English. As there are many languages and cultures that students bring to the classroom, the detachment between school and home of these Hispanic learners deepen more and more. This is mainly due to the inadequacy of the policies of the country which are not inclusive when it comes to to minority communities.

The studies mentioned above depict that there are concerns pertaining to ECCD and education in the global context. The following section will present the situation of ECCD and education in Sri Lanka.

Early Childhood Care and Development and Education in Sri Lanka

In Sri Lanka, early childhood is defined as the period of child's life from conception to age five (Ministry of Education, 2008 cited in Gallardo, 2009). Yet, according to Pathirana (2017a), early childhood could be considered as the period from birth to 8 years. Salaswicz & Perry (2010) and UNICEF/UNESCO (2012) cited in Pathirana (2017a) consider that early childhood is a critical and a profound period of human development.

Early Childhood Care and Development and Education in Sri Lanka started with the initiation of a few urban preschools in the 1920s. According to Pathirana (2017a), in 1972, *Sarvodaya*, an NGO involved in community development, carried out preschool activities throughout Sri Lanka. Wijetunge et al. (2003) cited in Pathirana (2017a) states that Lanka *Mahila Samithiya* also had a role to play in the provision of preschool facilities in both rural and urban areas.

While early childhood development is not officially a part of the Sri Lankan general education system, policy makers have recognised the importance of integrating early childhood development into the system (Gallardo, 2009).

Pathirana (2017a) mentions that “the government of Sri Lanka has not been enthusiastic or fervent about shouldering the total responsibility of ECCD” (p.38). She further mentions that the state’s contribution to ECCD is ambiguous and preschools are administered and “more or less carried out” (...) as a small business or charity (p.38). In addition, Pathirana (2017a) concludes that the economic constraints appear to be the barrier limiting the government’s assistance to the ECCD.

A study which presents a profile of Early Childhood Care and Education (ECCD) in Sri Lanka by Pathirana (2017b), indicates that only a few preschools follow a child centered, activity-based curricula endorsed by ECCD experts. It further presents that many preschools in Sri Lanka were reported to teach the curricula taught in primary schools.

Herath et al. (2013) focused on the assessment of the quality of childcare centres in the Colombo Municipal Council (CMC) area and found out that the quality of care provided by child care centres in the six Medical Officers of Health (MOH) areas of CMC area were mediocre. Furthermore, Gallardo (2009) studied on the peace development through the Sri Lankan early childhood education and provided recommendations on how to orient the early childhood programmes towards peace development. Moreover, this study provides policy recommendations pointing out how the policies should be altered to enhance peace. Pathirana (2012) focused on ensuring harmony and protection in preschool education. Furthermore, Pathirana (2017c) conducted a study on Early Violence Prevention in Sri Lankan Preschools.

Therefore, it is evident that there is a dearth of research in the policies regarding the ownership and responsibilities of ECCD and

education in Sri Lanka. Further studies are needed to fill the gap in the education policies related to early childhood education.

Methodology

Denzin & Lincoln (2005), cited in Creswell (2007), state that qualitative researchers use qualitative research design to study their natural settings. Hence, it is evident that qualitative research designs interpret the results in its own environment rather than the researcher creating or imposing a force in the results. Furthermore, Creswell (ibid) states that qualitative researchers collect data through examining and analysing documents, observing the behaviour of the research sample and interviewing participants.

Similarly, a document analysis and interviews with responsible informants of ECCD and education in Sri Lanka were conducted in attempting to provide a critical reading on the ownership and responsibility of ECCD in Sri Lanka. Furthermore, the researcher attempts to bring forth the attention of the responsible authorities on the ambiguities of the present policies regarding ECCD and education in Sri Lanka. The available policy documents related to early childhood care and development, language and education in Sri Lanka were analysed and the findings were coded accordingly. The data collected from the informants were audio recorded and were supported by the researcher's hand-written field notes and other supplementary notes. As the informants used Sinhala in providing information, the data collected through the informants were transcribed and relevant sections from the data were translated into English by the researcher shortly after the meetings had taken place.

As policies are public documents and they should be available to the general public, no special permission was necessary to gather information from them. However, the researcher ensured that the rights of all informants were safe guarded. The researcher received consent and permission from each informant before seeking information. The informed consent of all informants was delivered to the researcher prior to the beginning of this study which also

allowed for voluntary participation from all the informants while assuring their privacy and anonymity.

Documents and Textual Analysis

Initially, the identification of the policy documents related to ECCD was conducted through an internet search. Furthermore, the information gathered through the informants led to the identification of more relevant policy documents.

Some policy documents were found with great difficulty even though these policy documents and recommendations should be available for the general public (this issue will be further addressed in section 04). The researcher located a few of the policy documents through a personal contact. The contacted official who works in a state institution had to use the official networks to obtain these policy documents. A total of 13 policy documents were located on Early Childhood Care and Development and Education.

This study focuses on those 13 policies which range from 1986 to 2018.

Informants

This study focused on institutional spaces related to ECCD policy planning and implementation. Therefore, no specific physical setting could be mentioned as particular to the study. However, information was sought by people who are in responsible roles regarding these policies. These informants were administrative personnel at the Children's Secretariat in Sethsiripaya, Battaramulla, administrative personnel at the ECCD unit in Kandy and two teachers from an early childhood development centre in Kandy.

Findings and Discussion

Policy documents related to ECCD

The researcher identified 13 policy documents related to ECCD for the analysis and they are presented in Table 1.

Table 1. Policy documents related to Early Childhood Care and Development, Language and Education

	Policy documents	Year of Issue	Issued By
01.	Early Childhood Care and Development in Sri Lanka	1986	Report of the National Committee of Inquiry on the young children
02.	An Action Oriented Strategy towards a National Education	1995	National Education Commission (NEC)
03.	National Policy (1997)/ Reforms in General Education (1997)	1997	National Education Commission (NEC)
04.	Proposals on General Education	2003	National Education Commission (NEC)
05.	National Policy on Early Childhood Care and Development	2004	Children's Secretariat
06.	New Education Act for General Education in Sri Lanka	2005-2010	National Committee for Formulating A New Education Act for General Education
07.	Early Childhood Development Charter no. 03 of 2015	2015	Government
08.	Guidelines for Early Childhood Care and Development Centres	2017	Children's Secretariat
09.	Proposals for a National Policy on General Education in Sri Lanka	2016	National Institute of Education (NIE)

10.	Minimum Standards for Early Childhood Centres	2016	ECCD unit, Central province
11.	The Country Profile	2018	The Asia Pacific Regional Network for Early Childhood
12.	National Policy on Early Childhood Care and Development	2018	Children's Secretariat
13.	Corporate Plan for Early Childhood Care and Development	2019	ECCD unit, Central province

Ownership and responsibility of ECCD

ECCD in Sri Lanka was handled by different sectors and organisations since its initiation in the country. During 80s, ECCD in Sri Lanka was a shared responsibility among many institutions. The first policy document, Early Childhood Care and Development in Sri Lanka (1986), does not specify a unique body as responsible for ECCD in Sri Lanka. Moreover, the policy document confirms that there is no special authority or an institute which is given power of policy making and the provision of ECCD. "There is no precedent in Sri Lanka of a single agency charged with the development of policy for the provision of care and education services for the young children" (p.11). Furthermore, the document states that the past governments were not enthusiastic about the provision of welfare to the young children. This policy document proposes a delegation of responsibilities to the Children's Centres with the supervision of the local community and Gramodaya Mandalas. Furthermore, it was recommended that there should be National Committees, District Committees and Support Centres for ECCD in Sri Lanka. The District and National level committees would be engaged in planning and management of the ECCD.

Furthermore, this policy document provides a list of government institutes and International and Non-Governmental Organisations (I/NGOs) which facilitated the provision of ECCD in Sri Lanka. It also includes the activities carried out by these institutions. For

instance, UNICEF, Janatha Estate Development Board, State Plantation Corporation, Ministry of Social Services, Colombo Municipality, Ministry of Local Government, Housing and Construction, Ministry of Fisheries, *Sarvodaya*, *Lanka Mahila Samithi* and Mahaweli Authority. In addition, this states that teacher training will be provided by The Open University of Sri Lanka (OUSL). Henceforth, it is evident that, in the beginning, the responsibility of the ECCD in Sri Lanka was a joint endeavor and no single authoritative body had undertaken its responsibility during this time.

Yet, during the 90s, there is a noticeable deviation of the responsibility from the government sector. It states that “since 1945 the country is committed to a policy of free education from Kindergarten to the University” (para. 19). However, this policy document states that NGOs are requested by the Divisional Secretariats to set up pre-schools. Hence, it is evident that the government did not take the responsibility of ECCD programmes during this period. Nevertheless, it is doubtful whether the provision of “free” education at the kindergarten level happened during this time period (para. 19). The question whether the preschools were solely operated by the NGOs at that time and also which NGO handled the responsibility of preschools and ECCD are unknown. As mentioned in literature, according to Pathirana (2017a), in 1972, *Sarvodaya*, a Non-Government Organisation carried out the preschool activities throughout Sri Lanka. Wijetunge et al. (2003) cited in Pathirana (2017a) state that *Lanka Mahila Samithiya* also had a role to play in the provision of preschool facilities in both rural and urban areas. Yet, in the first policy document (Early Childhood Care and Development in Sri Lanka, 1986), this institution was not mentioned in relation to the provision of ECCD in Sri Lanka. It is not apparent whether only these two NGOs are the ones that shouldered the responsibility of the provision and maintenance of the ECCD facilities up to 1995. In addition, none of the policy documents (after 1995) mentions that these two NGOs or any other specific NGO were responsible for the ECCD in Sri Lanka. Hence, it is possible that those two NGOs eventually withdrew or were forced to withdraw from the responsibility of the provision of ECCD and education in Sri Lanka.

Furthermore, the very same policy document states that “pre-schools will not be operated by the State. However, the government may provide facilities for training of teachers and regulate them for the maintenance of minimum standards in pre-schools” (para. 46). Yet, the policy document had a clause mentioning that the country is committed to provide free education from the kindergarten. Hence, it presents a contradiction in the same document, about the responsibility, where at first, the policy document mentions that the government provides free education and later the same policy document mentions that the state does not take the responsibility for early education. There is no clear rationale regarding the handing over of the duties to the NGOs by the government and conducting the training programmes by the government. This policy document does not specify the role of the government regarding the ECCD. The policy document lacks clarity on the government participation in sharing the obligations regarding the ECCD: it simply states that “the government may provide” training. Furthermore, the ground reality of whether the preschool teacher training actually happened is unknown. Moreover, in the previous document it was mentioned that OUSL will provide teacher training. Yet, it is not mentioned here whether the same institution is the responsible party for the provision of teacher training. Furthermore, the NGOs (as mentioned earlier) were requested and provided with the responsibility by the Divisional Secretariats to set up (set up? I also encountered this earlier. Pls consider revising) preschools.

Even though the Children’s Secretariat (under the Women’s Bureau in Sri Lanka) was established in 1978, the NGOs and other governmental institutions were given power to handle ECCD even in the year 1995. It is evident that after more than a decade, the government was not able to take a proper decision regarding the responsibility and the ownership of ECCD. Hence, it is evident that there is a shift in the responsibility of ECCD and education from the government towards a few NGOs. Yet, at present, the status and the recognition given to NGOs, which were authorised figures in 1995 has changed and the NGOs have become only a partner in the ECCD.

The policy document issued in 1997, states that the Presidential Task Force Report in 1997 recommended that ECCD and preschools should be taken separately and the subject of ECCD should be handled by the Children's Secretariat (Women's Bureau). Yet, while there is no evidence given as to who undertook the responsibility of preschools, the Children's Secretariat handled the ECCD in Sri Lanka. Furthermore, they did not specify any rationale in dividing ECCD and preschools between the Children's Secretariat and the unknown party who handled the education of the children. In addition, what components of childhood come under the term ECCD is not clarified in this document.

This policy document has clearly demonstrated that the rhetoric regarding the ECCD has changed. It is evident that between 1995 and 1997, there is a shift in the governmental policies regarding the responsibilities of the ECCD. The government has identified the importance of considering ECCD as one of their concerns. Yet, there is no rationale provided for this sudden change or the shift of responsibilities.

As the policy document on the Education Reforms (1997) mentions, the Provincial Councils were encouraged to maintain Early Childhood Care and Development (ECCD) centers. These reforms proposed that the Children's Secretariat should collaborate with the Non-formal Education Division of the Ministry of Education (MoE) to promote ECCD. The Children's Secretariat policy makers have identified that Early Childhood Development and preschools are for two different stages of development and emphasised the setting up of preschools mainly for the children in the age group of 3 – 5. They have proposed incentives to Provincial Councils and local authorities to set up and maintain preschools. Therefore, it is evident that the responsibility regarding the preschools (as advised in the earlier policy document that preschools should be taken separately) was delegated and undertaken by the provincial councils. The document also recommends that there should be a legal framework in respect of the quality of preschool staff, facilities and their supervision. In addition, in this document, the involvement of ministries and the

collaboration among the ministries was requested to uphold and to develop ECCD.

However, there were few alterations in the responsibility regarding ECCD and education in Sri Lanka during the period from 1997 to 2003.

The Proposals on General Education issued in 2003 provide a recommendation that “the National Policy that is being formulated by the Ministry of Social Welfare should be followed by the preparation of a Plan of Action to be implemented in collaboration with, for instance, the Ministries of Education and Health and Provincial Administrations” (para. 35). No alliance among the ministries was evident when undertaking the responsibility of ECCD in maintaining and following the regulations and policies. Hence, this policy document provides such a recommendation imagining that it may support in enhancing the ECCD in Sri Lanka.

Furthermore, it recommends that “all Day Care Centres and Pre-schools should be registered with the Children’s Secretariat” (para.36). This is a contradictory stance as reflected in all the documents issued before this. This is the first instance that the registering of the ECCD programmes and centres come into the discussion and into the policy. It is evident that the policy has been altered within a time period of less than ten years.

This policy document brings more authoritative figures into the discussion of their responsibility. The National Institute of Education (NIE) is recommended as the agency which should collaborate with the Children’s Secretariat in developing flexible guidelines for activities and materials to be used in preschools to achieve desirable outcomes identified to meet child development needs. In addition, this policy document confirms that there is no collaboration among the institutes and ministries which are responsible in ECCD in creating, developing, maintaining and following the regulations and policies and it recommends that the collaboration and assistance are vital in developing ECCD in Sri Lanka. The policy document further recommends that “the state

should prescribe minimum standards for space, physical facilities, equipment and qualifications of teachers” (para. 37) and it recommends that there should be minimum standards for the ECCD in Sri Lanka. Hence, it is evident that a legal framework was not yet been set up even though it was proposed earlier in 1997. Furthermore, it could be concluded that the regulations for the maintenance of the ECCD was inadequate at this time.

Even though, National Policy (1997)/Reforms in General Education (1997) mentions that the Provincial Councils were encouraged to maintain ECCD centers, this policy document states that “all Day Care Centres and Pre-schools should be registered with the Children’s Secretariat” (para. 36). Hence it presents a contradiction among the policy decisions.

Early Childhood Development Charter No. 03 of 2015 was issued by the Central Province in effect to the power devolved to them by the 13th amendment to the Constitution. According to the Children’s’ Secretariat, each Provincial Council should have a similar Charter. Most importantly, this is the only charter that was available for the general public and could be downloaded via the internet. When considering the other Provincial Councils, Western Province confirmed that they do not have such a Charter when contacted. Hence, the mechanism of the operation, regulation and supervision of the preschools, ECCD centres and Day Care centres in this province is not known. Furthermore, it is against the ECCD policies of Sri Lanka. The researcher was able to find Charters of few other provinces such as Southern, Uva and Wayamba. These Charters empower the Provincial Councils to register the ECCD centres under them. This clearly demarcates the shifting of the responsibilities of the ECCD and education towards the Provincial Councils as the registering procedure was earlier the responsibility of the Children’s Secretariat.

Even though the Provincial Councils were given power on registration, the researcher found out that there are ECCD centres operating without registering them under their respective Provincial Council. Hence, it is still evident that the ownership and responsibility is vague as there is no clause in this Charter as to what legal actions will be followed if the ECCD centres are not

registered. Moreover, there is no institution which is given the power to supervise the ECCD centres in the country. Hence, the general public who starts ECCD centres in Sri Lanka would not see the necessity of registering the preschool or the ECCD centres. Proposals for a National Policy on General Education in Sri Lanka (2016) state that the responsibility of Sri Lanka's "overall" childhood development has been delegated to the Ministry of Child Development and Women's Affairs, and health and nutrition to the Ministry of Health while the Ministry of Social Services is responsible for disadvantaged groups. This shows the shift in the responsibility even though this policy document does not specify the kind of responsibility delegated to the Ministry of Child Development and Women's Affairs. Furthermore, the registering procedure is still the responsibility of the Provincial Councils. Therefore, it is evident that the "overall childhood development" (p.37) is not actually under this Ministry as some responsibilities are delegated to Provincial Councils and several other ministries. A divergence of the responsibilities regarding ECCD in Sri Lanka is depicted in the National Policy on Early Childhood Care and Development 2004 and 2017. These two documents present one of the most significant findings about the ownership and the responsibility of ECCD. They have mentioned about ECCD Coordination Committees that operate at the national level, provincial level, district level, divisional level and village level. The constitution in each Coordination Committee is different from one another. For instance, the National Coordination Committee (NCC) consists of 10 members including the (i) Secretary of the Ministry of Women's and Children's Affairs, (ii) Director of the Children's Secretariat, (iii) an executive level officer appointed from the ministries such as Health, Social Services, Policy Planning and Economic affairs, Local government and Provincial Councils, Justice/Law and Order, Home Affairs and Disaster Management, (iv) Director of Family Health Bureau or a responsible officer appointed by the Director, (v) Commissioner of the Department of Probation and Child Care or a responsible officer appointed by the Commissioner, (vi) Chairperson of the Child Protection Authority or a responsible officer appointed by the Chairperson, (vii) Heads of Provincial entities established in the provinces for ECCD/Preschool education or a relevant executive level officer

appointed by the Provincial Secretary, (viii) Director General of the Plantation Human Development Trust or a relevant officer appointed by the Director General, (ix) two members to represent NGOs/INGOs/UN agencies and private sector organisation who offer ECCD services and (x) two experts in the field of ECCD who possess academic qualifications as well as research experience in the field of ECCD while the Provincial Coordination Committee (PCC) consists of the Chief Secretary of the Province, Head of the establishment instituted for monitoring and supervision of ECCD/Preschool education in the Province, a responsible officer from the Provincial Ministry of Health/Director, Provincial Health Services, an executive level officer from the Provincial Ministry of Education/Provincial Director of Education, Provincial Commissioner of Probation and Child Care, Provincial Director, Social Services, Commissioner of the Local Government, An executive level officer from the Police Department, a representative from the Plantation Human Development Trust, a staff officer from the Children's Secretariat, ECD Officers/Assistants of the relevant districts and three members appointed by the Chief Minister of the Province to represent NGOs and Private sector organizations involved in ECCD. This lengthy syntax needs a revisit—the ten members are unrecognizable in this maize)

Furthermore, there are differences in the composition of these committees in the years 2004 and 2017. For instance, there were two chairpersons in the NCC 2004: secretaries of the Ministry of Women Empowerment and Social Welfare and the Ministry of Health, Nutrients and the Uva Wellassa Development. Yet, in the 2017 NCC, there was only one chairperson, Secretary of the Ministry of Women and Child Affairs. There are differences noted in the other members as well.

When considering the NCC and the constitution of the NCC 2017, the selection is not clearly mentioned. The 9th member category of the NCC is mentioned as “two members to represent NGOs/INGOs/UN agencies and private sector organization who offer ECCD services” (p.20). Yet, it is not clearly mentioned whether there are two members to represent each category

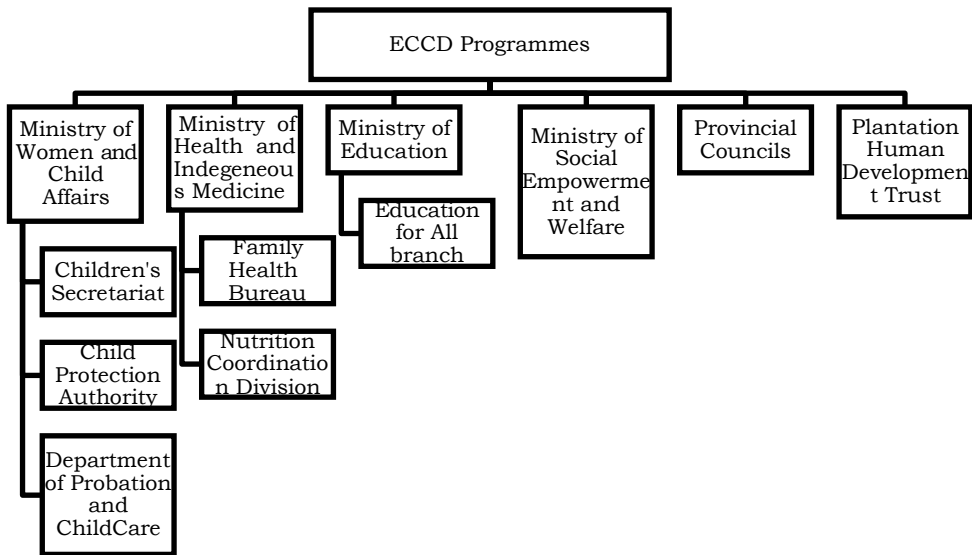
(NGOs/INGOs/UN) or there are two members to represent every organisation.

Furthermore, the 10th member category in the NCC on ECCD, is vague. The 10th category states that “two experts in the field of ECCD who possess academic qualifications as well as research in the field of ECCD” (p. 20). The criteria in appointing these experts and the person responsible in appointing this category is not mentioned in the policy.

When considering the Ministries that represent the NCC on ECCD, it is different to the responsible ministries mentioned in the beginning of the policy document. The responsible ministries, as mentioned in the policy document are, Ministry of Women and Child Affairs, Ministry of Health, Ministry of Education, Ministry of Social Empowerment and Welfare, and Plantation and Human Development Trust. A member representing the Ministry of Policy Planning and Economic Affairs, Justice/Law and Order and a member representing the Ministry of Disaster Management are included in the NCC. Yet, these three ministries are not considered in the category of responsible ministries. This depicts that Ministry of Women and Child Affairs which created this policy document did not identify the responsible ministries precisely. It shows that Ministry of Women and Child Affairs was also in a dilemma when assigning the duties to the responsible authorities.

This policy document presents the Ministries responsible in ECCD and it is depicted in Figure 1 below. It shows that the duties and ownership of ECCD is divided among diverse parties. It is created according to the information gathered through the National Policy on Early Childhood Care and Development 2004 and 2017 as well as through the informants.

Figure 1. Ownership and the Responsibility of ECCD in Sri Lanka



According to the informant at the Children's Secretariat, the Ministry of Women and Child Affairs, which is one of the responsible parties, has given power and the responsibility to the Children's Secretariat to create a child who is strong in mental and physical aspects. At the same time, the Ministry has given the responsibility of coordinating the ECCD programmes in Sri Lanka to the Children's Secretariat.

The Ministry of Women and Child Affairs, Ministry of Health, Ministry of Education, Ministry of Social Empowerment and Welfare and Plantation and Human Development Trust are responsible for the ECCD programs in Sri Lanka. Furthermore, the Provincial Councils also play a crucial role in these programs. According to the interview conducted with responsible personnel in Children's Secretariat, Ministry of Health, Nutrition and Indigenous Medicine has the responsibility of the pre-natal stage and the post-natal of the children. They pay attention to health and nutrition. The Children's Secretariat and the Ministry of Health, Nutrition and Indigenous Medicine are involved in providing early stimulation and care to children. The branches such as the Family Health Bureau of the Ministry of Health, are the centres which facilitate this objective.

Even though it is mentioned as the Ministry of Health in National Policy on Early Childhood Care and Development 2017, the original name of the above Ministry is Ministry of Health, Nutrition and Indigenous Medicine. The issue arises as to why the Policy document has changed the original name of the Ministry. It could be assumed that the Ministry component of Indigenous Medicine has no responsibility for the ECCD programmes in Sri Lanka and hence they did an alteration in the name of this Ministry. The Ministry of Social Empowerment, Welfare and Kandyan Heritage has the responsibility of handling the children with disabilities.

According to an informant in the Children's Secretariat, OUSL conducts teacher training programmes related to ECCD. Furthermore, it has a Day Care Centre and a Resource Centre related to ECCD. Hence, it is evident that this institute holds a certain responsibility in ECCD in Sri Lanka. Furthermore, private partners such as Hemas and People's Leasing Cooperation together with the Children's Secretariat conduct CSR projects on building preschools and developing preschool infrastructure respectively.

NGOs which took the leadership role in ECCD during the early decades are presently dealing with the Children's Secretariat in maintaining the ECCD programmes in Sri Lanka. NGOs such as Plan Sri Lanka, Unicef, World Vision, Save the Children and Child Fund are responsible in the above-mentioned activities.

Figure 1 and the descriptions above elucidate that there are complications in deciding the ministries responsible in ECCD and their responsibilities. With the changes in the governments and the changes in the ministries, it is oblivious whether the duties related to each ministry is subjugated to change or whether they are handed over to more new ministries. If the governments do not pay attention to these ministries and their ECCD related duties, the ECCD of the country would deteriorate. When considering the policies related to ECCD, it is essential that ECCD policies should be immune to the radical shifts in politics in the county.

Conclusion

In conclusion, the shift in the responsibilities and ownership

regarding ECCD is as follows. Initially, ECCD was a responsibility of the NGOs even though the Children's Secretariat was established in the 1970s. Then, both the State and I/NGOs handled the responsibility. Later, the government decided to divide ECCD and preschools into two categories and the first category was the responsibility of the Children's Secretariat meanwhile the responsibility of the latter is unknown. Later, the Provincial Councils were encouraged to maintain the preschools. At present, the Provincial Councils have more power and the responsibility regarding preschools with the 13th amendment to the Constitution. Yet, it is evident that ECCD's overall responsibility is now diverged and different facets of early childhood and education are handled by different institutions. For instance, childhood health is the responsibility of the Ministry of Health. Furthermore, the involvement of different other institutions and NGOs also could be seen. (i.e. NIE, OUSL).

It was evident through the findings that the ownership and the responsibility of the ECCD is unstable. The authorities and institutions that have the ownership and the responsibility of the ECCD often changed. Hence, it can be concluded that there is no specific government or private institute which can be named as responsible regarding the ownership of ECCD.

The ECCD in Sri Lanka is in a stage where no authority considers it to be a crucial aspect in society. Henceforth, at least a responsible institution should be established for ECCD in Sri Lanka. The attention of the Sri Lankan government is crucial for the development and maintenance of ECCD and education.

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