NCAS

Sri Lanka Journal of Advanced Research Studies

IN HUMANITIES AND SOCIAL SCIENCES

Foreword

It is with great pleasure that I present the Vol. 11. No. I of the Sri Lanka Journal of Advanced Research Studies in Humanities and Social Sciences (SLJARS) to the academic community of Sri Lanka and worldwide, dedicated to the wider studies of Humanities and Social Sciences. In an era marked by rapid technological advancements and unprecedented global challenges, the insights and perspectives offered by the humanities and social sciences are more crucial than ever. People everywhere learnt the importance of focusing on human life and nature from a different point of view as a result of the COVID-19 pandemic. The outcome was to put more focus on the studies of Humanities and Social Sciences mostly allowing exploring the complexities of human existence, societal structures, cultural dynamics, and the myriad ways in which we interact with our world.

The National Center for Advanced Studies in Humanities and Social Sciences (NCAS) being the only Research Institute of Sri Lanka governed by the Universities Act No. 16 of 1978, is happy to thrive and embark novel studies in Humanities and Social Sciences under its broader objectives to enhance the capacities and the equilibrium of such studies. Thus, the Annual Research Journal of the NCAS aims to be a beacon for scholars, researchers, and practitioners who delve into these profound and diverse areas of inquiry. Established in 2005, the NCAS commenced its first Journal in 2007, and continues to publish every year in two (02) Parts, with the blind review by the local and overseas subject experts. We are happy to announce that the Sri Lanka Journal of Advanced Studies in Humanities and Social Sciences has been recognized by the 'Sri Lanka Journals Online' since 2007.

It is important to note that each article of the journal represents a significant contribution to our understanding of the human condition, showcasing rigorous research, having unique and innovative methodologies with critical analyses. While some are so significant on exploring historical pathways, and cultural phenomena, some are pillars of examining contemporary social issues and policy impacts. However, the depth and the breadth of topics covered here showcase the richness and diversity inherent in the humanities and social sciences.

A special note is endorsed with regard to the Vol. 11. No. I & II which was expected to be published in 2021. Due to the COVID-19 pandemic, the routine work and tasks were collapsed, and many of us joined on virtual platforms and accepted the virtual reality at its zenith. The research collaborations and field research are not exempted in the particular setting. The NCAS continued its tasks and performances at its best and obtained the research articles remotely from the scholars and researchers. However, the process was not that efficient due to certain other hindrances i.e. the Wi-Fi facilities and the economic crisis, yet we are happy to announce that now in 2023, we are ready to publish the Vol. 11, No. I & II after having a thorough

review process. SLJARS is peer reviwed and follows double blind review process.

I extend my deepest gratitude to the authors, reviewers, and editorial team whose dedication and hard work have made this edition possible. Their commitment to scholarly excellence ensures that this journal continues to be a vital platform for intellectual exchange and discovery. I am confident that the insights and findings presented in these pages will inspire and inform future research, contributing to the ongoing dialogue that shapes our understanding of the world.

Professor (Mrs.) Prashanthi Narangoda
Director/NCAS

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* Sri Lanka Journal of Advanced Research Studies in Humanities and Social Sciences is a continuation of **the Sri Lanka Journal of Advanced Social Studies** published since 2011, which is registered under Sri Lanka Journals online (https://sljass.sljol.info/)

Contents

Analysis on Money Laundering; "National Security Saboteur"

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Abstract

Money laundering is an unscrupulous, cross-border crime, often with multiple perpetrators. The crime is not restricted to the street, making white-collar criminals guilty. Laundering money is a multi-tiered process, due to this complexity, ascertaining who is liable for which crime is a strenuous task. Money Laundering is detrimental to national security. In light of that, the research will deal with whether Sri Lanka's present legal regime is adequate to combat and mitigate money laundering and inquire whether current anti-money laundering laws can ensure the national security of Sri Lanka. Research is secondary research, where existing sources are perused and analyzed strategically. Research has attempted to prove that money laundering is a saboteur of national security. Consequently, research has provided recommendations.

Keywords- *Legal Regime*, *Money Laundering, national Security, Sri Lanka*

Introduction

Financial Action Task Force (FATF) defines the term Money Laundering as "the processing of criminal proceeds to disguise their illegal origin to legitimize the ill-gotten gains of crime." The money Laundering process has three stages. Namely, Placement, Layering and finally, Integration. In the stage of money, laundering, ill-gotten money is placed in the legitimate financial system. In the process of layering, the placed money is broken into several transactions. The complexity results in difficulty to ascertain the money trail and its perpetrators. As a result, ascertaining the owner becomes an arduous task. The final stage is "integration'"; here the ill-gotten money is laundered and mixed with the legitimate money. In past, money laundering was often discussed as generated by drugs. However, presently the predicate offences are wide-ranging. Such predicate offences include tax evasion, bribery, fraud, human smuggling and weapon trade.

Methodology

The research is to recognize money laundering as a saboteur to national security. Therefore, to analyze and gather details research has

utilized doctrinal research methodology, where existing sources are analyzed. By doing that, research has arrived at findings, aftermath recommendations are provided. In legal academia, Doctrinal (or black letter") methodology refers to a way of conducting research that is usually thought of as "typical legal research". A doctrinal research approach will focus on case law, statutes and other legal sources. It differs from other methodologies in that it looks at the law within itself; a purely doctrinal approach does not attempt to look at the effect of the law or how it is applied but instead examines law as a written body of principles that can be discerned and analyzed using only legal sources. "In this research, findings will showcase the strengths and weaknesses in the Prevention of Money Laundering Act and case studies in Sri Lanka, Consequentially, it will prove the need to strengthen anti-money laundering laws to prevent and mitigate national security threats. Finally, the research will provide recommendations.

Results and Discussion
Prevention of Money Laundering Act No 05 of 2006 and amendments (PMLA)

This is the main law that deals with the prevention of money laundering. Section 02 of the Act states that (a) a person who commits an offence under the provisions of this Act whilst being resident in Sri Lanka; (b) an Institution that is used for the commission of an offence under the provisions of this Act, which Institution is carrying on business in Sri Lanka and is either incorporated or registered in Sri Lanka or is either incorporated or registered as a or registered outside Sri Lanka;(c) an Act which constitutes an offence and branch of a bank incorporated er this Act, which is committed in Sri Lanka. This Act applies to natural persons including an individual or a body of persons also financial institutions, which are juridical. Furthermore, Act surpasses the domestic boundaries, which means it is extra-territorial in nature. A similar position is in other countries as well. For instance, In the case *of R V Rogers [2014] EWCA Crim 1680* "Where the conduct occurred outside the UK and there was no allegation of money laundering against the defendant there, Act was sufficiently expansive to confer jurisdiction The court deemed that 'the offence of money laundering is par excellence an offence which, in effect, has no national boundaries".

Section 3 of the Act is on money laundering, provision mentions that (1) Any person, who engages directly or indirectly in any transaction in relation to any property which is derived or realized directly or indirectly,

from any unlawful activity or from the proceeds of any unlawful activity; receives, possesses, conceals, disposes of, or brings into Sri Lanka, transfers out of Sri Lanka, or invests in Sri Lanka, any property which is derived or realized, directly or indirectly, from any unlawful activity or from the proceeds of any unlawful activity, knowing or having reason to believe that such property is derived or realized, directly or indirectly from any unlawful activity or from the proceeds of any unlawful activity, shall be guilty of the offence of money laundering. The Act not only criminalizes the Act. It also criminalizes the mens rea or the guilty mind. In Sri Lanka, the cases of Podi Lassi and Makadure Madush are examples where spouses/ family are arrested for knowing the crime being committed by the offender.

Nonetheless, the offence of conspiracy is not included, which is a deficiency in the present legal regime. Regardless, the law in Proceeds of Crime Act, United Kingdom, and (PCA/UK) defines money laundering as an act, which constitutes an offence under sections327-962 and includes attempt, conspiracy, aiding, abetting, counseling and procuring the commission of the offence, which are called the United Kingdom, principal offences. In addition, there exist non-reporting offences and tipping-off offences under the Act".

Sri Lanka is still restricted it does not include such a spectrum of elements.

Unlike in Sri Lanka, other jurisdictions include conspiracy, also, as an act of committing money laundering. In the case of *US v. Flores, 454 F.3d 149, 155-156 (3d Cir. 2006)* an attorney who was willfully blind to the illegal source of the client's money was convicted of conspiring with the client to commit money laundering by opening bank accounts and conducting financial transactions for the client.

In the case of *R v Joseph Ashman and others (2016)* "The wife and sister of a prolific drug smuggler, who was responsible for importing 4.5 tonnes of cannabis resin into the UK, have been convicted of laundering more than £300,000 proceeds of crime."

One of the strengths of the Act is the ability to apprehend predicate offences as well. In the case of *Director of Public Prosecutions v Elladius Cornelio Tesha and others [2016],* The Courts settled, "It is permissible to charge both money laundering and its predicate offending". The position is the same in Sri Lanka. However, this also has a detrimental effect, the reason is, that the offender may be convicted of the predicate offence rather than money laundering which is hard and seldom established.

As stipulated in PMLA section 3 of Sri Lanka, The penalty for laundering money is, a fine not less than the value of the property in respect

of which the offence is committed and not more than three times the value of the property in respect of which the offence is committed or to rigorous imprisonment for a period of not less than five years and not exceeding twenty years, or to both such fine and imprisonment. *The State v Arthur Chikukwa [2016]* court decided that "there was no duplication of punishment in charging an accused with both fraud and money laundering arising out of the fraud, the accused was guilty of both fraud and money laundering".

It is not only the money generated from deceitful means but also property acquired from money laundering, that can be confiscated. For any proceedings under this Act, it shall be deemed until the contrary is proved, that any movable or immovable property acquired by a person has been derived or realized directly or indirectly from any unlawful activity, or are the proceeds of any unlawful activity, if such property—(a) being money, cannot be or could not have been—(I) part of the known income or receipts of such person; or (ii) money to which his known income or receipts has or had been converted. The presumption of the Act is any Property derived from Unlawful activity (b) being property other than money, cannot be or could not have been (I) property acquired with any part of his known income or receipts; and (ii) property which is or was part of his known income or receipts; and (iii) property to which is any part of his known income or receipts has or had been converted Property derived from unlawful activity any "property", currency or asset of any kind whether movable, immovable, tangible or intangible, whether situated in Sri Lanka or elsewhere.

Moreover, the Act includes legal documents or instruments in any form whatsoever including electronic or digital form, evidencing title to or interest in such assets. Acts of money laundering are committed by a body of persons. In the event, every director or other officers of that body shall be guilty of money laundering. Every partner every member of an unincorporated body, such as an association or club. defense committed without his knowledge and that he exercised all due diligence to prevent the commission of the offence. The assets of any person found guilty of the offence of money laundering shall be liable to forfeiture in terms of for the commission of the unlawful activity".This is witnessed in Sri Lanka, especially with underworld goons and drug kingpins, where assets are frozen of the surviving spouse or other family members. Makadure Madush case and Wele Suda's case are such examples.

As per section 7, whenever the Police have reasonable grounds that a person has accrued wealth that cannot be justified by his or her know, a Police Officer not below the rank of Superintendent Police could issue a "freezing order" on his own prohibiting any transactions in relation to such person's bank accounts, property and investments. Order only lasts for 7-days. The said prosecuting officers could make further applications before the High Court and confirm the aforesaid freezing order in terms of section 8 of the Act for an additional period. However, such confirmation could also extend up to 1-year. Amidst such a freezing order operates the Police via Hon. Attorney General should prosecute against the said offenders if there are satisfactory grounds for framing a charge sheet. A similar position is witnessed in other countries as well, one of the interesting stances in the case of *Hajiyeva v National Crime Agency [2020] EWCA Civ 108 (05 February 2020)* is the Unexplained Wealth Order which amounted to and was upheld by the Court of Appeal as money that is laundered.

Section 16 is on Secrecy obligation overridden. - The duty of a banker concerning the secrecy of its customers Act shall have effect notwithstanding any obligation as to secrecy or other restriction upon the disclosure of information imposed by any law, and accordingly, any disclosure of information in compliance with the provisions of the Act shall be deemed not to be a contravention of such obligation or restriction. Know Your Customer (KYC) and suspicious transaction report are important practices that should be utilized by financial institutions. Whereas, there are lapses in implementation in the Sri Lankan context.

a. *Institutional framework for anti money laundering regime in Sri Lanka*
- Attorney General's Department
- Central Bank of Sri Lanka (CBSL)- Department of Banking Supervision, Department of Supervision of Non-Bank Financial Institutions
- Commission to Investigate Allegations of Bribery or   Corruption
- Department of Cooperative Development, within the Ministry of Food Security
- Department of Immigration and Emigration:
- Department of Inland Revenue,
- Insurance Board of Sri Lanka
- Ministry of Foreign Affairs
- Ministry of Finance and Planning Sri Lanka Customs
- Ministry of Justice

- Non-Government Organizations Secretariat
- Office of the Chief of National Intelligence
- Registrar of Companies/Registrar General Department
- Secretary to the Ministry for Defence
- Sri Lanka Police -Criminal Investigation Division, Terrorist Investigation Division, Police Narcotic Bureau, Interpol Bureau. Human Trafficking/People Smuggling Division.

b. *Gaps, Loopholes and Weaknesses*

In addition to the drawbacks mentioned in the afore section, there are many factors that hinder the justice process. There is a visible lack of quality intelligence and due to limited available information criminalizing and finding perpetrators is a strenuous task. Police still use age-old information gathering procedures and there is only restricted obtainable information, if special investigatory mechanisms are furnished there will be many convictions. It is also important to extend confiscation measures to third parties. Presently, confiscation is impossible if the wrongdoer is dead. Furthermore, insufficient resources, trained personnel, lack of competency and technological know-how affect detrimentally. In addition, the lack of adequate and updated research and training hinders the justice and effectiveness of the anti-money laundering regime.

Politicization is another prevalent drawback. The public has lost faith in the justice system when influential figures are capable of meddling in decisions. One of the key drawbacks is nonprofit organizations go unregulated and unsupervised. Due to unsupervised funds and lack of beneficial ownership, ascertaining the owner is grueling. Similarly, the informal value transfer system is a major hardship. Hawala Banking system is such an instance.

c. *Money Laundering and Sri Lankan experience*

Money laundering is not an unexplored concept in Sri Lanka. Various drug kingpins, underworld goons, religious extremists and terrorists are laundering money on a larger scale. Sri Lankan government militarily defeated the Liberation Tigers of Tamil Eelam (LTTE) and irrespective of Sri Lanka's victory; LTTE's international networks remains intact. It is important to mention that, LTTE and its front, cover and sympathetic organizations are still being tried and convicted for money laundering. As reported in (Swiss prosecutor takes Tamil investigation abroad, 2022), "Between 1999 and 2009, they allegedly created a complex fundraising

structure that involved coaxing members of the Tamil diaspora to obtain loans from banks. To raise higher amounts, the WTCC was accused of creating fictitious companies in the name of borrowers that issued fake salary certificates. "This showcases the prevailing national security menace to Sri Lanka, where terrorism can occur at any time.

Furthermore, Easter Sunday Attack 2019 was funded by laundered money. According to, (Subramanian, 2020) "Zaharan was both a beneficiary and an agent of a well-studied trend that has, for a couple of decades, been shaping Sri Lankan Islam. From Saudi Arabia, rich patrons send money and clerics to build new mosques and seed Wahhabism (Subramanian,2020) goes on to mention that, "Zaharan had possibly received an education in terrorism in India; that he had set up safe houses in Sri Lanka to train his men; that the money for at least one such house came from Inshaf. This house, near Wanathavilluwa, was disguised as a poultry farm. "There was a lagoon on one side," the intelligence official said. "A direct run from South India. All these explosives and chemicals could have come through that sea route." The property and assets brought by dirty money are a fine portrayal of property accumulated by gains, which have a dirty source.

d. Money Laundering and National Security

Unlike in past, national security is not restricted to militaristic aspects. Money laundering is destructive to all security facets, including, political, economic and social as well as human security. Ascertaining perpetrators as well as following the money trail is an uphill task because crime is extra-territorial in nature.

Challenges and threats to national security occur by various means. Sri Lanka's strategic location makes Sri Lanka more vulnerable since there is a greater tendency to commit predicate offences, such as illegal firearm trade, human smuggling and narcotics trade. Furthermore, virtual currency, bank complexity, Front Companies & Front Loans, False Import/Export Invoices, Privileged relationships and Politicization. When perusing all this, it is evident that money laundering is a saboteur to the security of Sri Lanka.

Conclusion and Recommendations

It is crystalline that money laundering is detrimental to all security spheres which has been locomoted from militaristic aspects to nontraditional security threats. Sri Lanka has a satisfactory legal regime to combat and minimize money laundering. Yet, there is room for development

to dissuade and thwart national security threats. In light of that, several recommendations can be made.

Sri Lanka must align its anti-money laundering framework with international standards. Thus, Act must be progressive since money laundering is an offence that is constantly altering. Adding burden, with technological competence and virtual currency, the money trail cannot be hunted. To eliminate and mitigate these barriers it is pivotal to have an interagency platform consisting of relevant ministries, security forces as well as private entities as deemed fit. In addition, there should be mutual legal assistance with other countries, to share expertise and experience. Information exchange will be a prudent choice to prevent and mitigate money laundering. Another imperative step is to create public awareness of money laundering and its repercussions of it. By doing that, public will refrain from committing money laundering. Government must allocate resources sufficiently and invest in research and development in addition, to conducting, training programs for officers. Moreover, it is noteworthy to regulate and supervise nonprofit organizations to verify beneficial ownership. Introducing legislation for asset recovery is imperative; finally, Designated Non-Financial Businesses and Professions should be taken under the purview of the anti-money laundering framework.

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Applicability of the flipped classroom approach to teach English during post-pandemic Sri Lanka
(Case Study based on Sabaragamuwa University of Sri Lanka)

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Abstract

Flipped classroom model, a blended learning method, puts an end to the conventional lecturing method and creates an active learner-centered pedagogy. The main objective of this study was to investigate the applicability of the flipped classroom model by examining the perspectives of the undergraduates and discovering the advantages of flipping the post pandemic tertiary level English as a Second Language (ESL) classrooms in Sri Lanka. The sample of the study consists of sixty freshman undergraduates of the Sabaragamuwa University of Sri Lanka. A questionnaire survey served as the primary tool in collecting data. Follow-up interviews were conducted to attain further clarifications. The data were analyzed both quantitatively and qualitatively. The findings of the study revealed that, the students do have a positive perception regarding the application of the method into English language instruction. As for the advantages of the method, the data manifested the factors such as making the students well- prepared prior to the class, familiarizing them with technology based education and traditional classroom method, making them engaged in the group activities, a remedy for absenteeism, a way to enhance learner autonomy and making a more interesting and convenient learning environment. The findings suggested that familiarizing both teacher and students with technology, conducting training progarammes and changing the mindset of the teacher towards a learner-centered pedagogy will enhance the quality of the flipped classrooms.

Key words: English as a Second Language, Flipped classroom model, Learner-centeredness, Post pandemic education, Tertiary level

Introduction

Formal education system in Sri Lanka is dominantly based on the traditional teacher centered face-to-face classroom mode until the pandemic forced the system to a halt. With COVID 19 outbreak in 2019, the regular classroom setting, where the lecturing is primarily practiced by the teacher in order to explain concepts, was no longer used. Thus, from 2020, accessible online platforms such as Zoom, Learning Management System (LMS), Virtual Learning Environment (VLE), Google Classroom and Microsoft Teams were used to teach students in all primary, secondary and tertiary levels of education. Having engaged on virtual learning environments for more than two years, the students are becoming competent to behave in both traditional face-to-face classrooms as well as in virtual classrooms. As a novel step, introducing the students in tertiary level of education to the flipped classroom model that is a branch of the blended learning approach will have a positive effect on language education in the Sri Lankan university system.

As Shimamato (2012) mentions, traditional teacher centered classroom system is a cause of producing passive learners who are not competent in working independently. In contrast, Egbert, Herman and Lee (2015) state that by implementing flipped classroom which enhances working collaboratively with the peers under the assistance of the teacher by using the course materials, which they have already gone through, a resource rich student-centered learning environment can be created.

According to Berrette (2012), implementing flipped model is advantageous as it makes the classroom learning more inquiry-based and experiential. The students attend the class pre-prepared as they have received adequate exposure to the learning materials prior to the in- class session via the inputs shared in a flipped classroom milieu. They are allowed to explore more knowledge regarding the content and interact with other students while doing in-class collaborative activities. Such activities enhance the opportunities to meet learning needs instead of producing passive learners.

Although this novel approach has been immensely studied in the global context, still there are some gaps to be filled. Moreover, as far as the local context is concerned, this concept is not adequately studied and such gaps will be further discussed. On the other hand, with a discussion on how to incorporate flipped model into the Sri Lankan classroom context followed

by a review of the existing literature the study is extended to explore the perspectives of the students on the applicability of the flipped model.

Bergmann and Sams (2012) express in their book, *Flip Your Classroom, Reach Every Student in Every Class Every Day,* that the concept of a flipped class can be defined as what is traditionally done in- class is done at home, and that what is traditionally done as homework, completed in- class. As this statement suggests, the very term "flipping" depicts that this method is controversial since it has changed the fundamental concepts of language teaching methods and approaches.

Research Problem and Research Objectives

In this research, an attempt is made to unearth the advantages of flipping the ESL classrooms as it is of great significance in understanding the validity and reliability of implementing the flipped model. It serves as the first specific objective of this study. Thus, in order to further the objective of the study, the researcher has devised the following research questions based on the research problem:

- What are the ESL teachers' perspectives towards the flipped model?
- What are the advantages of flipping the ESL classrooms?

This study is primarily based on investigating the applicability of flipped method to teach English language to the ESL learners at tertiary level. Thus, a sample of students who are learning in the Faculty of Social Sciences and Languages of the Sabaragamuwa University of Sri Lanka was selected.

The Faculty of Social Sciences and Languages of the Sabaragamuwa University of Sri Lanka has enhanced the quality of the lecture halls by furbishing the classrooms installing interactive boards, free Wi-Fi facilities and smart classrooms. Further, there is a language lab with 25 computers exclusively for the ESL learners. As well, the students are given an activity room with other necessary equipment to be utilized at their free time. In addition, the upgraded classroom environment will effectively support the group activities as they play a huge role in the flipped classroom model. Thus, in terms of physical facilities, there will not be any issues to implement the flipped model since all the steps are already taken in advance to resolve the anticipated problems. Such amenities of physical nature enforce the faculty to embark on their optimal utilization to deliver maximum to the learners.

In the pilot study, it was observed that the learners have already studied under both traditional face-to-face classroom teaching method and virtual language teaching platforms such as VLE, LMS, Moodle, Zoom, Microsoft Teams, Google Classrooms and many more to learn ESL. Thus, all the students in the Department of English Language Teaching of the Faculty of Social Sciences and Languages in the Sabaragamuwa University of Sri Lanka are familiar with the technology integrated language learning. Therefore, in this study, the researcher hypothesizes that the flipped classroom model is applicable to learn ESL by the undergraduates as a post pandemic learning approach.

Literature Review
Flipped classroom model

The flipped model was first introduced by Bergmann and Sams in 2007. They are chemistry teachers in a high school in Colorado, USA. They recorded their lessons for the students who got absent since those students can watch the video later and review the things they have missed from the outside of the classroom. They were able to get effective results by implementing this method. Thus, they expanded it by making online videos.

In their book, *Flip Your Classroom: Reach Every Student in Every Class Every Day*, Bergmann and Sams (2012) mention that, they have recorded their lessons out of selfishness. They were spending inordinate amounts of time re-teaching lessons to students who missed class, and the recorded lectures became their first line of defense. Most importantly, the absent students of the class loved the recorded lectures. The students who missed class were able to learn what they had missed. Some students who were in class and heard the live lecture began to re-watch the videos wherein some others watched them when reviewing for exams. The authors mentioned that, they loved it because they did not have to spend hours after school, at lunch, or during their planning time getting kids caught up.

As Egbert, Herman and Lee (2015) state, in the flipped model, there are no set guidelines. Thus, the teachers are emancipated to tailor the lessons and the modes of delivery as it is more convenient, effective and efficient. Baker (2000) mentions that in the flipped model, by using technology, the teacher can enhance the interaction between the teacher and the students as well as among the students by strategically changing the dynamics in presentation of information. He further elaborates that, by making the recordings of the direct instruction lectures accessible prior to

the class, the students are given an opportunity to learn the contents at their own phase and space. This strategy will make more time for in-class activities such as group work, lab experiments as well as discussions.

Post pandemic education system of Sri Lanka

Sri Lankan education system was primarily based on traditional face-to-face classroom method until COVID- 19 outbreak in 2020. With this pandemic situation, all the functions of each and every system changed and consequently the education system also abruptly changed. Thus, it can be identified as a turning point of the education system of Sri Lanka since online method was implemented in teaching.

In the tertiary level of education also, moving forward with online education by breaking down the traditional pedagogical practices can be identified as revolutionary. Thus, in the post pandemic Sri Lankan classroom setting, the students who are greatly updated as well as upgraded with the online systems will find it interesting to study in a more blended setting where they meet a proper amalgamation of both face-to-face and online systems. Thus, incorporating the flipped classroom model which is not only a current trend, but also an innovative teaching method, can be acknowledged as a possible solution to develop the education of the students in the tertiary level.

Teacher's role

Bergmann and Sams (2012) study their classrooms to find how the class time and teacher role change in the flipped classroom in comparison to the traditional classroom (Table 1).

Traditional Classroom		Flipped Classroom	
Activity	Time	Activity	Time
Warm-up activity	5 min.	Warm-up activity	5 min.
Go over previous night's homework	20 min.	Q&A time on video	10 min.
Lecture new content	30-45 min.	Guided and independent practice and/or lab activity	75 min.
Guided and independent practice and/or lab activity	20-35 min.		

Table 1: Comparison between traditional classroom and flipped classroom (Adapted from Bergmann and Sams -2012 (pg. 15))

As table 1 indicates, there is a huge difference between traditional classrooms and flipped classrooms in terms of allocated time duration. In the traditional classroom settings, the teacher spends 5 minutes for the warm- up activity and about 20 minutes to discuss the homework done by the students. Most of the time will be spent on delivering the lecture in which the teacher will be presenting the contents.

In contrast, in the flipped classrooms, the whole process is turned over. Out of the 90 minutes of the class time, 5 minutes will be allocated for the warm up activity. Since the students have attended the class, being prepared for the lesson by watching the videos at home, 10 minutes will be allocated for the question and answer session on the video. Finally, rest of the time i.e. 75 minutes, will be allocated for guided and independent practice and/or lab activity. This final step expresses the importance of implementing flipped method highlighting its value in practical sessions.

Thus, as table 1 depicts that the class is centered on the student, not the teacher. Most of the L2 classrooms have become more teacher-centered although the teachers attempt to make them learner-centered. This has become one of the greatest problems in the ESL pedagogical context. Thus, as the above table illustrates, this problem can be easily resolved by applying the flipped model to teach ESL

When reading the existing literature, it is understandable that there is an abundance of studies conducted in the global context in terms of implementation of flipped classroom method with its importance and challenges. Further, the literature confirms that in the Asian education context also many researches have been conducted on the flipped classroom method and it is evident that this model is a well applicable method in any pedagogical context. In contrast, there is a scarcity of studies and evidences to prove that the flipped model is applicable to the Sri Lankan education context, specifically, language pedagogy. Moreover, even though there is ample researches, which are executed to study on the implementation of flipped classroom model in the primary and secondary education, it is difficult to find the resources related to the tertiary education particularly in Sri Lanka.

In contrast, there are several researches which are conducted in relation to blended learning under which the flipped classroom model is discussed. Thus, as the literature depicts, there is a dearth of published researches in relation to testing the applicability and implementation of flipped classroom model in tertiary level L2 education in Sri Lanka.

Methodology

This research was executed using a mixed research design since the objectives of the research suggested both quantitative and qualitative data. A sample of sixty (60) undergraduates who are studying English as a Second Language was selected from the Faculty of Social Sciences and Languages of Sabaragamuwa University of Sri Lanka.

A questionnaire survey was mainly conducted as the method of primary data collection whereas semi structured telephonic interview method was used to cross-examine and confirm the answers given by the participants. The data were analyzed both quantitatively and qualitatively using Google forms and thematic analysis.

Results

Data analysis and discussion

a. Students' opinion on the best language learning platform

In this section of the questionnaire, the personal opinions of the participants were tested. The question addresses that, out of the three learning methods: face-to-face, online and mixed method, what the best method is as per the students' perspectives. The results of this question are presented both tabularly (Table 2) and graphically (Figure 1) depicted as follows.

Teaching-learning platforms	Count	Percentage
Face-to-face method	20	33.3%
Online method	04	6.7%
Mixed method	36	60%

Table 2 Students' opinion on the best language learning platform
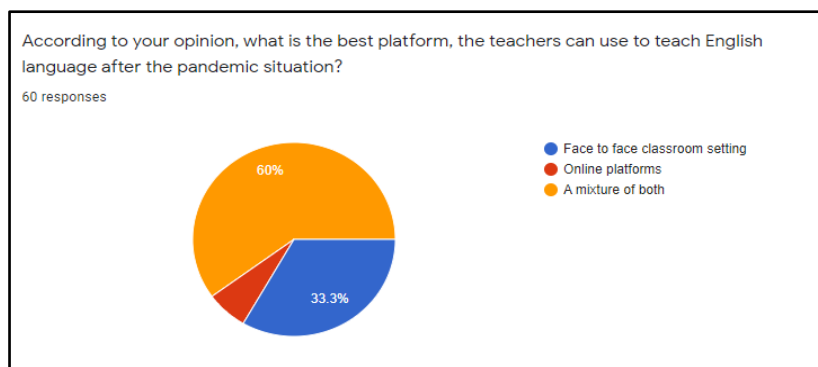
Figure 1 Students' opinion on the best language learning platform

The results show that a majority of 60% of the respondents have stated that they would like to participate in the lectures which are taught in the settings where the mixed method of language teaching is executed. A percentage of 33.3 of the students are willing to attend traditional face-to-face classrooms whereas a minority of 6.7% of the students is willing to attend online classes depending on various personal reasons.

The students state that there are both advantages and disadvantages in all these methods, as per their perception. For example, they state that, even though the online learning method is economically beneficial, there are many disadvantages of the method when the Sri Lankan context is considered. For instance, they elaborate that, having poor internet connection in the most of the areas of the country and not having sophisticated devices to attend lectures which are totally online is a problem for many of the students. On the other hand, they perceive that the face-to-face classrooms are more convenient as far as the technological aspect is considered. Still, they perceive it less economically advantageous since travelling requires a lot of financial support and time. Further, the majority of the respondents highlight that having a mixture of these methods is more beneficial since the students can negotiate and schedule classes at the convenience of both teacher and the learners. At the same time, they elicit that even though there are numerous drawbacks of the method, they are able to manage and solve those issues with the consent of the teacher and the students. Thus, the data present that according to the perspectives of the students, out of all these methods, the most beneficial method is the mixed method. In other words, the students perceive that flipping the college classroom is rather beneficial than totally limiting the classroom to one particular method of teaching.

b. Students' preference for the flipped model

This question of the questionnaire is designed to ascertain the preference of the students for the implementation of the flipped model to teach English as a second language. The responses of the students are tabulary (Table 3) and graphically (Figure 2) depicted below.

Flipped Model	Count	Percentage
Students prefer the model	60	100%
Students do not prefer the model	00	0%

Table 3 Students' preference for the flipped model
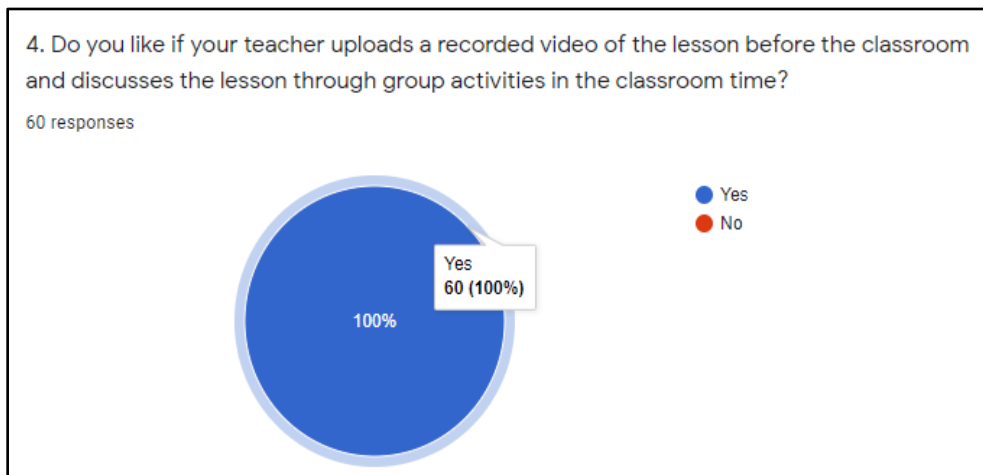
Figure 2 Students' preference for the flipped model

All the participants of the survey positively responded when their preference for the flipped classroom model was inquired. As it is depicted through the question, the concept of the flipped model was explained using carefully selected simple and basic vocabulary; thus, the students can easily comprehend it. In accordance with the research data, all the respondents prefer if their classrooms were flipped. The data represent a percentage of 100 which represents the opinion of the whole sample. Moreover, the interviews have further confirmed that, the undergraduates were interested in the implementation of a mixed method to teach language in the tertiary level education setting. They elaborated that having a mixed method contains the advantages of both methods even though there are a few more disadvantages.

c. Students' perspective on the flipped method

The first research question of this study is to examine the perspective of the undergraduates on the flipped learning method to teach English as a second language. Thus, to attain the results, the question was designed qualitatively with the intention of acquiring a more elaborated answer. The ideas shared by the students during the interviews and in the questionnaires are extracted without editing for any grammatical mistakes committed.

As per the responses given by the students, majority of the respondents depict a positive attitude towards flipped learning method. The

answers of the participants of the interviews and the questionnaire survey contain different adjectives to describe how good this method is. Those adjectives can be summarized and listed as follows. To summarize their answers, they perceive this method as a good, effective, useful, practical, successful, interesting and efficient method. These answers can be elaborated from their own words as follows.

Student 06:

"It can be seen as a practical alternative method. Because it helps to engage in activities during lecture hours. Because we can watch videos before come to class"

Student 07:

"I think that it will be efficient because rather than studying in the same method it would be a new experience to all of us to try out new teaching methods."

Student 09:

"I think this method is practical and it is useful because it helps us to understand our lessons very well. We can refer the lessons before joining to the class and it will help to improve our knowledge of the relevant subject"

In contrast, 10% of the respondents have stated that they have a neutral idea on this method since they see both advantages and disadvantages in this process. The extract below shows how they further justified their answer,

Student 05:

"I actually accept that I don't fully support or oppose this kind of educational system because sometimes I agree this system and sometimes I disagree this process."

Similarly, a minority of 10% of the students believe that they do not perceive this method as a successful method to teach English though they prefer it as a learning method.

Student 03:

"In my opinion, I think this method is more disadvantage than advantage. This is a time saving method but the success of this method is limited.

Further interviews with this particular student confirmed that she can understand the procedure of flipped method. Still, she is of the belief that the flipped method will not be as successful as the other methods that were used to teach English as a second Language until today.

Advantages of implementing the flipped method

This question was designed based on the second research question of this study, "the advantages of flipping the ESL classrooms" according to the perception of the students. The answers given by the participants in the questionnaires were confirmed through the responses of the interviews since those responses were more detailed. Thematic analysis was applied to analyze the qualitative data gathered for this question. The themes emerged are analyzed as follows.

Flipping makes students well- prepared prior to the class

As per the responses of the undergraduates, the most common advantage of implementing this method is the opportunity given for the students to be well prepared before attending the class. Since the students attend the lecture after watching the video recording uploaded by the lecturer, they are well prepared to engage in the activities. The following excerpts manifest the opinions of the students in this regard.

Student 06:

"There will be many advantages by implementing this method because when the students get an idea about the lesson before coming to the lecture physically they know what they are going to learn. So they will do researches and furthers findings about the lesson. They will attend the class happily and comfortably without any burden.

Student 07:

"Students can be pre-prepared for the next lessons with the notes they have to collect"

Student 01:

"We will be well prepared in the classroom and will be able to engage in the activities confidently after referring the online lessons."

Student 05:

"I can search and find information related to the topic before lecture or class hours."

Thus, as these excerpts manifest implementing flipped classroom method will be supportive in enhancing the students' prior knowledge on

the subject and the lesson. Moreover, it makes a learner-friendly atmosphere inside the classroom since the students are well prepared for the lesson. Most of the time, learners find the lessons boring since they are not familiar with the lesson. As per their ideas, if they were given a chance to get ready for the lesson beforehand, they will be able to work confidently in the class. Further, they elaborate that having done some research on the topic prior to the class make them outstanding learners in front of the teacher and the peers. In their responses, they highlight that such a context makes the learning process more interesting and less burdensome.

Flipping makes the students familiar with technology based education and traditional classroom method.

Due to the prevailing pandemic situation in the country, all the students, despite their level of education, are forced to move to the online learning platforms. Thus, the tertiary level students are familiar with both traditional face-to-face classroom method and virtual learning platforms. Therefore, the students have identified that having this experience will create a more successful atmosphere inside the flipped ESL classroom. Hence, they elaborate that implementing this method as a remedy at the post pandemic situation would be more effective. The responses of the students can be extracted as follows.

Student 16:

"As well, I consider, it will be way more convenient for us as we are getting familiar with the online platform as well."

Moreover, they believe that updating the education system as a positive factor. Thus, combining the education with technology will empower students for the future with the updated knowledge. As students further elaborated, familiarizing them with a new learning environment is an advantage.

Student 23:

"I personally believe that this method is really good because it offers new learning environment and new way of looking at things for us."

Thus, the students perceive this method as more advantageous since they can meet their expectations of improving their knowledge and skills regarding technology in this new learning environment. Their explanations portray that they view this as an opportunity to get prepared for the future which is completely technology driven.

Flipping makes students engaged in the group activities

The participants of the study perceived that engaging in group activities is advantageous as the students are able to improve different skills in a flipped language classroom. It is evident in the literature that in regular ESL classrooms where the traditional teacher centered methods are applied to teach language, most of the class time is spent to present and explain the lesson. On the contrary, in the flipped classrooms, the teacher is able to spare most of the class time to make the students engaged in group activities. The following excerpts manifest the perceptions of the undergraduates on the group activities.

Student 02:

"We will be well prepared in the classrooms and we will be able to engage in activities confidently after referring to online lessons. And I believe we will have more time to engage and learn from the activities and I find it will be a more better method to memorizing the daily lessons with practice exercises. Currently I see that there is no enough time for engaging in activities due to the allotted time being short. But in this new method, students can engage in individual and group activities and even have time to discuss their doubts regarding the lessons with their lecturers."

Student 17:

"It will be easier to do the group activities as we can use the knowledge we got from videos."

Student 55:

"Teachers can engage with the students during the group activities easily."

In their responses the students illustrated that the prior knowledge they acquired from the recorded lessons before attending the class can be used effectively when engaging in the group activities. Since they are well prepared for the lesson, they can work confidently and independently during the in-class activities.

They further elaborated their experiences regarding the current education system. As per their ideas, they have never experienced a learning situation where they got the whole class time to do activities. Instead, they have always teacher-centered classrooms where content delivery is prioritized. When these two situations are compared, they explain that flipping the classroom create a great opportunity for them to work in a

learner centered classroom where they are given the freedom to utilize the whole class time to engage in activities.

Moreover, in the above excerpts, it can be clearly seen that the students perceive this method as advantageous since they get an opportunity to get their doubts clarified. As they state, even though they are unable to get teacher's support when watching the videos, they can get further clarifications while engaging in the activities.

Finally, they perceive that engaging in group activities is beneficial since the teacher facilitates the class without directly involving in the activities. They perceive that creating such an atmosphere inside the classroom is more convenient and advantageous.

Flipping is a remedy for absenteeism

Sparing time for doing revisions of the previous lessons on behalf of the absentees is one of the major issues teachers face in the class as it makes managing the allocated time more difficult. In the interviews, the students expressed their ideas regarding this issue stating that, if a student gets absent for a class, it will not be a huge issue since they have access to the lessons at any time.

Student 53:

"If we face an occasion to miss lecture of class hours because of illness or family problem, this method will not be a problem as we already know about the lesson."

Student 15:

"Even I get absent I can still watch the recordings and get knowledge for the activities"

The ubiquitous nature of the flipped method makes the classroom activities more convenient for both teacher and the learners. The students perceive this method as the best option for absenteeism. Further, the students can download the videos the teacher has uploaded in advance. So, they do not need to watch the videos at a stretch. They are able to pause it and watch when they get some free time. Therefore, the flipped classroom method is a great remedy for the absenteeism and other practical issues.

Flipping enhances learner autonomy

In contrast to the traditional teacher-centered methods, in the learner-centered methods, enhancing learner autonomy is a major focus. Thus, as the students implied in their answers, they will be able to learn

English independently and confidently if this kind of a method is applied to the teaching of English as a second language.

Student 60:

> *"As we will be able to get an idea about the lesson in advance we can easily prepare for the lecture confidently"*

Student 38:

> *"As for the language like English, I believe this method is really practical because it requires certain categories to be improved like speaking skills. Currently, most of my friends aren't active in classroom which held via online platform though. Through this new method, each and everyone have to participate in and improve their skills. So I believe this method will be more convenient and good for the students."*

The students state that implementing this method is beneficial as they have acquired knowledge in advance. As per their perceptions, it results in enhancing learner autonomy since they are able to actively engage in the in-class activities. Further, they explain that flipping is a practically great method as it promotes engaging in group activities. On their point of view, it results in improving speaking skills and interpersonal communication skills of the learners.

The students compared their current experiences on online learning platforms with the opportunities created in the flipped method. They explain that in the online lectures, the students are mostly silent as they are not confident enough to articulate their thoughts in front of the classroom. Thus, they perceive that, the flipped model provides a good platform for those passive learners to speak up their ideas.

Flipping creates an interesting and convenient learning environment

As the participants of this study perceive, flipped learning environments are convenient in many ways since students can refer to the recording anytime when they are free. As well, they can rewind the recordings and watch several times until they understand the most complicated parts. As well, they can make notes on their own since the teaching can be adjusted to their pace of learning.

Student 12:

> *"We can solve our doubts with the lecturer. And the lecturer can conduct the class without making it boring. So I think it is a good method to move from traditional teaching method."*

Student 08:

"It will be convenient to keep the track on completing our notes. It is a very challenging task for us these days in online lectures. When doing activities we can ask and clear our doubts. So I believe this method will be way more convenient and practical to teach English."

Student 37:

"In this method we can refer to the lessons anytime when we are free."
"We can watch videos later if we have any problem"

Student 55:

"We can learn on available time if we are busy during class hours."

Student 28:

"We will be able to rewind and get the clarification how many ever times needed, because we won't be feeling shy to ask repeat the explanation."

Student 34:

"Time saving since it implies only the required lessons and no extra chatting"

The students express their ideas on the learning environment flipping creates by stating that the innovative nature of the method makes the classroom more convenient and enjoyable. It breaks the monotony of the class which they experience to a greater extent in the online lectures. During both online and traditional lectures, the teachers sometimes have some chitchat with the students as a strategy to get rid of boredom. Some students find this inconvenient as per the differences of their personalities and they state that they find this method more comfortable since the maximum time is used for the content delivery without having extra chatting.

Repeating the videos several times has been also perceived as an advantage of the method since it gives shy students a chance to get further clarifications without getting the attention of the colleagues. They mention that watching videos at their own pace makes learning more convenient since the students can identify their speed and adjust their learning accordingly.

Recommendations and suggestions

In terms of achieving the expected outcomes by successfully implementing the flipped classroom model, some changes should be made in the existing education system. The research findings suggest that it is a requirement to provide adequate knowledge for both educators and educatees in terms of enhancing the effectiveness of the flipped classroom

method. So that, the teachers will be able to record the high quality videos which are free of technical errors. On the contrary, the students will be able to access, download and make use of those videos without having any kind of technical issue.

At the same time, the findings imply that, administering proper training programmes for the teachers with reference to recording proper videos is also a necessity when implementing the flipped classroom model because, if the voice and visuals of the teacher are not clear, it will be difficult to ensure that the students are watching the videos regularly.

Most importantly, it can be suggested that the mindset of the teachers regarding the teaching- learning process should also be changed. Even though all the other aspects are changed, if the attitudinal change is not occurred, the expected consequences will not be achieved. In the traditional teacher-centered classrooms, where the jug-mug process is applied, the teachers tend to take control over the class. In contrast, in the flipped classes, the teachers need to give control of the learning to the students. This can be a difficult move for most of the teachers. Still, it can create an environment where real learning occurs since the students take the responsibility of their learning.

Limitations of the study

This study was conducted during the COVID- 19 pandemic period as a small- scale study involving a single institution, Sabaragamuwa University of Sri Lanka. Thus, there were several constraints encountered in the process of progression of the study.

The most evident constraint of this research was that of the size of the sample which is considerably small. Due to geographical limitations, the researcher was unable to choose a sample from all 15 state universities in Sri Lanka. Thus, the selection of a small sample was an unavoidable limitation of the study that prevented a clear generalized statement about the applicability of the flipped model to the entire university system.

Further, the findings of the research were limited by the inherent limitations of the instruments. Due to the prevailing situation of the country, it was difficult to conduct face-to-face interviews with the participants.

Even though the area of flipped method can be identified as a thoroughly studied area in the global context of education, however, in Sri Lankan pedagogical context, it appears as there are a little resources to find

published researches. Hence, it creates a huge difficulty in citing and referencing the prior studies in the local context.

Conclusion

The primary focus of the present study was to examine the applicability of the flipped instruction model in the tertiary level education in post pandemic Sri Lanka. It also aimed at investigating the perspectives of the students towards the method and the advantages of flipping the classroom. Multiple instruments such as questionnaires and telephonic interviews were used to collect data.

The most useful finding from the study was that the undergraduates perceive this method as an effective and advantageous method which can be successfully implemented in the tertiary level education system.

Results of this investigation of introducing a completely new approach for second language teaching, pointed to pedagogical implications for the field of English language teaching. It was suggested that the attitudinal change of the teachers and students should be occurred while empowering them with technical knowledge needed.

It was suggested that further research should be executed to look at the suitability, effectiveness, challenges and the impact of learner differences on implementing flipped instructions in the post-pandemic tertiary level education.

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Impact of Contextual Determinants Towards the Disposition Bias of Individual Investors in the Sri Lankan Stock Market

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Abstract

The study of individual investors is complex in behavioral finance. Individual investors decision-making making associated with psychological cognitive drivers which involve disposition bias disqualified from rational investment decisions. The previous studies recognized disposition bias was limited in addressing cause and effect. The findings are important for individual stock investors and potential investors significantly; can be attentive to their own cognitive and emotional factors in their accurate investment decisions. A survey model was conducted among the 306 individual investors on Colombo Stock Exchange (CSE). The events, beliefs, behavioral consequences, loss aversion, disposition and investor sentiment were measured through standard questionnaires of previous scholarly articles. The data were analyzed using structural equation modelling (SEM) with AMOS software. The empirical data supported that loss aversion and investor sentiment positively impacted the disposition bias of individual investors. The events, beliefs and behavioral consequences (emotion) do not considerably drive factors of disposition bias in the Sri Lankan stock market. The findings revealed that loss aversion and sentiment is the key driver of the disposition bias existence which is confirmed by the findings of the previous scholar. Moreover, the study confirmed the mediation impact of events, and loss aversion through disposition bias. The main theoretical contribution of the paper is; the ABC model does not fully support in Sri Lanka context to address the disposition where the loss aversion contributes to the execution of the disposition and moderating by investor sentiment. The present findings will be useful for the investors, potential investors and the stockbroker firms for maintaining and leading the substantial confident decision making reducing of having biased decisions in the Sri Lankan context. The study recognized the biases of individual personality with nature in the initial structure before leading to disposition bias. The data collection period was limited to the second half of the year 2020 and the

generalization is restricted for the Sri Lankan market. The macroeconomic implications and the institutional investors do not consider in the study due to complexity. The study confirmed the relationship and impact of loss aversion towards disposition bias. The paper recommended that the investors with risk-averse (loss averse) lead for the disposition. The disposition is considerably dependent on the loss-averse attitude of the individual personality and moderated by investor sentiment.

Keywords: *Disposition Bias, Loss Aversion, Colombo Stock Exchange, Individual Investors*

Introduction

Investors' tendency to hold losing investments too long and sell winning investments too soon is recognized as disposition bias in technical language. Traditional finance theories are built on the key assumption that investors are rational beings, which aligns with the Efficient Market Hypothesis (EMH). Behavioural Finance uses insights from investor psychology to explain the irrational behavior and biases of individual investors. Behavioural Finance is a finance field that explains stock market anomalies using identified psychological biases (Fama, 1998). Behavioural finance recognizes various types of biases, including overconfidence, herding, loss aversion, disposition and self-attribution. Thus, disposition bias positively and negatively influences investors' decision-making on the Colombo Stock Exchange (CSE), and this has been empirically proved by researchers (Siraji & Buvanendra, 2019). Investors on the CSE may place too much faith in their forecasts, leading to bias in their actions (Pathirawasam & Edirisinghe, 2011). Therefore, it is worthwhile to study and understand individual investors' behaviour on the CSE and the determinants influencing their decisions.

The Colombo Stock Exchange (CSE) has 289 listed companies representing 20 industrial groups as of 30th June 2020. In the year 2018, the CSE made a strong start with investors entering capital markets with an optimistic outlook. However, the situation had reversed by Feb 2018, starting with a stock market correction worldwide. Despite an unprecedented business landscape, the CSE had to reduce market capitalization to 2% in 2018. An active primary market mainly drove this trend with thirteen new issuances (equity and debt securities). Investors' active participation is necessary for stock market development since it impacts the country's economic growth. The Sri Lankan stock market

contributes largely to the Sri Lankan economy and attracts foreign investments. Therefore, studying investors on the Colombo Stock Exchange is essential in the current context to attract investors for expansion.

Traditional finance seeks to understand financial markets using models in which agents are understood to be "rational". Rationality comes in two ways. The first argument explains how investors receive information and agents update their (investors') beliefs correctly. The second argument contends that investors provide their opinions and that agents, using these opinions, make normative and acceptable choices. Traditional financial theories explain the rational decision-making of rational investors. The Bounded Rationality Theory, however, suggests that investors' decision-making is not fully rational but is 'bounded by rationality. It explains that individuals are keen to make satisficing decisions rather than optimizing decisions. In the real world, rational decision-making is not applicable. Simon suggests that economic agents use heuristics to make decisions rather than applying a strict, rigid rule of optimization because of the complexity of many situations (Simon, 1955).

In the light of Simon's evaluation, psychologists became more concerned with incorrect (irrational) human interpretations of chances. The preliminary study in this direction was argued by Kahneman & Tversky (1979) in prospect theory, which explained how bounded rationality works in human beings. The prospect theory pointed out that assessing an alternative's outcome comes from individual personal judgment based on mental shortcuts, namely, heuristics, that govern human beings' rationality concerning decision making (Tversky & Kahneman, 1973, 1974). The prospect theory describes that people decide between alternatives that involve risk and return (Tversky & Kahneman, 1973, 1974).

Further, there is an alternative model of decision making under risk and uncertainty. The advantage of the theory is that it explains loss aversion, overreaction and behavioral biases. Loss aversion is a situation in which people generally opt to take a chance rather than bear guaranteed losses in an investment option (Shefrin, 2000). The rational and irrational behavior of the cognitive psychological perspective that does not explain cause and effects lead to disposition bias. The modern finance theoretical perspectives are described by (Miller,1999), while the behavioural finance historical development is well explained by (Ritter, 2003), (Baker & Nofsinger, 2010), (Statman, 2014) and (Thaler, 2016). From a psychological perspective,

irrationality in human decision-making is fundamental to human nature (Ellis, 1976).

According to behavioral finance models, every individual has unavoidable psychological biases that prevent them from making rational decisions and these have adverse effects on investment decisions and market efficiency. (Bakar & Yi, 2016) found that psychological factors have a significant impact on the decision making of individual investors in stock markets. According to (Baker & Nofsinger, 2010), "cognitive errors", "fundamental heuristics" and "psychological biases" affect the investment decision-making process. Mental biases are alluded to as convictions and inclinations (Pompain, 2006). Investment decision making and market efficiency are complex concepts that scholars are still discussing. There is a positive connection between the economy and the securities exchange; the stock exchange's deterioration will adversely affect the economy and vice versa. Thus, individual investors' decisions on the securities exchange have a critical part to play in deciding market development, which manages the economy (Kengatharan & Kengatharan, 2014). However, scholars have found that an individual's psychological make-up strictly correlates with their investment decisions on the Stock Market (Ajmal et al., 2011), (Baker & Nofsinger, 2002), (Shefrin, 2006).

The current research study focuses mainly on disposition bias, a mental heuristic in behavioral finance. Traditional finance discusses and elaborates on rationality, though the concept is outdated compared to the concept of irrationality which scholars in the 1970's examined. The ABC's of rational-emotive therapy (RET) and of cognitive-behavioural therapy (CBT), explained what complex cognition, emotions, and behavior are and how they inevitably include and interact with each other. (Ellis, 1991).

The ABC Model of causation provides an underlying model to understand the cause and effect of behavioral anomalies demonstrated by investors in the stock market (Ellis, 1991). The ABC Model is based on the primary model with C-behavioral consequences (behavioral anomalies, positive or negative) that arise from B- core beliefs (affective and cognitive which contain both rational and irrational elements) triggered by various types of A- activating events. Through this model, the root cause of irrational human behavior can be understood logically by the theory of causation, leading to the disposition bias.

Disposition bias is derived from loss aversion; one of the basic phenomena of choice under both risk and uncertainty, disposition bias

indicates that losses loom larger than gains (Kahneman & Tversky, 1984; Tversky & Kahneman, 1991). Prospect Theory explains disposition through three main components, namely, activating events, beliefs and behavioral consequences, as explained in the ABC model (Ellis, 1976). Sentiment contributes to the model as a moderating factor. Investor Sentiment in the state (optimistic or pessimistic) induced by a particular (favorable or unfavorable) event. The proxies of investor sentiment influence investor decision making (Baker & Wurgler, 2006).

The ABC model was tested by (Brahmana et al., 2012) to investigate psychological biases and day-of-the-week anomaly. These researchers tested whether the day effect combined with the theoretical ABC model. The scholars tested day-of-the-week anomalies (DOWA) empirically in the stock market using the ABC model, and they explored the role of psychological biases on the DOWA. They were able to conclude that the five psychological factors might influence the DOWA.

Every investor desires to make optimal investment decisions (Sharpe, 1964), in such a way that they can maximize their wealth. According to (Merton, 1987), optimal and rational investment decisions depend on advanced financial knowledge. Standard finance assumes that people have complete information and make rational decisions all the time. Imperfect information (Bikhchandani et al., 1992), bounded rationality (Pompain, 2006), anomalies (Ajmal et al., 2011), fundamental heuristics (Baker & Nofsinger, 2010), psychological biases (Baker & Nofsinger, 2002) or behavioral biases (Shefrin, 2007) and psychological accounts of investors' mental prestige play a key role in understanding irrational decision making. These research findings have been critically evaluated in the literature review.

Most individuals are averse to losing realization. Due to this reason, investors continue to keep their stocks while their prices are reduced. The expectation is that the price will rise the next day. (Shefrin & Statman, 1985). The findings proved that the disposition effect is not a laboratory experiment but shows up in real-world financial markets as well. The causes for this are not identified in this study, but the implications have been closely monitored.

The existence of disposition bias in a market may have different implications on that market's performance. One of the main implications is the price reversal of losing and winning stocks due to the buying and selling pressures inflicted on those two stocks, respectively (Bandara, 2012). This

particular research study is based on the Colombo Stock Exchange (CSE) over the period 2006 to 2010 using 20 stocks. Secondary data were used, and the study concludes that unobservable factors (firm-specific and time-specific factors), such as the disposition effect, affect individual investor behaviors. The findings reveal a disposition bias, but the reasons and causes for this disposition have not been found, as per previously mentioned articles.

Behavioral biases significantly impact investor behavior on the Colombo Stock Exchange (CSE) (Kengatharan & Kengatharan, 2014). The results of this study were summarized based on three hypotheses. The final results revealed that heuristics, market, prospect and herding impact the investment decisions of individual investors in the CSE. The cross-sectional design was used to collect quantitative data, and data synthesized from the questionnaires were sent to individual investors in the CSE. The data collected from questionnaires provide a basic understanding of the factors affecting investors' decisions in the CSE. Questionnaires were sent to respondents chosen using the stratified random sampling method. Stratified sampling ensures that the sample is distributed in the same way as the population (Bryman & Bell, 2007).

The Likert scale used (Likert scales are rating scales used for soliciting respondents' opinions and attitudes) ranged from 1 to 6: strongly disagree, disagree, no opinion, agree, and strongly agree.

There was a finding on disposition bias among individual and team investors, where the researchers have found and experimentally analyzed the disposition effects of team and single investors. The findings highlight that decision bias occurs in both scenarios. (Rau, 2015) However, the effect is more pronounced for team investors. Moreover, the data show that teams suffer less capital losses than individuals. At the same time, they tend to realize more capital gains than single investors. The study was based on secondary data and determined the proportion of gains realized (PGR) and the proportion of losses realized (PLR). The PGR (PLR) is the number of realized capital gains (losses) divided by the total number of capital gains (losses), which could be potentially sold. The same concept was tested by (Odean, 1998) using 10,000 individual stockbroker accounts.

One study confirmed that the disposition effect in a simple risky choice happens when choices are taken consecutively. However, when choices are planned, and a contingent (option) plan is defined, a reversal in the disposition effect is observed (Ploner, 2017). This researcher further

recognized and argued that a reverse disposition bias will be observed when choices are planned, with losers less likely to hold on to their investments than in the sequential condition in which no reaction to losses are planned. While winners' behaviour does not significantly differ across the two choice protocols, losers' behaviour changes significantly, thus reversing disposition bias. A new insight revealed by this research was the role of investment planning on the reversal of disposition bias.

The findings of the study by Ahmad (2019) show that extraversion, industriousness and risk-attitude are associated with disposition bias. This suggests that investors with extraversion and industriousness traits are more optimistic (positive) and rely on their skills, knowledge and experience to make investment decisions (Ahmad, 2019). The data were collected from undergraduate and post-graduate students from two well-known universities in Peshawar, Pakistan. A total of 405 students partook in the exercise, and 396 questionnaires were used for data analysis. The results revealed that risk-attitude negatively moderates the association between extraversion, agreeableness, and investors' disposition bias This proves that investors with a high level of extraversion and agreeableness under risk attitudes have a lower tendency to exhibit disposition bias. Risk attitude helps individuals (those with extraversion and agreeableness) to carefully select, analyze and, update portfolios. The arguments of (Ahmad, 2019) are supportive and are in line with the argument built by (Durand et al., 2008) who point out that "personality is the main driver of individual behavior". The above researchers suggest the importance of real-time investor data to capture investors' actual behavior, which would lead to more accurate results (Durand et al., 2008).

Another research study provides evidence that among the behavioral factors, anchoring, disposition effect, overconfidence and risk perception have a considerable positive or negative influence on investors' investment decision making on the CSE (Siraji & Buvanendra, 2019). These researchers identified and explained gender representation as a moderating effect on the relationship between behavioral factors such as anchoring, disposition effect, herding, overconfidence, risk perception and stock investment decision making. The study was conducted as a survey of individual investors on the CSE. The primary data were collected using a standard questionnaire based on a five-point Likert scale. Ultimately, 405 usable questionnaires were received. However, there are very few research articles on disposition bias in the Sri Lankan context. Comparatively,

western countries are rich with behavioral finance studies, both primary and secondary studies.

Disposition bias is affected by age, and herding bias is influenced by profession. The study further explains the impact of demographic features such as gender, age, income, and occupation on stock investors' investment behaviour in Indonesia (Elizabeth et al., 2020).

Scholarly articles from the 1950s came up with different arguments and models. At that time, it was popular and common for most scholars to follow Odean (1998), secondary data model, to test disposition bias, where the model was developed through daily share prices. Another set of scholars used only one variable to test the existence of disposition bias in the stock market. A few scholars recognized the impact of psychological factors on disposition bias and the causes of disposition bias. However, the reasons that drive the disposition effect have not been comprehensively addressed in the past literature, and therefore, the current study aims to fill this research gap.

Hypotheses and Conceptual Model

The conceptual model derived from three independent variables, one mediating variable, one moderating variable and a dependent variable is illustrated in a conceptual framework. Activating events, beliefs, and consequences are considered independent variables; loss aversion is considered as a mediating variable; investor sentiment is regarded as a moderating variable, and disposition bias is considered as a dependent variable. The eleven hypotheses developed as follows.

The Impact of Loss Aversion on Disposition Bias
Hypothesis 01–

    There is a positive relationship between activating events and the loss aversion of individual investment decisions

Hypothesis 02–

    There is a positive relationship between core beliefs and loss aversion of individual investment decisions

Hypothesis 03–

    There is a positive relationship between behavioral consequences on the loss aversion of individual investment decisions

Hypothesis 08–

There is a positive relationship between loss aversion and the disposition bias of individual investment decisions

Hypothesis 09 –

There is a positive relationship between activating events and the disposition bias of individual investment decisions mediated by loss aversion

Hypothesis 10 –

There is a positive relationship between core belief and disposition bias of individual investment decisions mediated by loss aversion

Hypothesis 11 –

There is a positive relationship between behavioral consequences and disposition bias of individual investment decisions mediated by loss aversion

The Impact of Activating Events on Disposition Bias

Hypothesis 04 –

There is a positive relationship between activating events and individual investment decisions' disposition bias

The Impact of Core Beliefs on Disposition Bias

The argument is that for emerging markets such as Sri Lanka, it is essential to test this for the betterment of investor decision-making.

Hypothesis 05 –

There is a positive relationship between core beliefs and individual investment decisions' disposition bias.

The Impact of Behavioral Consequences/ Emotions on Disposition Bias

Hypothesis 06–

There is a positive relationship between behavioral consequences and individual investment decisions' disposition bias.

The Impact of Investor Sentiment on Disposition Bias

Hypothesis 07 –

Investor sentiment moderates the positive relationship between activating events, beliefs, behavioral consequences and disposition bias of individual investment decisions.

The main hypotheses developed and it is given in figure 1.1
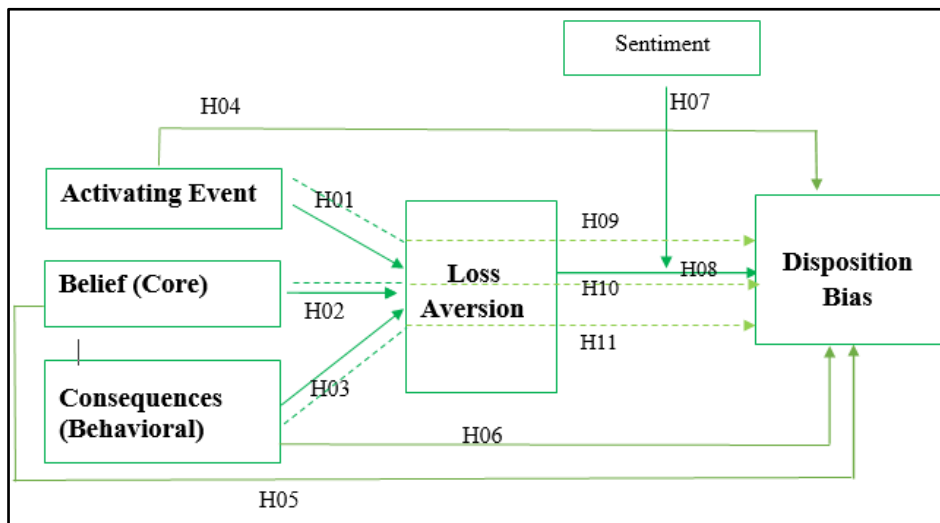
Figure 1.1 - Conceptual Model of the Study
Source: Author 's data

Figure 1.1 was developed based on the two theories, the Prospect theory and the ABC model. The ABC Model (Ellis, 1976) explained the three main causes of disposition bias: an activating event, core beliefs, and behavioral consequences. The feeling is in line with experiences, core evaluations (attitudes) regarding investment decisions, and emotional behavior. The above said three antecedents lead to loss aversion. The dotted lines represented the mediation impact of the variables. The assessment of an alternative's outcome comes from individual personal judgment based on mental shortcuts in an uncertain situation with fast decision-making. (Tversky & Kahneman, 1973, 1974).

Methodology

The unit of analysis is individual investors in the Colombo Stock Exchange (CSE). Based on the availability population number (647,584), the sample size was calculated using Solvins's formula $n = N/(1+Ne^2)$. According to the Solving's Formula, the sample size calculation answer is given as 242 minimum responses out of investors of CSE at 95% confidence level. The data analysis process through SPSS AMOS software 22.0 where collected 315, which of nine excluded due to incompleteness; finally filtered as 306 pure responses for the study.

Data Analysis and Results

A pilot study was conducted with 30 respondents (individual investors) to assess the questionnaire's face validity and reliability which Cronbach alpha is 0.737 and Pearson correlation Analysis closer to zero proof that the validity and reliability.

The multivariate assumptions, homoscedasticity, normality and multicollinearity, were assessed and confirmed. For all items, the factor loadings were above 0.7, excluding one variable, 'Activating Events". However, the variable could not be excluded due to the theoretical link to the model. Further, the Cronbach alpha value was greater than the 0.7 level. The Cronbach alpha value test was carried out to test for consistency and reliability.

Measurement Model

Confirmatory Factor Analysis (CFA) with Structural Equation Model (SEM) was evaluated through the AMOS 22.0 version with a sample size of 306. The final results of the descriptive statistics, reliability and validity tests are given in Table 01.

Variable	Number of Items	Mean	Standard Deviation	Cronbach Alpha	CR	AVE
Events	02	4.13	.47	.351	.46	.50
Belief	03	3.71	.65	.822	.66	.40
Behavioral consequences	03	3.73	.62	.666	.68	.41
Loss Aversion	02	4.09	.55	.605	.08	.32
Investor Sentiment	22	3.74	.75	.946	.97	.62

Table 01: Descriptive Statistics, Cronbach's Alpha, CR, AVE
Source: Author Created based on SPSS AMOS output

The GOF (Goodness of Fit) indices confirmed the appropriateness of the model. For the measurement model, all correlations and standard regression weights were significant at the 95% confidence interval. Moreover, the GOF results proved that the absolute fit indices validate the fit between the observed data and the model. The incremental values being close to the 01 levels, and within the range 0.290 - 0.377, confirmed that the model fit was good (Hair et al., 2010). Therefore, the model reported

satisfactory GOF indices and the present study validated the fit between the observed data and the model.

The first structural model to test Hypothesis 01: *There is a positive relationship between activating events and loss aversion of individual investment decisions.* The resulted in fitness indices that the β= 0.113 and P-value (.337) > 0.000 support the rejection of the hypothesis, which says that there is no positive relationship between activating events and loss aversion.

Hypothesis two (T*here is a positive relationship between core beliefs and loss aversion of individual investment decisions*) resulted in the β= 0.585 and P-value (.949) > 0.000 supports the rejection of the hypothesis which says that there is no positive relationship between core beliefs and loss aversion.

Hypothesis three (*There is a positive relationship between behavioral consequences and loss aversion of individual investment decisions*) resulted in the β= 0.212 and P-value (.984) > 0.000 ensuring the rejection of the hypothesis which says that there is no positive relationship between behavioral consequences and loss aversion.

Hypothesis four (*There is a positive relationship between activating events and individual investment decisions' disposition bias*) resulted in the β= 0.091 and P-value (.483) > 0.000 supporting the rejection of the hypothesis which says that there is no positive relationship between activating events and disposition bias.

Hypothesis five (*There is a positive relationship between core beliefs and individual investment decisions' disposition bias*) resulted in the β= 0.462 and P-value (.975) > 0.000 support the rejection of the hypothesis which says that there is no positive relationship between core beliefs and disposition bias.

Hypothesis six (*There is a positive relationship between behavioral consequences and individual investment decisions' disposition bias*) resulted in the β= 0.168 and P-value (.71) > 0.000 ensures the rejection of the hypothesis which says that there is no positive relationship between behavioral consequences and disposition bias.

Hypothesis seven (*Investor sentiment moderates the positive relationship between activating events, beliefs, behavioral consequences and disposition bias of individual investment decisions*) resulted in the β= 0.126 and P-value (.000) > 0.000 ensures the acceptance of the hypothesis

which says that there is a moderating impact from investor sentiment on the relationship of the irrational behavior of disposition bias.

Hypothesis eight (*There is a positive relationship between loss aversion and disposition bias of individual investment decisions*) results in the β= 0.09 and P-value (.023) > 0.000 support the acceptance of the hypothesis; which says that there is a positive relationship between loss aversion and disposition bias.

The mediating impact was tested in Hypothesis nine (*There is a positive relationship between activating events and disposition bias of individual investment decisions mediated by loss aversion*), Hypothesis ten (*There is a positive relationship between core belief and disposition bias of individual investment decisions mediated by loss aversion*) and Hypothesis eleven (*There is a positive relationship between behavioral consequences and disposition bias of individual investment decisions mediated by loss aversion*). The mediating impact was that of activating events, beliefs and behavioral consequences through loss aversion towards disposition bias. The mediating effect of the model was tested via direct and indirect pathways using the AMOS 22 version. There was only one partial mediation detected for the relationship between activating events and disposition bias through loss aversion. The remaining two mediations were not significant, nor were there any partial or full mediations detected (belief, disposition through loss aversion; behavioral consequences, disposition through loss aversion).

The data analysis revealed that a strong mental behavioral bias leads to disposition bias. The theoretical ABC model embedded to test its contributions did not add value to the findings. An important factor in prospect theory, which is loss aversion cognition, was found to be a key driver for the execution of disposition bias in the Sri Lankan context. Therefore, in the Sri Lankan context, it is necessary to overcome a "loss averse" attitude to prevent disposition bias. This is the positive contribution of the study to individual investors, stockbroking advisors and potential investors in Sri Lanka.

Limitations and Directions for Future Research

As previously explained, disposition bias is one of the psychological biases in behavioral finance. There are more than seventeen (17) psychological biases according to scholarly articles (Kumar and Goyal, 2014), (Zahera and Bansal, 2017). The current study only focused on

disposition bias which was recognized initially by Kahneman and Tversky (1979). The study is limited to one bias, though several biases may have been in operation concerning individual investors' decisions (Kengatharan and Kengatharan, 2014), (Siraji and Buvanendra, 2019). The sample size was limited to 306 individual investors since it was difficult in practical terms to cover the entire population. If the study were done on the entire population, the results may have been different. Also, in this study, investors were taken as a whole in a gender-blind manner whereas (Siraj and Buvanendra, 2019) have found that gender has a significant moderating effect on bias. Future researchers can replace the ABC model with another appropriate model that is more suited for psychological biases.

Conclusion

The study's main aim was to contribute to the existing knowledge on the behavioral bias of disposition and its antecedents affecting individual investors in the Sri Lankan market. Studies have been conducted to identify whether biases exist in the stock market or not. However, there have only been limited studies on the antecedents of biases leading to irrational decision-making patterns. Disposition bias is led by the loss aversion context of each behavior. Also, the disposition is significantly moderated by the investor sentiment for the irrational decision-making. An investment cannot be recognized as positive or negative initially, but its consequences have to be borne by the investor. The leading cause for the irrational behavior of the Sri Lankan market is loss aversion. The findings of the current study can be applied to the Sri Lankan context, where future research can be designed on a different platform to test the overall model of biases. The knowledge on investors' behavior provided by this study can be further extended and honed for better outcomes with the suggestions mentioned above. These suggestions might be a useful guide for individual investors to design their share portfolios and to make sound investment decisions.

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Online Feminism for an Inclusive Democracy in Sri Lanka: Using Digital Platforms to Increase the Gender Representation and Political Engagement

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Abstract

Women's political participation in Sri Lankan politics was widely discouraged by the male-dominated patriarchal political system. However, social solid development indicators for women in health, education and social service do not necessarily translate into increased political representation in Sri Lanka. In such a context, this paper attempts to explain why it is essential for women's representation in the parliament and how modern digital awareness-raising tools such as 'Social Media and Online Feminism' could be helpful to empower women as well as to educate the entire public on this issue. However, the lack of technological facilities and digital infrastructure in rural areas are critical concerns. Therefore, this paper suggests that identifying the world web as a fundamental human right is essential with advanced technological development in the modern world because many human rights rely on digital technology. The perspective given in this paper helps to strategically think of this issue and find creative solutions to build an inclusive democracy in Sri Lanka. The suggestions of this paper would help the Sri Lankan policymakers reduce the barriers and improve the overall quality of life by acknowledging the internet as a human right.

Key Words: *Online Feminism, Inclusive Democracy, Representation, Gender Equality, Human Rights*

The global average of women's representation in politics is 24.6%, in the Asian region, it's 20.5%, in Sri Lanka, it's 5.3%, with the women population being 52%. There is very little done to address the broad discrimination against Sri Lankan women or provide them protection and empower them to be equal partners in the country's growth and progress. We need to be cautious and supportive, so women do not feel intimidated by politics perpetuated by the ruling class.

Lihini Fernando,
Female Politician and attorney-at-law in Sri Lanka.

Although Sri Lanka has achieved so much progress in education, health and most of the social indicators, the representation of women at every level of governance remains abysmally low. Since the country's transition to democracy began during the 1930s, the representation of women legislators at the national level has never exceeded 7% throughout Sri Lanka's electoral history (UN Women, 2022). According to Sathya Karunarathne, the Research Executive at Advocata Institute, Sri Lanka did not break the glass ceiling with the top political leadership of Prime Minister Sirimawo Bandaranaike and President Chandrika Bandaranaike Kumaratunga because the men in their lives were deep-rooted in politics (cited in Kamdar, 2020).

In such a context, the topic of increasing female representation in Sri Lankan politics has been subjected to much exciting debate in recent years. Under-representation globally can be attributed to several factors. At the same time, "the stereotypical notions about the 'right' place of women in society" have been identified as a critical factor in why women are often reluctant to play a significant role in Sri Lankan politics (Perera, 2015). This paper explores whether 'Online Feminism' is an effective tool amongst Sri Lankan social media users to increase awareness of inclusive gender representation in Sri Lankan Politics. Digital communication platforms play a vital role as the modern form of awareness-raising in changing the Sri Lankan public discourse on women's capabilities and political rights. However, to facilitate open access to current communication channels for urban and rural communities, recognizing the right to digital technology as a fundamental human right in the 21st century is necessary since rural communities represent critical game-changing votes in Sri Lankan politics.

Do we need women in politics?

Political participation as a human right grants citizens "the right to take part, directly or through representatives, in the conduct of public affairs and government, and to vote at genuine periodic elections based on universal suffrage and the secret ballot" (Asiedu et al., 2018 p.2. as cited in Steiner, 1988; Bunch, 1990). However, for ages, women's political participation has been a highly debated topic in a patriarchal and male-dominated society. Article 07 of the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW), which the United Nations General Assembly adopted in 1979 (OHCHR, 2022), called for the state parties to take necessary steps to eliminate discrimination against

women in the political spheres by ensuring both women and men have equal rights to vote, to be eligible to vote, to be eligible to hold public office, to participate in the policy formulation and implementation, and to participate in non-governmental organizations. Accordingly, the meaningful participation of women in policy-making leadership roles at both national and local levels has become a critical focus of the global development policy. However, some may doubt why it matters if women become political leaders or play a role in decision-making.

There's a broader discussion and growing concern in democratic countries on how to build a good parliament. The Good Parliament is "truly representative, transparent, accessible, accountable and effective in its many functions" (Childs, 2016). In building a good parliament, women's political, social and economic inclusion highly matters. It promotes gender equality by challenging the socio-political structures that perpetuate a culture of women's subordination in the private and public spheres (Asiedu et al., 2018, p.2). In the theoretical concept of democracy, "power belongs to the ruled, not the rulers" (Johnston, 2001, p. 296). Representative democracies are frequently said to need competent men and women to function effectively so that they value gender equality. Gender equality is another crucial theoretical concept that focuses on both men's and women's progress through different aspects of development, which are simplified into capabilities, opportunities and empowerment/ agency (Kabeer, 2005; Beer, 2009). Among the various aspects of gender equality, the political empowerment of women is one of the most critical aspects. This includes active political representation and improved decision-making capacities at all governance levels. Overall, political empowerment of women helps advance gender equality and affects both the range of policy issues that get considered and the proposed types of solutions.

Active political participation can lead to various gains for democracy, such as more excellent responsiveness to the needs of citizens, increased cooperation across parties and a more sustainable future (Perera, 2018). This effort also increases the number of women in the parliament, improves policy outcomes and promotes inclusiveness in public spheres (Asiedu et al., 2018, p.2). It challenges the dominant power structures of men and relations that undermine the consideration of women's needs and interest in policy-making. Women's representation in governance is significant for promoting a greater diversity of views in government, combatting damaging sexist notions that subjugate women and diminish their capabilities and value, and

because fundamentally, it aligns with their right against discrimination based on gender (Philips, 2015).

Research indicates that the sex differences of legislators have a more significant impact on their policy priorities. An analogical increase in policymaking emphasizes quality of life and reflects the importance of families and minority groups when more women are elected to run the office (Pepera, 2018). The democratic process requires the participation of all citizens. Any deviations from this can create unfair and unequal power-sharing between men and women. The exclusion of women can further result in inequitable social policies, unfair political processes and more incredible frustration among citizens. Thus, increasing women's political representation is vital to transforming countries into inclusive democracies and fostering socio-political norms.

Online Feminism: As a form of awareness-raising in the 21st century

Being a patriarchal and traditional-minded society, Sri Lanka suffers from the gendered nature of politics and entrenched stereotypes that privilege men as leaders and women as caregivers. (Philips, 2015 as cited in Wickramasinghe & Kodikara 2012; Krook & Norris 2014). This has had a sustained impact on women's exclusion from politics and policy, marking leadership roles. Although the previous Sri Lankan government (2015-2019) introduced a 25% mandatory quota for women to enter the local government in 2016, the expected results have not been received due to women's lack of interest and political awareness. Hampered by the social norms surrounding the 'role of a woman,' most females lack the required competence and political knowledge to run a successful election campaign on par with the male candidates. (Perera, 2015). This is not healthy, considering the active roles that many Sri Lankan women are playing in their communities through various social service activities. To address these identified gaps, awareness-raising among women should be recognized as the most prominent solution. However, it should be innovative and strategic to increase the level of confidence of women to fight against male-dominant political systems.

Women's rights movements and feminism have turned to digital technologies and social media platforms in recent years. Many activists and civil society rights-based organizations worldwide use social media platforms to dialogue, network, and organize against contemporary human rights issues, sexism, misogyny, and rape culture (Mendes et al., 2019). The

emergence of feminist campaigns such as #MeToo, #BeenRapedNever Reported, #distractinglysexy and #NotYourAsianSidekick are part of a growing trend of digital resistance and challenges to sexism, patriarchy, and other forms of oppression. (Small, 2020)

There has been a growing social media presence among Sri Lankans, especially during the pandemic. Many social services such as education, jobs, health and food services were provided online. According to the data shared by datareportal.com (2022), there were 11.34 million internet users in January 2021 out of the 21.46 million overall population in Sri Lanka (Jan 2021), while 8.20 million social media users were recognized during the same period. This social media presence has been divided among Facebook users (7.15 million – Meta advertising resources), YouTube users (6.68 million – Google's advertising resources), Instagram users (1.55 million – Meta advertising tools), Twitter users (296.7 thousand – Twitter's advertising resources) and LinkedIn users (1.50 million – LinkedIn's advertising resources). The above statistics show that approximately 40% of the population has access to the internet and social media. Comparatively, Facebook and YouTube have become the most popular social media platforms in Sri Lanka.

Considering the social media presence in Sri Lanka in politics and current affairs, Sri Lankan social media spaces have been very active during the elections and crises. The best example is the ongoing social media campaigns carried out by the general public against the incapacity of the Sri Lankan government to manage the current economic situation in Sri Lanka. *#GiveUsOurStolenMoneyBack, #GoHomeGota, and #GoHomeRajapakshas* hashtags have been trending in Sri Lanka from March to May 2022. Many people have gathered on the roads due to social media campaigns and increased levels of networking (Raymond, 2022). Social media campaigns can be an innovative form to raise awareness of increased women's participation and political engagement in such a context. Small (2020, p.181) argues that (as cited in Golbeck, Ash and Cabrera 2017, para.11) social media provides a digital mediated consciousness-raising space for intersectional feminism to flourish, support and public awareness of feminist issues. Small (2020) further states that social media channels such as Twitter create a "space – even a community" for communication, discussion, debate, support and awareness of the issues facing modern women and girls.

Primarily, social media conversations move beyond social group conversations instead of becoming a sustained global conversation between women and girls. Sometimes it can also raise awareness outside the community (Small, 2020, pp 184-186). Taking the Sri Lankan example protests against President Rajapaksa's government since March 2022 started from a small group discussion. It has covered the entire island nation and reached the Sri Lankan diaspora (NewsWire, 2022). A picture of a woman taking an infant baby who participated in the silent protest in front of the President's house has become the most popular in April 2022. Many Sri Lankans have used the same picture as their profile pictures on their Facebook profiles to show women's and children's struggles amidst the worsening of the economic crisis (Wickremesekera, 2022). Online feminism also can affect the direction of the feminist movement; it also has a personal impact on participants. This can be exemplified by the Twitter campaign executed by the Colombo-based Sri Lankan activist against the advertisement of the multinational company showing stereotypical patriarchal attributes (Hettige, 2020). This campaign also received a broader reach on both Facebook and Twitter platforms. Many women and girls shared their personal experiences and thoughts about their struggles while living a feminist life in the male-dominant system.

Above opportunities using online feminism as a form of awareness-raising and the ongoing Sri Lankan economic crisis are examples of how effective social media campaigns can be, demonstrate the transformational power of modern digital technologies within gender politics. The younger generation is very much closer to the world of social media, and therefore, it is essential to generate discussions on women's and girls' issues. A theme like increased women's political participation and women's political engagement could be more relevant for younger generations. Thus, social media platforms that are more popular among younger generations should be used effectively as a critical platform for awareness-raising in this digital age.

Can online feminism reach rural communities in Sri Lanka?

Social media users in Sri Lanka have significantly increased by 1.5 million (+23%) between 2020 and 2021, while internet users in Sri Lanka have also increased dramatically by 800 thousand (+7.9%) during the same period (datareportal.com, 2022). This has happened mainly due to the Covid 19 pandemic and associated factors such as expanding virtual services and

communications. However, of the 21.46 million overall population in Sri Lanka (Jan 2021), only 18.8% live in urban areas, while the remaining 81.2% live in rural areas (datareportal.com, 2022). The majority of the rural regions struggle to connect with the internet and social media platforms due to the lack of technological devices and network signals. In this context, social work organizations and service providers struggle to reach rural women and girls via online feminism and social media campaigns to raise awareness of women's political empowerment.

Internet is not a luxury service anymore, especially during a pandemic. The United Nations (UN) has declared (in 2016), even before Covid 19 pandemic, that it considers the internet to be a human right (Howell & West, 2016). This was added to the Article 19 of the Universal Declaration of Human Rights (UDHR), which states: "Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers" (Howell & West, 2016). Moreover, the section 32 adds "the promotion, protection and enjoyment of human rights on the Internet" and another 15 recommendations that include the rights of people who financially depend on internet access.

This addition also applies to women, girls, and other minorities heavily impacted by the digital divide. Covid 19 has exposed the harsh reality that not everyone has internet access in their homes, including millions in the developed countries in the world as well. Accordingly, The UN's suggestion that internet access should be a human right provided by the government has become more relevant now because other human rights, including the right to work and education, cannot be adequately realized during public health emergencies. According to many recently conducted studies, internet access is essential in the modern world for employment, education, and ensuring other human rights such as freedom of expression, freedom of association, and access to information (Barry, 2020).

Considering the Sri Lankan government's efforts on digital technologies, former state minister of digital technology and enterprise development, Namal Rajapaksa stated in early 2022 that transforming Sri Lanka into a technology-based society is one of the key national policy objectives of their government and, therefore, they would make sure to cover the entire country on broadband for telecommunication coverage with 5G speed hopefully by the end of their regime (Telecom Review, 2022). He

further stated that his ministry had launched the 'Networking to Villages' (Gamata Sanniwedanaya in the Sinhala language) program to establish towers in rural Sri Lanka and provide coverage in all parts of the country. However, although the Sri Lankan government has made some substantial efforts to transform the country into a digital hub, the government has not yet accepted the 'internet' as a human right politically or legally. This has been exemplified by the nationwide social media restriction Sri Lankan President Gotabaya Rajapaksa imposed in April 2022 to control the virtual networking of the public against his leadership (netblocks.org, 2022).

Many human rights activists, journalists and legal practitioners had condemned this decision of the President and took action to report to the Human Rights Commission (HRC) of Sri Lanka (Raymond, 2022). The HRC has noted that imposing a social media ban violates human rights and pressured the government to ease the restrictions immediately (Farzan, 2022). In this sense, identifying internet access as a human right is extremely important to empower women and protect people's fundamental rights such as freedom of expression, association, and the right to information. Authorities should understand that fundamental rights and the internet are inter-connected in the modern world. For example, access to health coverage, one of the fundamental rights for many Sri Lankans, can now be accessed thanks to technology. Accordingly, rural communities that do not have enough technological infrastructure for the internet will enjoy less protection of specific rights. Therefore, it needs to be recognized as a fundamental right within its legal framework to ensure access.

Conclusion

Women have been depicted as politically ineffective, unmotivated, naive, invisible and dependent upon the power of men. The primary reason for women's low political representation in Sri Lanka because women cannot be decision-makers, in contrast to men, as their skills do not lend themselves to life in the public sphere. Additionally, there is also a belief that women would not be able to devote the time and energy to run the office precisely because they are often also caregivers and homemakers (Krook & Norris 2014). In a country where women have achieved more significant progress in education, volunteering and social service activities, women's political representation is vital to building an inclusive democracy with an excellent representative parliament.

Online feminism, a revolutionary networking platform with the development of globalization, can contribute as an effective mechanism to increasing women's confidence by empowering them ideologically and emotionally. It can also act as a new digital tool to expand the public's awareness of the importance of representative democracy and gender equality at all levels. However, it is essential to empower and reach all communities irrespective of everyone's geographical location, including rural communities, as they represent nearly 80% of the game-changing votes in Sri Lankan politics. Politically it is imperative to recognize the right to internet access as a fundamental human right that would encourage responsible authorities to establish digital infrastructure soon within the next few years. In conclusion, it is essential to create an environment for all women to succeed and feel safe in the political system, leading to an empowered society being more receptive toward 'female leadership' and achieving gender equality in politics.

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Representation of Language in Sri Lankan English Newspapers: Key Word Analysis with reference to two English Newspapers

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Abstract

It is more often concerned by linguists that due to their physical absence and less voice before the public negatively impact to create a less recognition on Language and Linguistics related topics in newspapers even though, they are practiced in every aspect in the society. Considering a key word analysis employed in Corpus Linguistics, this study investigated to which extent Language and Linguistics related areas are represented in the News section of the Sri Lankan English newspapers. The sample included the selected news articles from the electronic versions of two newspapers that had been published for six months in 2021. The total searched word count of this corpus was 15636 which was analyzed for key words through Browserling online word frequency counter to investigate the occurrence of the terms <language>, <languages>, <linguistics> and <education> in the word list. This corpus-based methodology revealed that these key themes have not become interesting areas in Sri Lankan English newspapers. Similarly, the semantic fields that are related to these key themes are intertwined with current socio-political discussions in the country. Furthermore, the proper nouns like names of leading figures in different fields of the country deserve a prominent place in this media discourse as well. Overall results of this study indicate that the Language and Linguistics related themes are to be more positively addressed in news articles as they are more commonly practiced in authentic situations among the public. Also, more research has to be conducted related to corpus-linguistics by using the International Corpus of English – Sri Lanka (ICE-SL).

Key Words: *newspapers, Sri Lanka, key word analysis, language, linguistics*

Introduction

It is more often concerned by linguists about their physical absence and less voice before the public, influence to create certain misinterpretations of language in media, whenever aspects of language

science are discussed with general audience. "The Journal of Sociolinguistics" describes the views of researchers regarding misinterpretations of ideologies of the language and linguists via media. (Aitchinson, 2001; Milroy, 2001; Herler,1998). These research studies uplift the malfunctional relationship between language and media.

Media language has always attracted the attention of linguists, particularly Applied Linguists and Sociolinguists. It further reveals some practical reasons for this popularity of media in the field of Sociolinguistics; easy to access language data for research, access to a large component of written or spoken language data of the general public, it is interesting explore how media touches the demographic variations of the public and they act as the voice of different cultural, political and social views of the public. These points provide the evidence with the huge impact of media on the representation of language use in a selected context. The impact of it would create a large influence of the ideology of the general public, which truly negatively makes the linguists unhappy.

Newspapers play a major role in the Sri Lankan context keeping it as a powerful source of information eventhough there is a rapid development in terms of media. The readers still explore many in different fields in terms of locally and internationally, especially through English newspapers. In the recent past the globe experienced new areas in terms of education, health and so on with the outbreak of Covid-19 pandemic which deviated some significant topics and themes usually addressed through the newspapers. Linguistics and Language are two mighty concepts in the world which enjoys a power of creating a generational transience in the discipline of Linguistics. These concepts address the human issues in a genuine manner but they are not well highlighted in today's newspapers due to certain issues.

This crucial situation has been addressed in the sub disciplines of Linguistics called "Media Linguistics" as well as in Sociolinguistics"". Media linguistics studies how language is used in media and also it further reveals that, this discipline has its roots in conversational analysis in Sociolinguistics. Mass media texts such as excerpts from newspapers, television and radio become the target objects of this sub discipline. Moreover, the Corpus Linguistics which is related to producing corpora in different sub fields relevant to studies. In these studies, mini-corpora are compiled and data are analyzed thorough software toolkits like Browsling and Antconc and WordSmith. This analysis can be done in ways like keyword analysis, concord and wordlists.

So that, the present study aims at discovering the representation of language in Sri Lankan English newspapers in the light of Media linguistics, Sociolinguistics and Corpus linguistics.

Research problem

Within Sri Lankan context, the subject area "Linguistics" is not that much taken into discussions on the stage of public relations at a satisfaction level. Many of the news articles in the news section are dedicated for the prominent political events while the Features display Art, Literature, History and other events. All these news productions are done in the light of language despite the fact that Linguistics and Language become least touched news areas in Sri Lankan English newspapers. Simultaneously, the writers do not show a positive tendency to express their views and preset study findings related to these two fields via Newspapers.

Within this context, it is necessary to intervene the way how the language related concepts or issues are represented through key words in Sri Lankan English newspapers. There are few published research articles on this area in Sri Lanka, keeping this research area still uninvestigated. So that this study investigates how Language and Linguistics related topics are represented in Si Lankan English newspapers.

Research Questions

1.   What are the key words occurring in the News sections of the English newspapers in Sri Lanka?
2.   To what extent Language related themes are discussed in   these newspapers?

Objectives of the study

-      To investigate the key words of language related news articles in Sri Lankan English newspapers.
-       To explore how language related themes are represented in the Sri Lankan English newspapers.

Literature Review

Key words are significant words which are related to the theme of a particular text in any code. They carry the meaning of it while embedding related concepts with the art of language. Moreover, the keywords in a text display the weightage given for each sub theme of the particular text. So

that, investigating the keywords in a particular text indicated the popularity of the particular area among the public approximately. This research area can be explored in the light of Corpus Linguistics which refers to compiling a database of a particular area exploit it in different ways to in explore answers to research problems and compare it with a larger existing corpus. Choe (2017) has conducted a research study on "Relating Key words to the "Top ten news of the Year" in Korean Newspapers, explores the relationship between the mechanically extracted words and the top ten news of the year". This research study employs the Dunning's Log Likelihood (LL) and chi-square (Scott & Tribble, 2006) which reveals 100key words in different point of views.

Corpus Linguistics

Corpus Linguistics quantitatively analyses corpora up to several million words of spoken and written language enabling the researchers to establish frequencies and probabilities of words and phrases often tighter with demographic characteristics of their users (Paltridge & Phakiti, 2015). This suggests that Corpus linguistics has become a key mode of linguistic inquiry throughout the history. Baker (2004) explains how a large compilation of electronic texts which is carefully sampled, contributes to the linguistic researchers to study the language representation of a particular variety. This broad area has been studied by a number of researchers: Corpus Studies of Lexical Semantics (Stubbs, 2001), Corpora and Applied Linguistics (Hunston, 2002), and Using Corpora in Discourse Analysis (Baker, 2006). A number of diachronic studies have explored many possible specific areas of Corpus linguistics.

Corpus Linguistic Studies in South Asia

The varieties in English in different parts of the world and their unique features which are bound with the demographical varieties have been addressed by a number of linguists and researchers. In his book: "Asian English Beyond the Canon", Kachru (2005) deploys the term "Asian Englishes" to introduce the varieties of English existing in South Asia. His robust claim, "The English language is discussed as a language *in* Asia, but not *of* Asia" (Kachru, 2005), opens up a new arena to the status of English in South Asia. It gives a more weight to the compilation of ICE versions of South Asian countries. It is a recorded electronic sample of written and spoken language varieties of a language used in a particular country. These

electronic documents also reflect a blend of Asian culture in different varieties of a foreign tongue (English) which provide the future researchers with evidence to explore specific areas in Corpus Linguistics as well as Sociolinguistics.

Corpus Linguistic studies related to English newspapers in Sri Lanka

This target area of Linguistics still has not been widely explored by the researchers in Sri Lanka. Only a limited number of published research papers are available in this field. Hettiachchi & Ranaweera (2012) conclude their research on "A Corpus Survey of Sri Lankan English in Selected Sections of Sri Lankan English Newspapers of Sri Lanka and the Implications for Writing Authentic Lesson Material in Tertiary level ESL Context", with the finding of Sri Lanka lexical items are present in Sri Lankan English newspapers which is contradictory to previous Studies"

International Corpus of English in Sri Lanka (ICE-SL)

The Sri Lankan component of ICE is a paramount importance with regard to empirical research into new Englishes (Bernaisch et al., 2020). It is comprised with two parts: the written part of ICE-SL and the spoken part of ICE-SL, after a collective effort of a collaborative team work of academics of the University of Giessen and the University of Colombo.

Present Study

This study adopts a corpus-based approach to explore the language construction in Sri Lanka English newspapers by investigating the key words of newspaper articles in News section.

Methodology
Approach

This research study focuses on investigating how language related issues are represented in Sri Lankan English newspapers through a key word analysis. As this intervention explores the frequency of the occurrence of language related words as well as semantic fields related to the key words this study can be identified as a mixed method approach. It focuses on investigating both qualitative and quantitative data.

Sample

The present study employs the electronic versions of two of the English newspapers in Sri Lanka "Sunday Observer". There are some

background reasons to select these particular English newspapers because they can be easily accessed through the archives under each section is the first and foremost reason behind this. Moreover, another reason is that the electronic versions of these newspapers are available in online and they are popular among the readers as well and have been used for research purposes even among the lowest number of published research studies related to English newspapers in Sri Lanka.

The News section was selected as the target area of this study because it comprises news related to the general public which is not limited only to a set of audience. The other news sections such as Features and Sports approximately target a particular audience as well as authors which limits the discussion of the general audience. As this research study focuses on the news of the general audience, it uses the News section as the target area. Moreover, this section is dedicated to the most up to date news items in the country which serves the value of the research as well.

News related to the any area related to language, linguistics and education was selected as the sample for the current research study. The selection was mainly based on the title of the news article as well as the content of the it They were extracted from the Sunday Observer and Sunday Times newspapers published from 01st 0f May to the end of October of 2021which covered a period of six months.

Data collection Instruments

The Sunday Observer and Sunday Times English newspapers from May to November 2021.

Procedure

This study is a corpus-based study regarding the language representation in Sri Lankan English newspapers. A corpus of texts collected from the Sunday Observer and Sunday Times e-newspapers which were published from May to October 2021 which covers a period of six months. Even though they are some more English e-newspapers freely available in the internet, the Sunday Observer and Sunday Times can be identified as popular English newspapers among the readers of Sri Lanka.

After selecting the sample for the research study, an electronic search was done to collect the relevant newspaper articles under three main themes "Language, Linguistics and Education". In some news articles these key words are there in the titles which the others imply the relevancy of the

articles to the themes in an indirect way. When the title of the research article and the contents displays any related above-mentioned topics were saved as a word documents. And then, they were converted in to electronic text files.

By collecting newspaper articles an electronic text file was created. After creating this sub corpus, the next stage of the research study was to identify the key words related to these terms. The key words are related to the frequency of occurrence of them in these particular texts.

Then, Browserling online word frequency counter was employed as the tool to create a list of key words in the generated electronic file. After that, a statistical analysis was done to investigate the occurrence of frequency of language related themes in selected texts.

Data Analysis

The frequencies of the occurrence of the node terms "language, linguistics and education "were measured through the Browserling online word frequency counter

Key words	Sunday Observer	Sunday Times	Total
<language>	-	9	9
<languages>	5	-	5
<linguistics>	-	-	-
<education>	33	73	106
Total number of search terms	6666	8970	15636

Table I: Occurrence of four terms across the two newspapers

The corpus generated by using the Sunday Observer newspaper had a word list of 6666 while the corpus of Sunday Times had 8970 words. Then each mini corpus was fed to Browserling online word frequency counter to generate the frequency list of the words. The analysis shows that the term/ node "language" had no any occurrence in the corpus created based on the articles in the News section of Sunday Observer. The articles were also selected based on the subject area of the news item. Additionally, the key word Languages has appeared in five times in this newspaper. This indicates that the language related area has been represented in to some extent in this newspaper. Next, this key word comes in 9 times in the same section of the Sunday Times newspaper during the selected period (from May – October

2021). This shows that the second newspaper also has given some palace in it to represent language related topics in the News section.

According to the data analysis, there has not been any discussion on Linguistics in the News section of in both newspaper indicating that this key theme has not become an interesting area in the print media. The writers of the articles who focus the general public through the news section seem not to consider Linguistics as an appealing topic to the readers. This further indicates that the area Linguistics is practically used in every aspect in the society in terms of Sociolinguistics, Applied Linguistics, Forensic Linguistics, Psycholinguistics and Media linguistics and so on the general public is not that much familiar with this subject area and its applications. This is kind of a negative remark for the linguists as well as students who study this area.

Next, the key word education has been occurred 33 times in the Sunday Observer and 73 times in Sunday Times showing that this field is addressed more frequently in the News section of the selected two newspapers. It marks the highest frequency in the sample of this research study. This became a very common topic in every media all over the world with the outbreak of Covi-19 pandemic situation because the education system underwent a drastic shift from many traditional methods to digital methods during this period.

Semantic fields	Types
Language	Book, Sinhala, Tamil, writers, publishing, reading, writers, Rotaract, Chinese, literature, edition, research, speakers, research, conference, faculty, college, departments, journal, lip-reading, Hindi
Education	University, student/s, schools, teacher/s, children, online, school/s, strike, salary, universities, principals, examination, youth, virtual, Kotalawala , educational , knowledge , studies , school children , ugc , teaching , lessons , higher, parents , study , professor , scholars , ministry, technology, graduate, curriculum, learning , allowance , sociology , primary , protest , Cambridge , examination , tuition , classroom , learning , syllabus , lectures, assessments , virtual
Health	Pandemic, Covid-19, people, vaccination, health, public, masks, spread, severe, donations, vaccine, AstraZeneca, doses, responsibility, booster,

Table II: Semantic fields and related types

The key words generated under this research study can be discussed in relation to the key semantic fields as in above. The lexical set in this chart belong to the same conceptual area. The first sematic field selected in this research study is Language. This semantic field is discussed articles in the News section of two newspapers in relation to the identified lexical terms. Next, the semantic field of Education is discussed with a large number of terms as in the chart because, many changes occurred in the field of education during the period of past one and half years. Especially the discussions online teaching. Kothalawala act and the protest of Teacher and principals influenced a lot in print media in the same period. This indicated how current issues are repeatedly reported in print medial while reducing other existing concepts in the society. Moreover, these social discussions are used for the popularity of politics also minimizing the use of newspapers for linguistics related research purposes.

Proper nouns

Both sub-corpora of compiled from News articles of two English newspapers reveal much more use of proper names related to the current themes in the society. Even though the news articles selected as the sample of the research through the topic of the news item according to the author's view, as today language, education and linguistics terms are intertwined with current issues in the country. Moreover, in any newspaper article corpora there are occurrences of the proper names of the leading political figures, government officers and social activists. However, the occurrence of proper names in the created two corpora are insignificant in frequency in comparison to the major key words.

Limitations

1. As the data for the research study was gathered during the pandemic situation, the expected data could not be obtained exactly. Many of the articles in the News section of both newspapers and generally in other media also were dedicated for Covid-19 related issues as well as much of the political issues as usual.
2. The time period taken for data collection was not enough due to the above-mentioned point. The research study would me more effective if the data collection was done for at least one year.
3. This corpus-based study is needed to be conducted by comparing the data with ICE-SL which could not be done due to time constraints.

However, the author intends to obtain the ICE-SL from the relevant scholars and extend this research in future.

Discussion

There is a need of a discussion on Language and Linguistics through newspaper in the Sri Lankan contexts as these areas are not positively addressed in print media. The linguists, researchers and the students who study these areas need to be pioneers in this task because the general public employs many more pragmatic functions of language and many sub-areas of Linguistics in authentic situations without any theoretical knowledge. This indirect highlight the descriptive Linguistics. The whole society is interconnected merely because of the functions of language and aspects of Linguistics. Therefore, the author intends to focus the attention of the above-mentioned parities to bring the topic before the public through print media. On the contrary, the data analysis indicates that some distant areas for the general public which are not practically used by the individuals are more frequently discussed through the newspapers due to political influence.

Future research

It is necessary to conduct more research on language representation in Sri Lankan English newspapers through key word analysis using a a large reference corpus. The gratitude should be paid for the scholars and professional who pioneered to compile both spoken and written corpora of Sri Lankan English. This data base is an assert for corpus-based studies in Sri Lanka. As an extension of the current research the author intends to obtain the ICE-SL from the relevant authorities to continue research on this area as this is still uninvestigated in the Sri Lankan research context.

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Application of Digital Technology for Film Restoration

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Abstract

The present study aims at identifying and examining the factors related to film restoration with no harm or minimal impact on the original work of its aesthetic values. A film is an audio-visual heritage that is also recognized as an artifact that should be preserved for the future generations and references. It not only provides an empirical database to the linear evolution of specific culture, society and industry, it enhances and advances the technologies utilized by the genre of artists to evolve a specific industry that is identical to its time, space and the norms and practices. Once the material that makes up cinematic creation is damaged, the quality and its history is deteriorated inherently. Restoration of film is process that involves repairing and reconstruction a damaged film. The traditional way of restoring a film is simply to originate a duplicate of the original piece in terms of extending the life span of the original work. The question is whether the matter of restoration is the matter of life span of the film. Modern technology and tech devices have provided with several opportunities to restore the film with its original values and elements making no harm to the original quality of art work. Thus, the present study focuses on the application of equipment provided by the digital technology for film restoration by using selected software i.e. DIAMANT, Phoenix, and Blackmagic Design DaVinci Revival Pro. The study was carried out by using a literature survey in selected archives and museums to identify the Sri Lankan films and film history, and the field survey and case study with the application of particular software to review and watch audiovisual media. The literature survey was further carried out to examine the international standards and methods on film restoration and the projects that have already been conducted successfully in the global industry. The selected films and the restoration software provided the necessary data that can assess the ability of reconstruction audiovisual quality by the digital restoration process..The study further revealed that the new challenges that are not visible in traditional restoration technology have been created.

Keywords: *Audiovisual Media, Celluloid Film, Film Preservation, Film Restoration, Restoration Software.*

ඡායාරූප සංරක්ෂණයට විද්‍යාත්මක ප්‍රවේශයක්
රවීන්ද්‍ර ප්‍රියන්ත ලාල්

පූර්විකාව

ආලෝක සිත්තම් කලාව නැතහොත් ඡායාරූපකරණය ලොවට හඳුන්වා දෙන ලද්දේ ප්‍රංශ ජාතික ජෝසප් නීප්සේ විසින් 1826 දි තම නිවසේ උඩුමහලේ සිට හේලියෝග්‍රැෆි ක්‍රමයට සටහන් කරගත් විදියක දර්ශනයක් සහිත පිළිබිඹුව සටහන් කරගැනීමත් සමග ය. (Davenport, 1999.p.6) (1 රූපය). නීප්ශේ විසින් තම විද්‍යාත්මක පර්යේෂණවල ප්‍රතිඵලයත් ලෙස සොයාගන්නා ලද මෙම අපූර්වතම රූප නිමැවුම් ක්‍රමය කෙටි කාලයක් යන විට ලොව පුරා බොහෝ රටවල ඉතා ශීඝ්‍රයෙන් ව්‍යාප්ත වන්නට විය. රූපයක් පටිගත කිරීම සම්බන්ධයෙන් වූ මානව කුතුහලය සහ සකලවිධ රූපමය අවශ්‍යතා සපුරා ගන්නට සමත් වූයෙන් යුරෝපීයයන් අත තිබූ ඡායාරූප ශිල්පය තමන් සතු කරගන්නට බොහෝ දෙනා උත්සුක විය. බටහිර රටවල් මෙන් ම ආසියාතික රටවල් ද මෙම ආකර්ෂණීය රූප නිමැවුම් ක්‍රමවේදය කෙරෙහි යොමු විය.

1 රූපය Photo Credit, Digital Collection at Harry Ransom Center, University of Texas, USA Joseph Nicéphore Niépce (French, 1765–1833), Untitled 'point de vue,' 1827. Heliograph on pewter, 16.7 x 20.3 x .15 cm. Gernsheim Collection, purchase, 964:0000:0001

ශ්‍රී ලංකාවේ දි පළමුවරට එලෙස කැමරාවකින් ඡායාරූපයක් ලබාගන්නා ලද්දේ ක්‍රි.ව. 1843 දි පමණ මෙරටට පැමිණි වතු පාලකයෙකු විසින් බව සඳහන් වන නමුත්, එය සනාථ කිරීම සඳහා මූලාශ්‍ර නොමැති බවත්, ශ්‍රී ලංකාවේ පළමු වරට රූගත කිරීම් සිදු කර ඇත්තේ F.J. Barrow නම් සුදු ජාතිකයා විසින් බවත්, ඔහු 1844 දි කොළඹ කොටුව බෙලි වීදියේ අංක 4 දරන ස්ථානයේ චිත්‍රාගාරයක් ආරම්භ කොට ඇති බවත්, ඔහු ලංකාවේ විවිධ ප්‍රදේශවල ඡායාරූපගත කිරීම් සිදුකර ඇති බවත් සඳහන් වේ. (ගුණසේකර, 2011.පි.4) එලෙස ආරම්භ වූ ශ්‍රී ලංකාවේ දේශීය ඡායාරූපකරණය වර්තමානය වන විට විවිධ තාක්ෂණික හා නිර්මාණාත්මක කලා මාධ්‍ය ඔස්සේ සැලකිය යුතු කාර්ය භාරයක් ඉටුකරන බව පැහැදිලිය. කාලීන හා ප්‍රවෘත්තිමය වටිනාකම් සහිත අවස්ථා, මානව චර්යාවන් හා සංස්කෘතිකාංග හා ස්වභාව දර්ශන, සංචාරක කර්මාන්තය, ආදිය සඳහා මෙන් ම පෞද්ගලික සිහිවටන ආදි විවිධාකාර ඡායාරූප නිමැවුම් සඳහා ද නිරන්තරයෙන් උපයෝගී කරගන්නා කලා මාධ්‍යයක් බවට පත් වී ඇත.

එකී ඡායාරූප ශ්‍රී ලංකාවේ කවර හෝ එකතුවකක ආරක්ෂා වී පවතී නම් ශ්‍රී ලංකාවේ සමාජ, ආර්ථික දේශපාලනික මෙන්ම කලා ඉතිහාසය පිළිබඳ පර්යේෂකයන්ට මෙන්ම ඒ පිළිබඳ උනන්දුවක් දක්වන බොහෝ පිරිසකට තම පර්යේෂණ සහ වැඩිදුර අධ්‍යයන සඳහා ඉහළ කරගත හැකි මූලාශ්‍ර මාධ්‍යයක් ලෙස එකී ඡායාරූපවලට ලැබෙනුයේ අසීමිත වටිනාකමකි. විශේෂයෙන් යටත් විජිත පාලන සමය පිළිබඳ දැනට අප සතුව සහ විදේශිකයන් විසින් ශ්‍රී ලංකාවේ සමාජ දේශපාලනික ඉතිහාසය සම්බන්ධයෙන් මෙවන විට සිදු කොට ඇති විවිධ අර්ථකථන එමගින් පුනර්වචනය කිරීමට ද අපට හැකියාවක් ලැබන බව නො අනුමානය. එසේ වුව ද, ඉන් බොහොමයක් අප වෙතින් ගිලිහී විදේශයන් වෙත ඇදි ගොස් ඇත. 1850, 60 දශකවල දී බ්‍රිතාන්‍ය ජාතික ඡායාරූප ශිල්පීන් විසින් ලක්දිව බොහෝ ස්ථාන ඡායාරූප ගත කර ඇති අතර, ඒවා බොහොමයක් විදේශ කෞතුකාගාර ගැලරි හා සංරක්ෂිත ග්‍රන්ථ තුළ පවතී. (Stambler, 2013) ඇයගේ විග්‍රහයට අනුව ශ්‍රී ලංකාවේ සුවිශේෂ අවස්ථා, සිද්ධි සහ සංස්කෘතිකමය අංග ඡායාරූපගත කරන ලද විදේශිකයන් අතර Frederick Fiebig, Joseph Lawton, Charles T. Scowen වැනි ඡායාරූප ශිල්පීන් ප්‍රමුබ වේ.

විජාතික ඡායාරූප ශිල්පීන්ගේ ආභාසය සහ ඔවුන්ගේ ව්‍යාවහාරික ඥානය ලද වංශවත් සිංහල ප්‍රභූන් කැමරාව තම සමාජ ස්ථරය සංකේතාත්මකව හුවා දැක්වීමේ ක්‍රමවේදයක් ලෙස උපයෝගී කරගන්නා ලද අතර ක්‍රමයෙන් මධ්‍යම පාන්තික ශ්‍රී ලාංකිකයන් අතරටත්, ඡායාරූප තාක්ෂණය දියුණු වීම හේතු කොටගෙන ඇති වූ කුඩා ප්‍රමාණ පටල පට හා කැමරා වෙළඳපොළට නිකුත් වීම හේතුවෙන් එය සාමාන්‍ය ජනතාව අතරටත් පත්වී වර්තමානය වන විට සාමාන්‍ය ජන ජීවිතයෙන් වෙන් කළ නොහැකි අංගයක් බවට පත් වී ඇති බව නවීන තාක්ෂණික මෙවලම් මෙන්ම ජංගම දුරකථන ඔස්සේ ද ඡායාරූපකරණයට ලැබී ඇති ප්‍රමුබතාව පිළිබඳ අධ්‍යයනය කිරීමේදී පැහැදිලි වේ. විශේෂයෙන්ම ජංගම මාධ්‍යකරණය සඳහා මෙකී දුරකථන ඡායාරූපකරණය මෙන්ම වීඩියෝ භාවිතය ද කදිම නිදසුනකි දෙරණ මාධ්‍ය ජාලය ඔස්සේ ජනප්‍රිය වී ඇති MOJO හෙවත් Mobile Journalism සඳහා ජංගම දුරකථන ආශ්‍රිත කැමරා භාවිතය මීට කදිම නිදසුනකි.

කෙසේ වුවද, ශ්‍රී ලාංකික සංස්කෘතිය තුළ උපතේ සිට මරණය දක්වා ඡායාරූපකරණයට විශේෂ ස්ථානයක් හිමිවන අවස්ථා බොහොමයක් නිර්මාණය වන්නට විය. පුද්ගල ජීවිතයේ වැදගත් යැයි සිතූ සෑම අවස්ථාවක් ම ඡායාරූපයට නැගීමටත් ඒවා මුද්‍රණය කර තබාගැනීමටත් උත්සුක විය. නිවසේ ආලින්දයේ මෙන්ම අමුත්තන්ගේ අවධානයට පාත්‍ර වන සෑම ස්ථානයකම පාහේ ඡායාරූප රාමු කර තබාගැනීම විශාල අස්වැසිල්ලක් ගෙන දුන්නා පමණක් නොව, එය තමාගේ සමාජ තත්ත්වය ආරක්ෂා කරගැනීමක් ලෙස ද පෞද්ගලික භාවිතයේ දී තම පසුම්බිය දැක්වාත්, මුද්‍රිත මාධ්‍ය හරහා සඟරා පුවත්පත් පිටුවලටත්, වාණිජ ප්‍රචාරණ අවශ්‍යතා මත දැන්වීම් නාම පුවරු මතත් ඡායාරූපය බහුල වශයෙන් පළ කෙරිණි. මෙවන් පුළුල් ඡායාරූප භාවිතයකට උරුමකම් කියන්නා වූ ශ්‍රී ලාංකිකයන්ගේ සංස්කෘතික වටිනාකම් හා ජන ජීවිතය හා සබැඳි ආලෝක සිත්තම් ආරක්ෂා කරගැනීම කෙරෙහි යොමු කර ඇති අවධානය අල්ප ය. ජන ජීවිතයේ බෙහෙවින් වැදගත් අවස්ථාවක් වන මංගල උත්සවය ඡායාරූප ශිල්පියාගේ අභිමතයට යටත් කරළීමට පෙළඹී ඇතත් ඔහු නිර්මාණය කරන වැදගත් සංස්කෘතික වටිනාකම් නියෝජනය කරන්නා වූ රූපමය එකතුව එනම් ඡායාරූප ගොනු (Album) ආරක්ෂා කර තම පරපුරට දායාද කිරීම පිළිබඳ යොමු කර ඇත්තේ අල්ප අවධානයකි. එබැවින් ශ්‍රී ලංකාවේ දේශපාලනික, ආර්ථික සහ සමාජ සංස්කෘතික ඉතිහාසය සහ විවිධ සංදිස්ථාන පිළිබඳ මනා වැටහීමක් ලබාගත හැකි

දේශීය ඡායාරූප එක්රැස් කිරීමේ සහ සංරක්ෂණය කිරීමේ ඇති වැදගත්කම පිළිබඳ අධ්‍යයනය කිරීම මෙම ලිපිය මගින් අපේක්ෂා කෙරේ.

ඡායාරූප සුරැකීමේ අවශ්‍යතාව

සංරක්ෂණය යනුවෙන් හැඳින්වෙන විෂය පථය ඉතා පුළුල් පරාසයක් ඔස්සේ අවධානයට පාත්‍රවන අතර මෙම අධ්‍යයනයේදී අවධානයට යොමුවන්නේ **ඡායාරූප සංරක්ෂණය කිරීම** සහ එය අන්තර්ගෘහිත වැදගත්කමකින් (Integrated Importance) (Raiford,2011.p.72) යුක්ත වන්නේ කෙසේද්‍යි යන්න පිළිබඳ සාකච්ඡා කිරීම සඳහාය. මෙහිදී වැදගත්වන කරුණක් වන්නේ ඡායාරූපයක් යනු සැමවිටම සිහිවටනයක් (memory) බවත් ඡායාරූපයක් සංරක්ෂණය කිරීමේදී එකී සිහිවටනයේ මූලික අරමුණ සහ ගුණාංගවලට හානියක් නොවන පරිදි එය සිදුකළ යුතු වීමයි. එනම් සංරක්ෂණය සඳහා යෝජිත ඡායාරූපයේ හෝ ඡායාරූප සමූහයේ මූල් අවශ්‍යතාව කුමක්ද යන්න මැනවින් අවබෝධ කරගත යුතු වීමයි. මෙහි දී **අවශ්‍යතාව** (necessity) යන්න මූලමය අර්ථයකට වඩා එහි අන්තර්ගත සමාජ සංස්කෘතික හා මානව විද්‍යාත්මක මෙන්ම භූගෝලීය හා පාරිසරික වශයෙන් පුළුල් ව අර්ථකථනය කරගත යුතුව ඇත (Palmquist, 2000, p.22). ඒ අනුව යමක් ගිලිහී යාම තුළ නැවත ප්‍රතිසාධනය කළ නොහැකි මට්ටමේ වටිනාකම් රැසක් අපට අහිමි වේ නම් එය ආරක්ෂා කරගැනීමට නිරන්තරයෙන්යෙන් අප අත්සුක විය යුතුය එසේ ම සංරක්ෂණ යනු ආරක්ෂා කිරීමට වඩා පුළුල් අර්ථයෙන් ක්‍රියාත්මක කළ යුතු අඛණ්ඩ ක්‍රියාදාමයක් බව ද මෙහි දී අවධාරණය කළ යුතු වේ.

ඒ අනුව ඡායාරූපයක් විසින් හසුරුවනු ලබන සහ එහි අන්තර්ගත වටිනාකම් (values) කවරේ ද යන්න පැහැදිලිව වටහාගැනීම සඳහා ඡායාරූප මාධ්‍ය ව්‍යවහාරය හා ශක්‍යතා පිළිබඳව අධ්‍යයනයට ලක් කළ යුත්‍ය. රූප ප්‍රතිනිර්මාණ ක්‍රමවේද අතර ඡායාරූපයට සුවිශේෂී ස්ථානයක් හිමි වන්නේ අන් කවර මාධ්‍යයකටත් වඩා තාත්වීකත්වය ග්‍රහණය කරගැනීමේ සහ ප්‍රතිනිර්මාණය කිරීමේ හැකියාව නිසා ය. තව ද ගෙවී යන කාලය අතරතුර මානව ක්‍රියාකාරකම් හා සමාජ පාරිසරික වටපිටාව තුළ ගතික සිදුවීම් මාලාවක මොහොතක් නිශ්චල කොට ඉදිරිපත් කිරීමේ හැකියාව ද, පියවි ඇසින් ග්‍රහණය කොට ගත නොහැකි නිමේෂයක් ඉදිරිපත් කිරීමේ හැකියාව ද ඡායාරූපකරණය සතු සුවිශේෂී ශක්‍යතාවන් වේ. රූප ග්‍රහණය කරගැනීමේ ක්‍රියාවලිය තුළ ඡායාරූප ශිල්පියාගේ සෘජු මැදිහත් වීමක් නොමැතිව කාචය හරහා පැමිණෙන ආලෝකය මගින් ආලෝක සංවේදී මතුපිටක් මත රූප ප්‍රතිනිර්මාණය සිදුවන බැවින් එය අදාළ අවස්ථා පිළිබඳ අව්‍යාජ නිරූපණයක් ලෙස පිළිගැනීමට ලක් වීම ද සුවිශේෂී කරුණකි. යම් සිදුවීමකට අදාළ ව නිර්මාණය වන ඡායාරූපයක් මගින් රූපරාමුවේ හතරමායිමට හසුවන සෑම ක්‍රියාකාරකමක ම හා ජීවී වස්තුවිෂයක ම එකී මොහොත නියෝජන කරනු ලබන අව්‍යාජ රූප ප්‍රතිනිෂ්පාදනයක් ඡායාරූපයකින් ඉදිරිපත් කළ හැකි ය. ඒ අනුව සමාජ සංස්කෘතික හා පාරිසරික වටිනාකම් පිළිබඳ වඩාත් තාත්වික හා අව්‍යාජ රූපමය වාර්තා සම්පාදනය සඳහා ඡායාරූපයට ඇති හැකියාව සුවිශේෂී වේ.

යම් වස්තුවිෂයක් හෝ වස්තුවිෂය සමභාරයක් ඡායාරූපයට නැගීමේ දී ඒ සඳහා උපයෝගිත ශිල්පීය ව්‍යාකරණ ඔස්සේ එනම් රූප කෝණය, නාභිය දුර, ආලෝක තත්ත්වය, රාමුගත කිරීම් ආදිය සමග සම්පිණ්ඩනය වීමෙන් එකී ඡායාරූප වාර්තාකරණය ඉක්මවා ගිය සුවිශේෂී ප්‍රකාශනාත්මක හා වින්දනාත්මක වටිනාකම් අත්පත් කොටගනී. එබැවින් ඡායාරූපයක් යනු යම්කිසි සමාජ සංස්කෘතික වටපිටාවක්

තුළ නිර්මාණය වන භාවාත්මක පෙළඹවීම් ඇති කරවනසුලු හෘදයාංගම ආමන්ත්‍රණයක් ද වේ. මානව සංස්කෘතික දිවිය තුළ පුද පිළිවෙත් සඳහා මෙන් ම උපයෝගීත්ව හා වින්දනය සඳහා නිර්මාණය කරගත් කලාත්මක වටිනාකමක් සහිත වස්තු විෂයයන් ඡායාරූපයට නැඟුණු අවස්ථා ද බහුලව දක්නට ඇත. (ගුණසේකර,පි. 67) මේවායෙන් ඇතැම් කලා නිර්මාණ කාලයත් සමග සඳහට ම අහිමි වී යන ඒවා ය. එවැනි සංස්කෘතික හා කලාත්මක වටිනාකමක් සහිත නිර්මාණ මතු පරපුර වෙනුවෙන් ආරක්ෂා කිරීම සඳහා සංරක්ෂිත මාධ්‍යක් වශයෙන් ඡායාරූපයට විශේෂ ස්ථානයක් හිමි වේ. මෙවන් වටිනාකම් සමුදායක් දරා සිටින ඡායාරූපය ඓතිහාසික උරුමයක් ලෙස අද්විතීය ස්ථානයක් හිමි කරගනියි.

ඡායාරූපීය මාධ්‍යය හා ඒවායේ රසායනික සංයුතිය

මුල් කාලයේ දී රූපගත කිරීම් සඳහා භාවිත වූයේ ආලෝක සංවේදී අඳුන් ගල්වන ලද ලෝහ තහඩු හෝ වීදුරුපත් ය. කල් යත් ම හෙන්රි ෆොක්ස් ටැල්බොට් විසින් සෘණඵලක ක්‍රමය හඳුන්වා දීමෙන් පසු රූපගත කිරීමට හා පිටපත් මුද්‍රණය සඳහා මුද්‍රණ කඩදාසි භාවිතයට පැමිණියේ ය. (Pollack, P, pp 74-84). 1889 දී ජෝර්ජ් ඊස්ට්මන් විසින් පටල පටය නිපදවීමත් සමග ඡායාරූපකරණයට සෙලියුලොයිඩ් නයිට්‍රේට් පටල භාවිත වූ අතර, පසුව ඇසිටේට් පටල හා පොලියෙස්ටර් පටල ද භාවිතයට පැමිණියේ ය. (Read and Mayer, p 15) පොදුවේ ගත් කල ඡායාරූපීය මාධ්‍යයේ සැකැස්ම ප්‍රධාන කොටස් දෙකකට වෙන්කර හඳුනාගත හැකි ය. එනම් කැමරාවට යොදා රූපගත කිරීමට භාවිත කරන සෘණඵලක හා මුද්‍රණ ලබාගැනීමට භාවිතා කරනු ලබන මුද්‍රණ මාධ්‍යය යි. මෙම සෑම ඡායාරූපීය මාධ්‍යයක ම ප්‍රධාන ස්ථර දෙකක් හඳුනාගත හැකි ය. එනම් ආලෝක සංවේදී අඳුන සහ ආධාරකය යි ("Information Leaflet on the Care, Handling, and Storage of Photographs-Collections Care-Resources |Preservation | Library of Congress)''
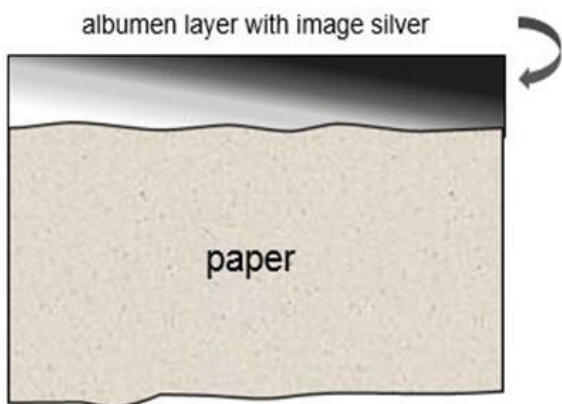
2 රූපය ඇල්බියුමින් මුද්‍රණයක හරස්කඩ
Canadian Conservation Institute,
CCI 129982-0003

,

මෙහි කඩදාසි මත ඇල්බියුමින් වැනි බන්ධන මාධ්‍යයක් සමග රිදී ලවණ ගල්වා ඇත.

මෙම ස්ථර දෙකෙහි රසායනික සංයුතිය එකිනෙකට වෙනස් වන අතර, ඒවායේ භෞතික ගති ලක්ෂණ ද එකිනෙකට වෙනස් වේ. උෂ්ණත්වය වෙනස්වීම හා ආර්ද්‍රතාවේ වෙනස්වීම් වැනි පාරිසරික සාධකවලට දිගුකාලීන ව නිරාවරණය වීමෙන් ඒවායේ ඇති විය හැකි විපර්යාසයන් ද එකිනෙකට වෙනස් වේ. මෙකී හේතුව නිසා ම

ඡායාරූපීය මාධ්‍ය සාමාන්‍ය පරිසර තත්ත්වයක දී රසායනික පරිහානියට ලක් වීමේ අවදානම ද වැඩි ය.

විශේෂයෙන් කළුසුදු රූපයක පිළිබිඹුව සකස් වන්නේ ලෝහ රිදී අංශුවලින් බැවින් එම පිළිබිඹු දිගු කලක් වෙනස් නොවී ආරක්ෂා වී තිබෙන බව පොදුවේ පවතින මත ය. එ නමුත් එකී රිදී පිළිබිඹුවේ පැවැත්ම ලෝහ තරම් ස්ථාවර නොවන කඩදාසි ආධාරකය, ජෙලටින් ස්ථරය ආදිය මත රඳා පවතී. කඩදාසි යනු පහසුවෙන් දිරාපත් වීමට හා වෙනත් පරිහානියනට ලක් විය හැකි මාධ්‍යයකි. ජෙලටින් යනු ජෛවීය පටක ආශ්‍රිත නිපැයුමක් හෙයින් නිරන්තරයෙන් ක්ෂුද්‍ර ජීවීන්ගේ බලපෑම්වලට ද ලක්විය හැකි ය. එසේ ම එය අධික තෙතමනය හමුවේ මොළොක් ඇලෙනසුළු ස්වභාවයකට පත් වේ. එ බැවින් සියලු ම ඡායාරූපීය මාධ්‍ය එනම් පටල පට සහ මුද්‍රණ කඩදාසි මත නිමැවූ ඡායාරූප මෙන් ම වර්ණ කළුසුදු ආදි භේදයකින් තොරව මෙකී මාධ්‍යවලට ආවේණික පරිහානියට ගොදුරුවීම වීමේ අවදානම පවතියි. මෙම ආවේණික පරිහානිය දෙයාකාර වන අතර එය රසායනික හා යාන්ත්‍රික පරිහානිය වශයෙන් හා හඳුන්වනු ලැබේ. මෙම රසායනික හා යාන්ත්‍රික පරිහානියට අමතරව විවිධ හේතු නිසා ඇතිවිය හැකි භෞතික පරිහානි තත්ත්වයන්ට ද ඡායාරූපයක් ගොදුරු වේ. තව ද ජෛවීය පරිහානියට ද ලක්වීමේ අවදානම පවතී. ඡායාරූප මුද්‍රණ සඳහා භාවිත මාධ්‍ය විවිධ අමුද්‍රව්‍ය එනම් කඩදාසි, ලෝහ, වීදුරු, ප්ලාස්ටික් වැනි මාධ්‍ය ආධාරක ලෙස උපයෝගී කරගෙන නිපදවා ඇති අතර, ඉන් බහුලව භාවිත වන මාධ්‍යය වනුයේ කඩදාසි සහ ප්ලාස්ටික් වේ. කඩදාසි මත ගල්වන ලද අදුන් වර්ග ගණනාවක් ඇති අතර, ඒවායේ ස්වභාවය ද එකිනෙකට වෙනස් වේ. ඡායාරූපයක් නිමවීමේ දී භාවිත කරනු ලබන දුව්‍ය පහේද දෙකකි.

කඩදාසි පදනම සහිත ඡායාරූපීය දුව්‍ය (Paper-based photographic Material

- ලවණ මුද්‍රණ කඩදාසි (1840-1855)
  (Salted paper prints (1840–1855)

- වැක්ස් කඩදාසි සෘණඵලක (1840-1855)
  (Waxed paper negative (1840–1855)

- කැලෝටයිප් කඩදාසි-සෘණඵලක (1842-1851)
  (Calotype (1842–1851)

- ඇල්බියුමන් මුද්‍රණ කඩදාසි (1850-1910)
  (Albumen prints (1850–1910)

- කොලෝඩියෝ-ක්ලෝරයිඩ් මුද්‍රණ කඩදාසි (1890-1910)
  (Collodio-chloride prints (1890–1910)

රිදී ජෙලටින්, මුද්‍රණ කඩදාසි / කොඩැක් චිත්‍රාගාර සෞදපත් (1880 - 1990)
  (Silver gelatin, printing-out papers / Kodak Studio Proof
  (1880s–1990s)

ප්ලාස්ටික් පදනම සහිත ඡායාරූපීය ද්‍රව්‍ය (Plastic-based photographic Material)

- සෙලියුලෝස් නයිට්‍රේට් කළුසුදු සෘණඑළක (1889-1951)

    (Cellulose nitrate black and white negatives (1889–1951)

- සෙලියුලෝස් ඩයිඇසිටේට් කළුසුදු සෘණඑළක (1909-1940)

    (Cellulose diacetate black and white negatives (1909–1940)

- සෙලියුලෝස් ට්‍රයිඇසිටේට් කළුසුදු සහ වර්ණ සෘණඑළක (1935 - සිට)

    (Cellulose triacetate black and white and colour negatives   (1935–
                present)

- පොලියෙස්ටර් කළු සහ සුදු සහ වර්ණ සෘණඑළක (1942 - සිට)

    (Polyester black and white and colour negatives (1942–
    present)

- ඇසිටේට් වර්ණදේහ විනිවිදක පටලපට (1930 - සිට)

    Acetate chromogenic transparency film (1930s–present)

                (Source: Canadian Conservation Institute)

ඡායාරූප හානිවීම

නිවැරදි ක්‍රමවේද යටතේ මනාව පැසුරුම් ක්‍රියාවලියට ලක් කර නිමවන ලද කළු සුදු රිදී ජෙලටින් මුද්‍රණයක් සාමාන්‍ය පරිසර තත්ත්වයක් යටතේ වඩාත් ස්ථාවර ව පවතී. කඩදාසිවල පවතින අහිතකර අපද්‍රව්‍ය හේතුවෙන් ඡායාරූපට හානි සිදුවිය හැකි බව පෙර සිට ම හඳුනාගෙන තිබූ බැවින් ඡායාරූප සඳහා භාවිත මුද්‍රණ කඩදාසි ඉතා පිරිසිදු ඉහළ ගුණ ගුණාත්මක බවකින් නිෂ්පාදනය කිරීමට අදාළ සමාගම් සමත් වී ඇත. පිළිබිඹුව සකස් වීමට දායක වන ලෝහ රිදී ඔක්සිකාරක මාධ්‍ය නොපවතින විට දී ස්ථායි බවින් යුක්ත ය. ජෙලටින් ස්තරය හා බැරිටා ස්ථරය සාපේක්ෂ වශයෙන් රසායනිකක ව නිෂ්ක්‍රිය ද්‍රව්‍ය වේ. ඒ අනුව දිගුකාලිනව ඡායාරූපයක් නිරුජ්දිතව ආරක්ෂා කරගැනීම සඳහා අවශ්‍යයෙන් ම සපයා දිය යුතු සාධකය ස්ථාවර පාරිසරික තත්වය යි. එනම් පිරිසුදු වාතාශ්‍රයක් සහිත නිර්දේශිත අඩු උෂ්ණත්ව මට්ටම හා සාපේක්ෂ ආර්ද්‍රතා මට්ටම පවත්වා ගැනීමයි. අවාසනාවට මෙන් අපට සපුරා ගත නොහැකි වන්නේ ද මෙකී අත්‍යාවශ්‍ය සාධකය ම ය.

ඒ අනුව සාමාන්‍ය පාරිසරක තත්ත්වයක් යටතේ පවතින සෑම ඡායාරූපයක් ම යම් තරමකින් හෝ පරිහානියට ලක්වීම වැළැක්විය නොහැකි ය. ඡායාරූප සංරක්ෂණය කෙරෙහි විශේෂ අවධානය යොමු කරමින් විශේෂ ක්‍රියා පිළිවෙතක් අනුගමනය කළ යුත්තේ එබැවිනි. බහුලව දක්නට ලැබෙන ස්වභාවයෙන් ම සිදුවිය හැකි හානි එනම් රසායනික හා යාන්ත්‍රික පරිහානි අවස්ථා කිහිපයක් හඳුනාගත හැකි අතර ඒවා පහත පරිදි වේ.

   රිදී පරිහානිය   - Image Silve Deterioration

   පටල දාරක පරිහානිය   - Film Base Deterioration

වර්ණ ඡායාරූපවල සායම් වියැකීම	- Color Photographic Dye Fading
රෙසින් ආලේපිත කඩදාසි ඉරිතැලීම්	- Resin Coated Paper Cracking

වර්ණ ගන්වන ලද හා පුනර්ස්පර්ශ වියැකීම හා ගිලිහීයාම :Hand Coloring and Retouching, Fading and Loss)

රිදී පරිහානිය

රිදී පරිහානියේ දී සිදුවන්නේ පිළිබිඹුවේ පවතින ලෝහ රිදී ඔක්සිකරණය වී රිදී අයන බවට පත්ව ජේලටින් ස්තරය හරහා සංක්‍රමණය වී විසිරීමට ලක්වීම යි. ඉලෙක්ට්‍රෝන අන්වීක්ෂයකින් බැලූ විට මෙම විපර්යාසයට ලක් වූ රිදී අවතැන්වීම හොඳින් නිරීක්ෂණය වනු ඇත. ඔක්සිකරණය වූ රිදී අයන බවට පත් වී සෑම දිශාවකටම විහිදී ඇති අතර, මධ්‍යයෙහි තද කළු රිදී කැටිති දක්නට ඇත (3 රූපය). ඉහතින් සඳහන් කරන ලද රිදී පරිහානිය ඔක්සිකරණය වීමට අමතරව වායුගෝලීය හා පාරිසරික තත්ත්වය මත විවිධ රසායනික ප්‍රතික්‍රියාවනට ලක්ව පිළිබිඹුව වියැකීම හෝ අවපැහැ වීම දිලිසීමට බඳුන් වීම ආදී විපර්යාසයනට ලක්වීමට පුළුවන.
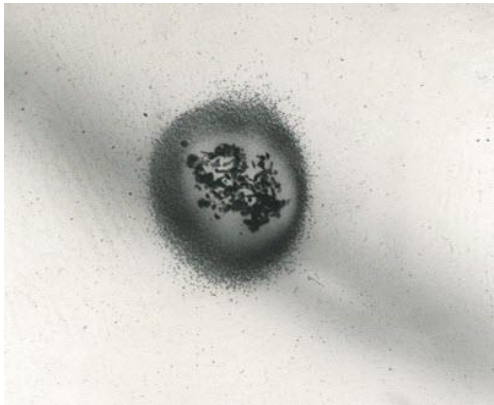
3 රූපය. Canadian Conservation Institute. CCI129982-015

දාරක පරිහානිය

ඡායාරූපගත කිරීමට භාවිතා වූ පටලපට නිපදවීම සඳහා ප්ලාස්ටික් අමුද්‍රව්‍ය වර්ග තුනක් භාවිත විය. එනම් සෙලියුලොයිඩ් නයිට්‍රෙට් කැකකමකදසා හසඑර්එ්‍රැ පටල,සෙලියුලොයිඩ් ඇසිටේට් කැකකමකදසා ්ජසඑ්එ්‍රැ පටල හා පොලියෙස්ටර් ්ජදකහිඑ්‍රැ පටල යන අමුද්‍රව්‍ය යි. 1889 දී ඇසිටේට් පටල හඳුන්වා දෙනු ලැබුවේ කොඩැක් සමාගම විසිනි. නමුත් මුල් කාලයේ දී එකී අමුද්‍රව්‍ය නිසි ප්‍රමිතියකට අනුව නිෂ්පාදන නොවූ හෙයින් විශාල පරාසයක ගැටලු ඇතිවිය. ඇතැම් ඒවා පරිහානියට ලක් වූ අතර ඇතැම් ඒවා හොඳින් පැවතිනි. 1920 න් පසුව ඇසිටේට් පටල හඳුන්වා දීමත් සමග ම නයට්‍රෙට් පටල භාවිතයෙන් ඉවතට ගියේ ය. නවසිය පනහේ දී පමණ වදකහිඑ්‍රැ සෙකප භාවිතයට පැමිණියේ ය. මෙම අමුද්‍රව්‍ය බොහෝ මිල අධික වූ හෙයින් සියට සීයක්ම ඇසිටේට් පටල ඉවතට දමා මෙම විකල්පයට මාධ්‍ය භාවිතය අසීරු විය.

මුල් කාලයේ භාවිතයේ වූ සෙලියුලොයිඩ් නයිට්‍රෙට් පටලය ර්ට ආවේණික රසායනික අස්ථායී ස්වභාවයෙන් යුක්ත මාධ්‍යයකි. එය වැඩි උෂ්ණත්වය හා ඉහළ ආර්ද්‍රතාව හමුවේ ඉක්මනින් දිරාපත් වීමට ලක් වේ. එමෙන් ම මෙම මාධ්‍ය වහා ගිනි ඇවිලෙනසුළු ය. ඒකරාශී කොට තැනීමේ දී ස්වයං දහනයට පවා ලක්වීමේ අවදානම ඇත. කෙසේ වෙතත් ආර්ද්‍රතාව හා උෂ්ණත්වය නිසි පරිදි කළමනාකරණය

නොකරන්නේ නම් ක්‍රමයෙන් දිරාපත් වීම ආරම්භ වී පටලය සම්පූර්ණයෙන්ම දිරාපත්වී දුඹුරු පැහැ කුඩු ගොඩක් ලෙස දිස් වේ.

සෙලියුලොයිඩ් ඇසිටේට් පටල ද ආවේණික රසායනික අස්ථායී බවින් යුක්ත ය. අයහපත් පාරිසරික තත්ත්වයක දී එහි ඇති සුවිකාරකය (ශ්කීඑස්ජස්ʹඋර) වාෂ්පීකරණයට ලක්ව පටල ධාරකය හැකිලීමට ලක් වන අතර, පටල අදුනේ බුබුලු ඇති වී බිඳී යාමට ලක් වේ. එමෙන් ම උෂ්ණත්වය හා ආර්ද්‍රතාව හේතුවෙන් කල් යත්ම අණුක බන්ධන ඉහිල් වී ඇසිටික් අම්ලය විමෝචනය වීමට පටන් ගනී මෙම තත්ත්වය තුළ දී එකී පටල වෙතින් විනාකිරි දුර්ගන්ධය හැමීම සිදුවෙන අතර, එබැවින් මෙම දිරාපත් වීමේ අවස්ථාව Viniger Syndrome ලෙස හඳුන්වනු ලබයි (Read and Mayer pp 15-16).

වර්ණ විෂැකීම

බොහෝ වර්ණ ඡායාරූප සඳහා භාවිත වර්ණක අස්ථාවර ස්වභාවයෙන් යුක්ත වේ. ඡායාරූප සඳහා බහුලව භාවිත වූ වර්ණ ක්‍රමය වන්නේ වර්ණ උත්පාදක ජයරඳපඳටැබසජ ක්‍රමය යි. මෙම වර්ගයේ ඡායාරූප බොහෝ සෙයින් ආලෝකයට නිරාවරණය වීමෙන් එහි වර්ණ විෂැකී යාම ආරම්භ වේ. මෙහි වඩාත් අවාසි සහගත තත්ත්වය වන්නේ අඳුරේ දී ද සායම් විෂැකී යාම සිදුවීම යි. ඊට හේතුව අඳුරේ දී වුව උෂ්ණත්වය ඉහළ මට්ටමක පැවතීම යි. විවිධ වර්ණ සඳහා භාවිත වර්ණක රසායනය අනුව මෙහි විෂැකීම් තත්ත්වය විවිධාකාර වන අතර, විෂැකීමට සාපේක්ෂව ඡායාරූපය කහ, සයැන් හෝ මැජෙන්ටා පැහැ ගැනීමට පුළුවන.

රෙසින් ආලේපිත කඩදාසි ඉරිතැලීම

මුල් කාලයේ නිපදවූ රෙසින් ආලේපිත වර්ණ හා කළු සුදු කඩදාසි යන දෙවර්ගය ම මෙකී පරිහාණියට ගොදුරු වනු දක්නට ඇත. මෙම තත්ත්වයේ දී සිදුවන්නේ කඩදාසි හා අදන අතර ඇති පොලිඑතිලීන් ස්ථරයේ දැඩි ඉරිතැලීම් ස්වභාවයක් පෙන්නුම් කිරීමයි. ඡායාරූපයට සුපිරිසිදු සුදු පැහැයක් එක්කිරීම සඳහා මෙම රෙසින් ස්ථරයට ටයිටේනියම් ඩයොක්සයිඩ් එක්කර ඇත. මුද්‍රණය මතුපිට ආලෝකය පතිත වීම නිසා ඇතිවන රසායනික ප්‍රතික්‍රියාවක් හේතුවෙන් මෙසේ රෙසින් ස්ථරය පලුදු වීම සිදුවේ.

වර්ණ ගන්වන ලද හා පුනර්ස්පර්ශ හානි වීම.

වර්ණ ඡායාරූප තාක්ෂණය බිහිවීමට ප්‍රථම වර්ණ ඡායාරූප සකසා ගන්නා ලද්දේ කළු-සුදු ඡායාරූප මත උචිත පරිදි වර්ණාලේප ගැල්වීමෙනි. මෙම පරිහානි තත්ත්වයේ දී සිදුවන්නේ එසේ ගල්වන ලද වර්ණ මුළුමනින් ම ඉවත් වී යාම හෝ විෂැකී යාම යි. මෙකී හානිකර තත්ත්වයට භාවිත කරන ලද වර්ණවල ගුණාත්මක භාවය හා මුද්‍රණවල තත්ත්වය ද බෙහෙවින් බලපවත්වයි. විශේෂයෙන් ම පුද්ගල ආලේඛ්‍ය රූපවල කම්මුල් හුවා දැක්වීමට වැඩි වශයෙන් තීන්ත භාවිතයත් ස්වර්ණාහරණ වැනි දේ සඳහා භාවිත රන්වන් පැහැය මෙසේ අධික ලෙස ගැලවී යාම සිදු වේ . මෙම පරිහානි තත්ත්වයට ද බෙහෙවින් බලපානු ලබන්නේ ඉහළ ආර්ද්‍රතාවය හා අධික උෂ්ණත්වය යි.

දුබල මවුන්ට් ක්‍රමවේද හා ආලේපන භාවිතයෙන් වන හානි

මුල් කාලීන ව ඡායාරූප මුදුන් කිරීම සඳහා භාවිත වූයේ වියළි මුදුන්ට් ක්‍රමය යි. එ නමුත් මෙම ක්‍රමය දිගු දිගුකාලීනව ඡායාරූප ආරක්ෂා කිරීම සඳහා නිර්දේශිත ක්‍රමයක් නොවන්නේ මුදුන්ට් සඳහා භාවිත මුදුන්ට් ටිෂු කඩදාසිවල හා ඇලවුම් කාරකවල අහිතකර රසායනික ද්‍රව්‍ය පැවතීම යි. එ මෙන් ම ඇලවීමේ දී සිදුකරනු ලබන රත් කිරීම් ඡායාරූපයට හානිකර ප්‍රතිඵල අත්කර දේ. විශේෂයෙන් ම වෙළඳපොළේ ඇති ඡායාරූප මුදුන්ට් කිරීම සඳහා ඇති ඇලවුම්කාර ද්‍රව්‍යවල අම්ලකාර දිගුකාලීන ව ඡායාරූප මත රැඳී තිබීමෙන් ඒ සමග ප්‍රතික්‍රියා කර ඡායාරූපයට හානි ගෙන දෙනු ලබයි.

එමෙන් ම ඡායාරූපය ආරක්ෂාවට හා නිමාව සඳහා ඡායාරූප මතුපිටට යොදනු ලබන ආලේපන එනම් සැලැක්, වැක්ස් වර්ග, සෙලියුලොයිඩ් නයිට්‍රේට් ආදිය හේතුවෙන් පිළිබිඹුව ට හානිකර ප්‍රතිඵල ගෙන දීමට පුළුවන. ඡායාරූප මතුපිට ආරක්ෂක ස්තර ලෙස භාවිත වන ආලේපන ආලෝකයට නැතහොත් හිරු එළියට නිරාවරණය වීමෙන් අවපැහැ ගැන්වීමට ද ලක් වේ. බොහෝ ලැමිනේට් වර්ග ද ඡායාරූපයට හානිකර වන අතර, ඒවා ගලවා ඉවත් කිරීම ද අතිශය අසීරු කාර්යයකි.

මීට අමතරව ඡායාරූප වලට හානි විය හැකි තවත් පරිබාහිර අවස්ථා කිහිපයක් හඳුනාගත හැකිය. එනම් ආගන්තුක ද්‍රව්‍යවලින් සිදුවිය හැකි භෞතික හානි, ස්වභාවික උපදුව අවස්ථාවල දී සිදුවිය හැකි හානි මෙන් ම ජෛවීය හානි ආදිය යි. :ස්ඵව* ඡායාරූප නිසි ආකාරයෙන් නඩත්තු නොකරන අවස්ථාවල දී මෙන් ම ආරක්ෂාකාරී ලෙස පරිහරණය නොවන අවස්ථාවල දී ආගන්තුක ද්‍රව්‍යවලින් ඡායාරූපවලට විවිධ හානි ඇති විය හැකි ය. විශේෂයෙන් ම පරිසරයට නිරාවරණය වී තිබෙන විට දී කුණු දුහුවිලි අපද්‍රව්‍ය දිගු කාලීනව ඡායාරූපය මත තැන්පත් වීමෙන් ඡායාරූපයට හානිවිය හැකි ය. එසේ ම නිවැරදි නොවන ආකාරයට ඡායාරූප තැන්පත් කිරීමෙන් ද මෙකී හානි එනම් අදුන් ගැලවී යාම, ඡායාරූපයේ අදුන පැලුඩුවීම හා කඩදාසිය ඉරි යාම ආදිය යි.

ඡායාරූප සංරක්ෂණ උපාය මාර්ග

ඡායාරූපයක් සංරක්ෂණය යනු හානිවීමේ වේගය අවම කරමින් බාහිර උපදුවලින් තොර ව අනාගත පරපුර වෙනුවෙන් දීර්ඝ කාලයක් එය ආරක්ෂිතව තබාගැනීම යි. ඡායාරූපයක් මෙසේ ආරක්ෂා කිරීමට නම් මූලික වශයෙන් එම නිර්මාණය සඳහා ගුණාත්මක බවින් උසස් අමුද්‍රව්‍ය භාවිත කර තිබිය යුතු සේ ම, නිවැරදි ක්‍රමවේද හා ක්‍රියා පිළිවෙත් අනුගමනය කරමින් පැසුරුම් කර නිමවා තිබිය යුතු ය. එසේ නිමවන ලද ඡායාරූපයක් සංරක්ෂණය කිරීම සඳහා අනුගමනය කළ යුතු ක්‍රියාපිළිවෙත් හා උපායමාර්ග කිහිපයකි.

තැන්පතු ක්‍රමවේදය	Storage System
උෂ්ණත්වය හා ආර්ද්‍රතාව පාලනය	Temperature and Related Humidity
නිවැරදි පරිහරණය	Handling
ප්‍රතිකර්ම හා ප්‍රතිස්ථාපනය	Repair and Restoration

තැන්පතු ක්‍රමවේදය

ඡායාරූපීය මාධ්‍ය සංරක්ෂණයේ දී නිවැරදි තැන්පතු ක්‍රමවේද සහ බහලු භාවිතය අතිශයින් ම වැදගත් කරුණකි. සංරක්ෂණය සඳහා ම විශේෂයෙන් සැකසූ

සංරක්ෂණ රාක්කය නිපදවා ඇත. මෙහි දී තවත් සැලකිය යුතු කරුණක් වන්නේ ඡායාරූප සංරක්ෂණය දී භාවිත කරන බහලු සහ කවර භාවිතය යි. නිසි ප්‍රමිතියෙන් තොර කවර බහලු භාවිත කිරීමෙන් ඡායාරූපය සාමාන්‍ය පරිදි තැන්පත් කරනවාටත් වඩා හානිකර තත්ත්වයන්ට ගොදුරු වීමට පුළුවන. විශේෂයෙන් ම සංරක්ෂණ සඳහා නිර්දේශිත බහාලු සහ මවුන්ට් වර්ග භාවිතය අනිවාර්ය වේ. ඡායාරූප සංරක්ෂණය සඳහා භාවිත කළ යුතු මාධ්‍ය පිළිබඳව සැහීමකට පත්වීමට පෙර එකී මාධ්‍ය ඡායාරූප ක්‍රියාකාරකම් පරීක්ෂණයට (Photography Activity Test/ PAT භාජනය කළ යුතු වේ. (Image permanence Institute) මෙහි දී කඩදාසියෙන් තැනූ Four Fold Envilop හතරවටින් නවන කවර භාවිතා කරනු ලැබේ. මෙම කවර ඡායාරූපයට හානි නොකරන ආකාරයේ විශේෂ කඩදාසිවලින් සකස් වූවකි. මෙහි ඇති අවාසි සහගත තත්ත්ය වනුයේ ඡායාරූප නිරීක්ෂණය කිරීමට නම් කවරය විවෘත කර බැලිය යුතු වීම යි. එබැවින් එම අවාසිදායක තත්ත්වය අවම කරමින් නිපදවා ඇති විනිවිද පෙනෙන කවර බහාලු භාවිත කරනු ලැබේ. ඒවා පොලිඑතිලීන් පොලිප්‍රොපයිලීන් වැනි ද්‍රව්‍යවලින් නිපදවා ඇත.

මුද්‍රිත ඡායාරූප ඉහත සඳහන් කරන ලද ආරක්ෂිත බහාලුම්වල තැන්පත් කර රාක්කවල තිරස්ව තැන්පත් කරනු ලබ යි. මෙසේ තැන්පත් කිරීමෙන් ඡායාරූපවල තලිය ස්වභාවය ආරක්ෂා වේ. සෘණ ඵලක ද ඉහත ආකාරයේ ආරක්ෂිත කවරවල තැන්පත් කර සිරස්ව ගබඩා කිරීම කළ යුතු ය. සිරස්ව ගබඩා කිරීමෙන් අඳුන පලුදු වීමකින් හෝ දාරකය හානි වීමකින් තොරව දිගු කාලීනව ආරක්ෂාකාරී ව තබාගැනීමට හැකියාව ලැබේ.

උෂ්ණත්වය සහ ආර්ද්‍රතාව

සංරක්ෂණ කාර්යයේ දී උෂ්ණත්වය සහ ආර්ද්‍රතාව බෙහෙවින් තීරණාත්මක සාධක වේ. ඡායාරූප මාධ්‍ය ගබඩා කර ඇති සංරක්ෂණාගාරයක් තුළ උෂ්ණත්වය සහ සාපේක්ෂ ආර්ද්‍රතාව පහළම මට්ටමක පවත්වාගත යුතු අතර ම, එය ඉහළ පහළ යා නොදී නිරන්තරයෙන් ස්ථාවර මට්ටමක පවත්වා ගැනීම ද අනිවාර්ය වේ. උෂ්ණත්වය වැඩි වන විට දී රසායනික ප්‍රතික්‍රියා වේගය වැඩි වන අතර ම ඡායාරූප හානි වීම ද සිදු වේ. එසේ ම ඉහළ ජල වාෂ්ප ප්‍රමාණයක් වායුගෝලයේ ඇති තිබීම ද ඡායාරූප හානි වීමට හේතුවකි. එසේ ම අඩු ආර්ද්‍රතාවක් පැවතීම නිසා ඡායාරූප ධාරකය වියළි හැකිළීමට ලක්වීම මගින් හානි වීමට පුළුවන. එබැවින් සාපේක්ෂ ආර්ද්‍රතාව සහ උෂ්ණත්වය නිර්දේශිත මට්ටමට පවත්වාගැනීම බෙහෙවින් වැදගත් කරුණකි.

නිවැරදි පරිහරණය

සංරක්ෂණ කාර්ය අතරතුර දී ඡායාරූප හා සෘණ ඵලක පරිහරණය කිරීමේ දී බෙහෙවින් කල්පනාකාරී විය යුතු අතර, ඒ සඳහා නිවැරදි ක්‍රමවේද අනුගමනය කළ යුතු ය. ඡායාරූපීය මාධ්‍ය පරිහරණයේ දී සෑම විට ම සංරක්ෂණ කපු අත්වැසුම් Cotton Glows හෝ නයිට්‍රයිල් රබර් අත් වැසුම් Nitrile Rubber Glows පරිහරණය කළ යුතු ය. සෘණ ඵලක මෙන් ම මුද්‍රිත ඡායාරූප පරිහරණයේ දී ආධාරකයක් මත තබා ඒවා පරිහරණය කළ යුතු ය. එකී ආධාරක සංරක්ෂණ කටයුතු සඳහා නිර්දේශිත අමුද්‍රව්‍ය වීම අනිවාර්ය වේ. සංරක්ෂිත ඡායාරූපීය මාධ්‍ය ඉතා පැරණි ඒවා බැවින් ආධාරක රහිතව පරිහරණය කිරීමෙන් පහසුවෙන් කැඩී බිඳී යාමට ඉඩකඩ ඇත. එ බැවින් මාධ්‍ය පරිහරණයේ දී ඒවායේ ආරක්ෂාව සඳහා ගතහැකි සෑම පියවරක් ම අනුගමනය කළ යුතු වේ.

ඡායාරූප පිළිසකර කිරීම හා ප්‍රතිෂ්ඨාපනය

ඡායාරූප ප්‍රතිෂ්ඨාපනය ඡායාරූප සංරක්ෂණයට අදාළ විශේෂ ප්‍රාගුණ්‍යයක් සහිත වෘත්තිය තත්ත්වයක් මෙන් ම මැනවින් ප්‍රගුණ කළ යුතු විෂය ක්ෂේත්‍රයකි. ඡායාරූප පිළිසකර කිරීමේ නිරතවන සංරක්ෂකයෙකු ඉතා ඉවසිලිවන්තව සහ ඥානවන්තව කටයුතු කළ යුතු වේ. විශේෂයෙන් ම ඡායාරූප ප්‍රතිෂ්ඨාපන කටයුතුවල නිරතවීමේ දී සංරක්ෂකවරයාගේ නිර්මාණාත්මක හැකියාව ද බෙහෙවින් ප්‍රයෝජනවත් වේ.

සාමාන්‍යයෙන් සංරක්ෂණාගාරයට ඡායාරූපයක් ලැබුණු පසු එය සංරක්ෂණ කුටිවලට යොමු කිරීමට පෙර අවශ්‍ය පිළිසකර කිරීම් කරනු ලැබේ. සංරක්ෂණාගාරය තුළ හානි වූ හා හානි වීමට ඉඩකඩ ඇති ඡායාරූප පළිසකර කිරීම් කළ යුතු ය. ඡායාරූප පිළිසකර කිරීමේ දී සරල ක්‍රියාකාරකම් සිට අතිශය සියුම් සංකීර්ණ ක්‍රියාකාරකම් දක්වා වූ කාර්යභාරයක් පවතී. (Photographic Materials Group)

ඡායාරූප පිළිසකර කිරීමට අදාළ සරල ක්‍රියාකාරකම්.

- මතුපිට පිරිසිදු කිරීම.
- ඉරුණු ඡායාරූප පිළිසකර කිරීම්
- බිඳුනු දාරකය පිළිසකර කිරීම්
- ඡායාරූප පැතලි කිරීම්.
- අදුන පිළිසකර කිරීම්.

(Source: The Sesion of the Photographic Conservation by Dawn Jeros (Head of Library Conservation at the Academy of Motion Picture Arts and Sciences, Margaret Herrick Library) at Film Preservation and Restoration Workshop in India, 8-15 September 2017)

ප්‍රතිෂ්ඨාපනය යනු හානි වූ ඡායාරූපයක් එහි මුල් ස්වරූපයට ගෙන ඒම සඳහා අනුගමනය කරනු ලබන ක්‍රියා පිළිවෙත යි. එහි දී ඉහතින් අප සඳහන් කරන ලද පිරළිසකර කිරීම ඇතුළ ව දිගුකාලීන හා නිර්මාණාත්මක ක්‍රියාකාරකම් ඊට ඇතුළත් වේ. අංකිත ක්‍රමයට මෙම ඡායාරූප ප්‍රතිෂ්ඨාපනය කිරීමේ දී මෘදුකාංග භාවිත කර ඉතා පහසුවෙන් හා කාර්යක්ෂමව මෙම කාර්යය ඉටු කරගැනීම සඳහා පහසුකම් ඇත. එනමුත් ඡායාරූප සංරක්ෂණයේ දී ප්‍රමුඛතාව ලබාදෙනුයේ මුල් පිටපත් එසේත් නැතහොත් ඡායාරූපය ඡායාරූපය ආකාරයට ම සංරක්ෂණය කිරීමට ය.

සමාලෝචනය

ඡායාරූපීය මාධ්‍ය සතු විශේෂතා පිළිබඳවත්, යම් ජන සමාජයක් තුළ නිර්මාණය වූ ඡායාරූපයක් දරා සිටින වටිනාකම් කවරේ ද යන්න පිළිබඳවත්, එය අනාගත පරපුර උදෙසා ආරක්ෂා කළ යුතු උරුමයක් බවත් සංරක්ෂණ ක්‍රියාදාමයේදී මූලික වශයෙන් අවධානය යොමුකළ යුතු කාරණයකි. ඡායාරූප මාධ්‍යවලට සිදුවන හානි සහ ඊට අදාළ හේතු කාරක පිළිබඳ අවබෝධයක් ලබා තිබුණ ද, සංරක්ෂණය සඳහා අවශ්‍ය ක්‍රියාමාර්ග, පිළිවෙත් පිළිබඳ නිසි අවබෝධයකින් තොරව සංරක්ෂණය කිරීමේදී එහි මූලික ගුණාංග ආරක්ෂා කර ගැනීමට නොහැකි වනවා මෙන්ම ඉතා ඉක්මනින් විනාශ මුඛයට ගොදුරු වීම ද සිදු වේ. ශ්‍රී ලංකාව සම්බන්ධයෙන් වන

ඡායාරූප උරුමය සංරක්ෂණය සඳහා විධිමත් මෙන් ම අඛණ්ඩ ජාතික වැඩ වැඩපිළිවෙළක් අවශ්‍ය වන්නේ එබැවිනි.

ශ්‍රී ලාංකේය සන්දර්භය තුළ නිර්මිත ඡායාරූප අතීත උරුමයක් ලෙස අවධානය යොමු කරන විට, එම උරුමය රාජ්‍ය මට්ටමේ සිට පෞද්ගලික ගෘහස්ථ මට්ටම දක්වා පුළුල් පරාසයක විහිදී පවතී. අතීත උරුමය සම්බන්ධයෙන් භෞතික නිමැයුම් ආරක්ෂා කිරීම සඳහා 1940 අංක 9 හා 1998 අංක 24 දරණ පුරාවිද්‍යා අඥාපනත, 1988 අංක 73 දරණ සංස්කෘතික දේපල පනත වැනි අණපනත් සම්පාදනය මඟින් ප්‍රතිපාදන සකසා ඇති අතර, ඒ සඳහා යම් පෙළඹවීමක් ද සමාජය තුළ ස්ථාපනය වී ඇත. නමුත් ඡායාරූපවල සුරක්ෂිත භාවය පිළිබඳව එවන් නෛතික ප්‍රතිපාදන පිළිබඳ අවධානය යොමුකිරීම හෝ සමාජයීය පෙළඹවීම අවම මට්ටමක පවතින බව පෙනෙන්නට තිබේ. ශ්‍රී ලංකාව සර්ම කලාපීය රටක් බැවින් සාපේක්ෂ වශයෙන් රටේ බොහෝ ප්‍රදේශවල වැඩි උෂ්ණත්වයක් පවතින අතර ම ආර්ද්‍රතාව ඉහළ මට්ටමක පවති යි. එහෙයින් සාමාන්‍ය පාරිසරික තත්ත්වයක දී සංරක්ෂණය සඳහා අවශ්‍ය සාධක සපයා දීම අසීරු කරුණකි.

සංරක්ෂණාගාරයක් සඳහා පවත්වාගත යුතු පාරිසරික තත්ත්වය එනම් උෂ්ණත්වය සහ සාපේක්ෂ ආර්ද්‍රතා මට්ටම විකල්ප තුනක් යටතේ නිර්දේශ කර ඇත.

Temperature RH From BS ISO 18934: 2006 Imaging materials – Multiple media – Storage environment		
Vault type	Temperature	RH/Related Humidity
Subzero	-20°C – 0°C	30–50%
Cold	0°C – 8°C	30–50%
Cool	8°C – 16°C	30–50%
Room	16°C – 23°C	30–50%

(Clark, 2019. p.10)

ඉහත සඳහන් පරිදි නිර්දේශිත තත්ත්වයන් පවත්වා ගනිමින් නඩත්තු කිරීම වෘත්තීය හෝ ආයතනික මට්ටමේ සංරක්ෂණාගාරයකට කළ හැකි නමුත් ඉන් මෙපිට දී එය එතරම් ප්‍රායෝගික නොවේ. නමුත් සාමාන්‍ය කෞතුකාගාර පරිසරයකට උචිත සම්මත අනුව 21°C උෂ්ණත්වයක් සහ 50% සාපේක්ෂ ආර්ද්‍රතා මට්ටමක් පවත්වා ගත යුතු ය. ඉහත නිර්දේශ අනුගමනය කළ නොහැකි අයෙකුට ඡායාරූපය සංරක්ෂණ ය අවම මට්ටමින් හෝ පවත්වා ගැනීමේ අවකාශය ද පවතී.

මෙහි දී විශේෂයෙන් ඡායාරූප සංරක්ෂයකු විසින් සැලකිය යුතු කරුණක් වන්නේ ආලෝක තත්වයන් සෘජුව හෝ පරාවර්තිත හිරුඑළියට නිරාවරණය වීම මඟින් ඡායාරූප හායනයට ලක්වන බව මූලික වශයෙන් අවබෝධ කරගැනීමයි. එසේ ම ප්‍රතිදීපන පහන් හෝ ටංස්ටන් පහන් වැනි අනාරක්ෂිත ආලෝක ප්‍රභව ද ඡායාරූපවලට හානිකර වේ. එයට හේතුව මේ සියලු ආලෝක ප්‍රභවවලින් සැලකිය යුතු ප්‍රමාණයක අති දම් (Ultra Violet) කිරණ විමෝච්වනය වන බැවිනි. එබැවින් ආලෝක ප්‍රභව සඳහා අතිදම් අවශෝෂක පෙරණ යෙදීමත් ඡායාරූප මත අති දම් ආරක්ෂක ආවරණ යෙදීමත් මෙයට පිළියම් වේ. (Wagner et al.2020)

ඡායාරූප මතුපිට ආරක්ෂා කිරීම සඳහා විවිධ ආලේපන ගැල්වීම ඡායාරූපයට අහිතකර බව ඉහත දී සාකච්ඡා කළ ද මී ඉටි එනම් මීමැස්සා වදය සෑදීමට ගන්නා මාධ්‍ය ඡායාරූප මත ගැල්වීමෙන් ඡායාරූප අඳුන ආරක්ෂා වන අතරම එය ඡායාරූපයට හානිකර නොවන බව රසායනිකව සහතික කර ඇති බව පිළිගෙන ඇත.

(Source: Canadian Conservation Institute). ඉහළ ආර්දතා මට්ටමක් ඇති රටක් වශයෙන් ශ්‍රී ලංකාව තුළ ඡායාරූපවල ජේලටින් ස්ථරයට ඇතිවිය හැකි හානි අවම කිරීම සඳහා මෙම විකල්පය භාවිත කළ හැකි ය.

තත්ත්වය එසේ වී මුත් අවම මට්ටමේ පාරිසරිකයක් වුව ද සාමාන්‍ය ගෘහස්ථ පරිසරයක් තුළ දී පවත්වා ගැනීම එතරම් පහසු කාර්යයක් නොවේ. ඡායාරූපයක් ආරක්ෂා කිරීම, සංරක්ෂණය කිරීම සඳහා ඉහතින් සඳහන් කරන ලද කිසිත් කළ නොහැකි නම් තමන් ජීවත් වන වටපිටාව තුළ ඡායාරූපයට ලබාදිය හැකි උපරිම ආරක්ෂාව සහ සැලකීම ලබා දී එය හැකිතාක් දුරට ආරක්ෂා කිරීම වැදගත් වේ. එමගින් ඡායාරූපය යනු අනාගත පරපුර වෙනුවෙන් සුරැකිය යුතු උරුමයක් ය යන්න සමාජගත වනවා මෙන්ම ඡායාරූප සංරක්ෂණයෙහි දී මූලික මූලධර්මයක් වශයෙන් එය ඉතා වැදගත් සාධකයක් ද වනු ඇත.

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Challenges and Opportunities of adapting to mLearning During Lockdown: A Study on Selected Secondary School Students in SriLanka

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Abstract

It was the recommendation of the world bodies such as UNESCO to shift to open and distance learning (ODL) to fight with the effects of COVID-19 on education which left millions of the school children worldwide away from school. Thus, it was inevitable for Sri Lankan educational context to shift the conventional classroom setting into an ODL platform with the use of Mobile Learning Environments (MLE) and Social Network Services (SNS). This exploratory study was conducted using a mixed- method approach to discover the challenges and opportunities of using synchronous mobile and SNS-based MLE to continue the education process during the lockdown, with the participation of 105 secondary school students. Data collection was done using a Google form-based survey along with the interview with teachers for comments and feedbacks while adhering to the FRAME model by Koole (2009) as the theoretical model. According to the findings, some students were unable to meet uninterrupted infrastructure requirements needed to set up an MLE as they have used shared devices (mostly their parents'). Issues on high internet charges, slow mobile internet, unavailability of reloading facility were experienced during lockdown while literacy of mobile and online technology was a challenging factor for some other. Besides, it was revealed that the duration of the mobile classes, as well as the periods used for classes, have a high impact on the students learning process. Students' comments revealed that the long screen time together with abrupt changes in the schedule makes thestudent more stressful while they expect the classes to be more interactive to prevent the possibility ofbeing easily distracted. With the suggestions from the local scholars to embrace the opportunity given by the pandemic, further research is needed with a sample representing each part of the country and also to find the most effective pedagogy for mLearning in Sri Lankan context.

Keywords: *lockdown; COVID-19; mLearning; school students; challenges; opportunities*

Introduction

The sudden burst of COVID-19 and its quick spread into a global pandemic has changed the way of things and forced to adapt to New Normal with the introduction of concepts such as Lockdown and Social Distancing. According to UNESCO estimates (2020a; 2020b), covering 180 countries and territories, it is projected that about 24 million students, including care centres, colleges, universities and other training institutions, of which 10.9 million are at the primary and secondary level, will be at risk of not returning to educational institutions by 2020. South and West Asia (5.9 million) and sub- Saharan Africa (5.3 million) account for the largest proportion of learners at risk of not returning to school. According to UNESCO, students living in poverty and marginalization are hardest hit, as well as those impacted by conflict and migration.

The COVID-19 pandemic also triggered an extensive, unexpected and dramatic digital leap in the basiceducation of children which demanded significant changes not only from children and their teachers butalso from their families, the administration of schools and society as a whole. Children and their families who unexpectedly had to have a range of talents, skills and resources were also significantly burdened (Iivari et al., 2020). Unfortunately, the digital divide was massive in the new normalcy for several groups of students. According to a study with Ghanaian students (Owusu-Fordjour et al., 2020), it came to light that the pandemic has had a negative impact on their learning, as many of them are not used to learning effectively on their own. It was due to the restricted internet connectivity and lack of literacy on the technical devices by most Ghanaian students. Therefore, the eLearning platforms were rolled out and challenged most of the students.

As Toquero (2020) has reported, educational institutions, especially in the Philippines, face increasing challenges in their planning, implementation and evaluation systems. The global pandemic, however, opened up opportunities for the country to upgrade its delivery mode of education and change its focus to emerging technology on a light note. Furthermore, Cao et al. (2020) concluded in a study in China that about 24.9 per cent of college students have developed anxiety due to the outbreak of COVID-19.Living in urban areas, living with parents, having a stable family income were protective factors for college students against experienced anxiety during the COVID-19 outbreak.

In a study in Guyana, Oyedotun (2020) says that in some developing countries where the education sector has been significantly

affected by the pandemic, the COVID-19 arrived unexpectedly with little to no initial plan in place. In the case of Guyana, online education, which has become the new standard,courtesy of COVID-19, is currently facing various types of challenges. Some of which are categorized as slower internet speed at home due to sudden and unprecedented internet traffic, lack of sufficient prior training for both students and lecturers on the requirements of online teaching and various types of violations and exposure.

Impact of COVID-19 in Sri Lankan School Education

The global pandemic crippled the education sector, mainly the school education sector because most of the universities have adhered to blended learning and the students have an exposure to online education using the Learning Management System (LMS) in the respective university. Sri Lankan schools had been shut from March but re-opened two weeks ago after authorities said they had contained the spread of the virus. However, at the moment with a new cluster reported, the governmentdecided to shut schools form forth October 2020 further to the earlier two occasions in March and Julyas a precautionary measure.

In the Sri Lankan context, Kadirgamar & Thiruvarangan (2020) argues that online teaching excludes students who do not have a sound economic background to purchase the necessary equipment to connect with their peers and teachers. As they express, there is a concern about electricity and undisrupted internet connectivity as well as to have a learning environment within their homes that is free of disturbance from other members of their families. Kadirgamar & Thiruvarangan (2020) further suggest the importance of taking steps to eliminate the cost for both students and teachers by providingequipment and connectivity. In the least, the shift to online education should not lead to aggravating theinequalities already entrenched in our educational settings.

Objectives of the Study

This study intends to find out the opportunities and the challenges faced by secondary school students of the selected sample to adapt to eLearning for the continuation of the educational activities during thetime of lockdown, using the following research questions.

- To what extent do the available mobile devices, tools and software act as the infrastructure forlearning for the students?
- Up to which level do they have sufficient mobile literacy to

manipulate with the mobile learningenvironments (MLEs)?

- What are the socio-economical restrictions and encouraging factors for the students to engagewith learning activities in MLE?

Literature Review

Kukulska-Hulme & Traxler (2005) predicted a decade and a half ago that mobile learning has the potential to challenge traditional teaching and learning practice. They further elaborated that mobile learning can take education back to the home, workplace and community, while mobile learning can be spontaneous, portable, intimate, situated; it can also be informal, unobtrusive, ubiquitous. Besides, Kukulska-Hulme & Traxler clarified that it brings us much closer to learning anywhere, but they assumed that it was still too early to predict how our mobile learning and teaching understandings are understood. At that time, they were intended to evolve mobile learning principles and provide a collection of reflections and experiences to be transmitted from a generation of mobile learning researchers, developers and teachers to, hopefully, the next generation. It seems that this is an era, due to the COVID-19 pandemic, where their expectation and efforts effectively adapted to the education process.

Zaharah et al. (2020) stated that eLearning brings change and creativity to Indonesian education because during the COVID-19 epidemic, nearly 75 per cent of students engaged in online learning simultaneously. However, there are many barriers to the introduction of learning tools, such as internet networks are not met, students are not used to them, teachers and even parents work or research by online learning at home. According to them, this is a natural occurrence, because using the MLE has not become a routine for students and teachers. However, it is a method to be familiar with in the future as that could yield better results in learning.

The findings of a study conducted in India (Joshi et al., 2020) show that significant challenges were barriers faced by students in home environments, a lack of necessary facilities, external distraction andfamily disturbance during teaching and performing tests. Institutional support barriers, such as the budget for the procurement of advanced technologies, a lack of planning, a lack of technical support and a lack of clarity and guidance, also affected the method. Teachers were also faced with technical issues. Those problems were categorized as a lack of technological support, including a lack of technical infrastructure, low awareness of online teaching platforms and security issues. Problems such as negative attitudes and lack of motivation are described as variables that

hinder their participation inonline teaching and assessments.

The need to train students for a world in which digital literacy plays a significant role has also been recognized in Germany. König et al. (2020) suggested that digitalization has recently gained popularity in schools, and is used to close the gap between traditional learning by students and school progress towards the knowledge economy. Therefore, the school curriculum needs to be increasingly interconnected with ICT, and opportunities to use modern technology tools and digital resources shouldbe provided to students.

Oyinloye (2020) stresses that new teaching and learning methods are currently being implemented by many educational institutions worldwide as different digital online platforms are being adopted to replace the traditional classroom as schools are closed due to COVID-19. The findings of her study suggest that COVID-19 would have a negative effect on Nigeria's education system. Most schools in Nigeria lack eLearning facilities to enable teachers to connect with their students at such a time that even the few schools and children have issues with power supply, which makes most students are unable to access the eLearning facilities.

Despite high expectations, as Sahlberg (2020) said, there is only a slight possibility that schools can improve as a result of this pandemic without bold and courageous changes in attitude about how that change occurs. The COVID-19 pandemic has exacerbated the consequences of prior social and educational inequality, and a significant outcome of the pandemic will be to address these. Learning at home has always been focused on the old logic of absorbing information and knowledge during school closures, rather than generating or co-creating new ideas and solutions to real-life issues.

According to Iivari et al. (2020), teachers in a Finnish public school reported that they used Google Classroom, an online learning environment, often for five years before the lockdown. Luckily, therefore the case was not a giant leap either for the kids or for the teacher. The teachers say that for all of the pupils, technology was not a concern or an obstacle. For those who did not have them at home, the school borrowed equipment, such as laptops. In the beginning, though, skills may have been a bit of anobstacle for them.

Theoretical Framework

Framework for the Rational Analysis of Mobile Education (FRAME) by Marguerite L. Koole (2009) is used as the theoretical framework of this

research. As shown in **Figure 1**, the Device Aspect (D) refersto the physical, technical, and functional characteristics of a mobile device such as size, weight, keyboard type, screen size. At the same time, the Learner Aspect (L) takes into account an individual's cognitive abilities, memory, prior knowledge, emotions, and possible motivations such as cognitive structure, active knowledge, self-questioning where the Social Aspect (S) takes into account the processes of social interaction and cooperation such as social constraints, quality of the relationship between peers and teacher. While the device usability intersection (DL) in the model describes the relationship between one learner and a device, the Social Technologies intersection (DS) describes how mobile devices enable communication and collaboration amongst multiple individuals and systems. The Interaction Learning intersection (LS) represents a synthesis of learning and instructional theories but relies very heavily upon the philosophy of social constructivism.
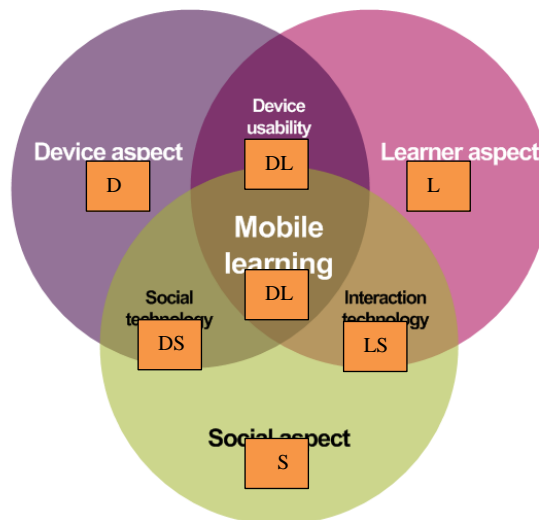

Figure 1: The FRAME model

Effective mobile learning (DLS) is the primary intersection results from the integration of the device (D),learner (L), and social (S) aspects. According to Koole (2009), effective mobile learning provides enhanced collaboration among learners, access to information, and a deeper contextualization of learning. Theoretically, effective mobile learning can empower learners by enabling them to assess better and select relevant information, redefine their goals, and reconsider their understanding of concepts within a shifting and growing frame of reference (the

information context). Effective mobile learning provides an enhanced cognitive environment in which distance learners can interact with their instructors, their course materials, their physical and virtual environments, and each other.

Methodology

This study was conducted as a case study during the lockdown period of the first wave of COVID-19 in Sri Lanka. Due to the condition of the country during the lockdown, the only possible way of contact was phone calls, social networking apps (SNA) and other communication apps such as Zoom and Teams. Therefore, this study was conducted entirely using the communication tools mentioned above. Anonymity was guaranteed to make the sample more comfortable, by not requesting any of their contact information which was yield positive aspects concerning the analysis of their comments which will be discussed in results.

Research Design and Sample

This research was conducted in an exploratory research approach due to the lack of research conducted in the Sri Lankan context in the area. A convenience sample with the participation of 105 secondary school students representing Western, Central and Sabaragamuwa districts according to the availability of access. Communications with the teachers were done through short interviews via phone calls and WhatsApp due to the prevailing lockdown measures throughout the country at the time of conducting the survey.

Data Collection and Analysis

This study adopts both qualitative and quantitative data gathered via an online survey to determine the extent to which technology is used in the learning process by the selected students during the lockdown. Also, the motivational and restrictive factors towards the mobile learning process were considered too. The survey consists of 14 closed-ended questions which include, multiple-choice questions and Likert scales and a comment section, which prompt for a long answer. However, the comments section was not compulsory. Besides, interviews were conducted amongst teachers to understand the behaviour and the attendance of the students during the synchronous online sessions and SNA-based teaching environments. In addition to the automated analyzer provided with Google forms, analytical software was used to generate tabulated data.

Results and Discussion

Availability of mobile devices, tools, and software a r e to be used for the implementation of the infrastructure for the mobile learning environment.

According to a survey of mobile usage in Sri Lanka by LIRNEasia, only 34 per cent of households in SriLanka with children under the age of 18 had an Internet connection in 2018, as stated in the Sri LankaEducation Forum (Gamage & De Mel, 2020). More than 90 per cent of these links are accessed via a smartphone over mobile networks, mainly due to the economic factors. Subsequently, the most feasibleoption for the majority of students was to access the mobile learning sessions using the existing devicesand tools as the lockdown state in the country mostly discouraged the purchase of new devices mostlydue to the economic factors as well as there was a shortage of devices due to the halt of imports during the lockdown period. According to the survey, majority of the students use their home computer (41%) for online education. Among others, 11.4 per cent use parents' computer, 32.4 per cent use the mobile phone of their parents while the rest uses other forms of devices such as tabs where the median falls into the category of using parents' computer (**Figure 2**). Concerning the type of internet connection they used for the online educational purpose, there are 44 students (41.9 %) with a postpaid home broadband connection which has the highest value for prepaid home broadband connection (25.7 %), prepaid mobile internet (20 %), and postpaid mobile internet (17.1 %) connections as shown in **Figure 2.**

According to that information, 43.8 per cent of students depend on their parents' digital device as the infrastructure of the MLE where there are inconveniences of participation synchronous online session in case their parents are in essential service such as health services and forced to work outside home during the pandemic. Though the percentage of those cases are not high, that is a factor that needs to be considered too. Also, further communication with the students and teachers revealed that there are problems with the availability of infrastructure when there is two or more student in the same house, sharing the only available digital device. As one student emphasizes, "If there are two three children do they cannot go online through one phone/computer", and another raised the issue as "Any problem with the hardware makes it difficult during the COVID time to repair".
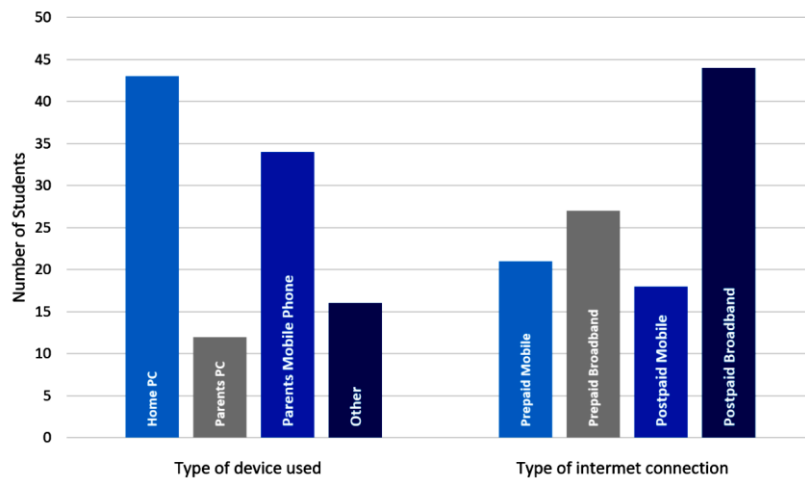
Figure 2: Usage of mobile devices and internet connection

Software for the mobile learning were mostly free software and mobile apps, WhatsApp and Viber mostly, or the basic free versions of applications such as Zoom. Some school has the aces to Google Classroom or Microsoft Teams where they offered that privileges for their students. Survey and interviews with the teachers confirmed that there were no issues related to software unless the denial of support of particular software due to the lack of hardware requirements of the digital devices of some students which were settled through accommodating a previous version of the software or app. Therefore, concerning the information from the sample, it is evident that they have sufficient digital tools and software to be used as the infrastructure for their MLE. Hence, as depicted by the FRAME model of Koole (2009), there is a positive sign on the device aspect where the available digital devices can be utilized for the infrastructure of the MLE.

Level of existing mobile literacy to manipulate with the mobile learning environment.

According to the information from Department of Census and Statistics Sri Lanka (Computer Literacy Statistics, 2019), the computer and digital literacy of the school student in the secondary level is 42.2 per cent and 54.7 per cent respectively. Responses of the sample also revealed a correlation towards those data where the gap between computer and mobile literacy is the same though the literacy rated are higher than those statics. Reason for higher literacy rates might be due to the sample size.

There are 79.1 per cent of students with computer literacy higher than average, and the value of that for mobile literacy is 88.5 per cent. **Figure 3** shows a comparison of those data. According to the information from the sample, the median of both computer and mobile literacy falls in 'Very Good' out of five Likert scale values from 'Excellent' to 'Poor'.

Moreover, there was no comment from the students or teachers on the lack of literacy on mobile learning. It shows that even the ones with 'Fair' or 'Poor' literacy on technology have managed to manipulate with the MLE. Therefore, it is agreeable with the recent comment of De Mel (2020) that, "Our students are bright and yes, we boast of a high literacy. But never do we use that foundation to make our kids world-class."
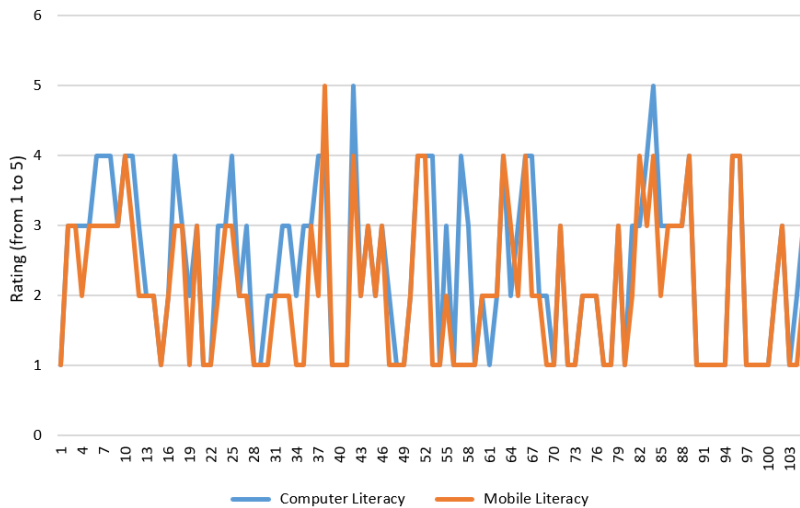

Figure 3: Computer and mobile literacy of the sample

Restrictive and encouraging factors for the students to engage with learning activities in a mobile learning environment.

The sudden shift to MLE for the continuation of the learning process created numerous opportunities as well as challenges towards the learners. For most of the learners, the most common issues were the time slots and the duration of the lessons. With the responses from the sample, **Figure 4** shows the preference of the students on the study time and durations. It shows that the students prefer to adhere to their default learning slot which falls in the morning session as majority prefer the time slot from 8 am to 12 pm (47.4 %) and the least preferred time slots are between 12 pm to 4 pm and 4 pm to 8 pm (7.6 % each) while there is an

equal but low preference over early morning and late evening time slots with 19 % and 18.1 % respectively. Concerning the duration of lessons, most preferred were 2 and 4 hours which had the same preference rate of 30.5 per cent. For 5 hours and 6 hours, the rating decreased to 4.8 % and 16 %. Therefore, it is a positive factor to assign classes in the morning sessions and make sure the durations of those lessons are not falling beyond four hours.
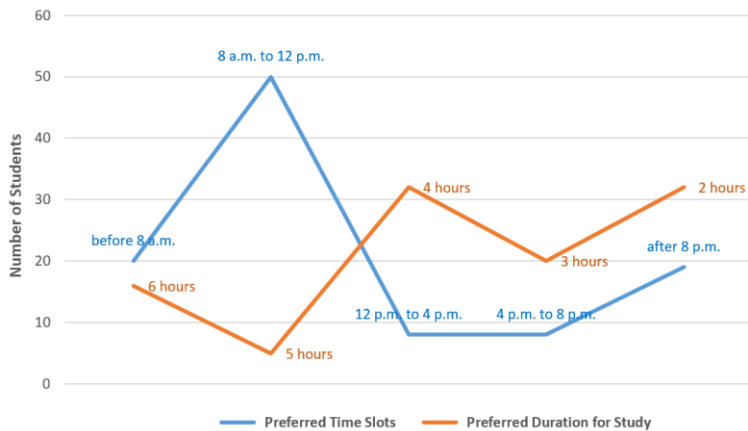

Figure 4: Preference over the study slots and duration

Moreover, there is a need to consider the students' preference over the MLE. As shown in **Figure 5**, students' preference over the mode of delivery and overall preference in mobile learning, it seems that the majority prefer to have live sessions (80 %). However, due to the network-related issues in both delivering and receiving ends, it was not always a possibility. According to the comments of the teachers, participations for synchronous online lessons were relatively low. Therefore, though the students have preference over live classes, with the prevailing condition, it was not a success most of the time where the teachers shifted to SNA-based asynchronous methods. In addition to that, around 24 per cent from the sample are either not much preferred or dislike the MLE. Discussions with those students show that it was due to the monotonous nature of the delivery of lessons as well as the high screen time where some students complained about eye strain and weariness. According to the comments of the students. one stated that "...and I got eyes very weak, just because of staring at the phone for hours."
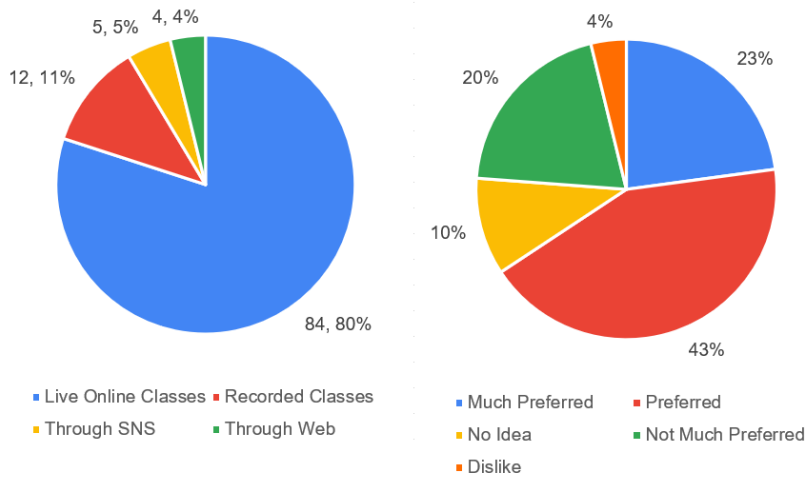
Figure 5: Preference over the mode of delivery and working with the mobile learning environment

Another major drawback was the internet speed and charges. As depicted in **Figure 6**, the majority of the students encountered issues with slow internet. Technically, with the increase of the usage of the mobile internet, respective service providing terminals starts to be overflowed with requests which made it impossible to cater to a new request to use those terminals. According to the sample, around 59 per cent of the students experienced slow internet, and the situation was worse when the teachers also experience at the delivering end. Also, high internet charges as the free quota of data quickly exceeded make the teachers shift the approach from online to SNA-based instructions to minimize the data usage. However, at the time of composing this article, most of the leading telecommunication providers has introduced low-cost alternatives for Zoom or Teams based teaching-learning environments. Unavailability of reloads or reload cards during the lockdown was another major drawback. At the time where the second wave has locked down several areas of the country, that issue is still there but not as much experienced in the first wave because the telecommunication providers have introduced additional ways to top-up mobile connections.

Moreover, there was the issue of the inability of finding resources such as mobile phones or computers to access MLEs where a student commented that when there are two-three children, they cannot go online through one phone/computer as most of the time online classes are scheduled to suit the school time, from 8 am to 2 pm. As students

emphasized, abrupt changes in the schedules, as well as the clashes in the timetable, makes the student stress. Therefore, special consideration should be drawn on that aspect too.
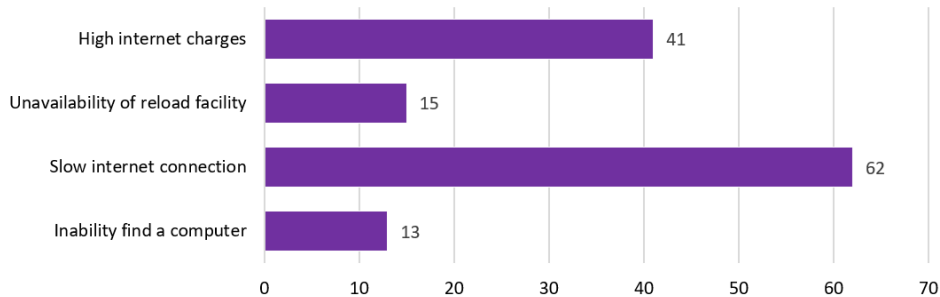

Figure 6: Drawbacks and restrictionsfaced bystudents**.**

Limitations and Implication for Further Studies

As the study was conducted with the use of a convenience sample with a small sample size from a population close to 4,037,157 students of 10,012 public schools all around the island, there is a necessity of working with sufficient sample size with at least district or province base study to generalize the findings. Hence, the assistance of the respective authorities is sought after to expand this study further. Furthermore, there is a necessity to survey the form of printed forms where the students have no access to equipment or internet to have a broad and a clear view of the actual state of the feasibility of implementing nationwide mobile learning environment. Finding the feasibility of LMS based learning platform would be useful as the students can work with it without time constraint using uploaded content. Furthermore, there is a necessity to research about the appropriate pedagogy that can be synchronized with the eLearning as most students have suggested that they expect the way of delivery to be changed to engage them more in the mobile learning process.

Conclusion and Recommendations

Though there are complexities created by the economic stability, shortage of stocks due to lockdown inpurchasing devices, according to the information from the sample, it is evident that available digital devices, tools, software and apps with the students can be used to set up the infrastructure for the MLE. However, there is a problem with 24X7 availability of the devices as 43.8 per cent from the sample use parents' computer or mobile phone while there are instances of sharing the only

available device with several siblings. The suggestion of Kadirgamar & Thiruvarangan (2020) to take steps to eliminate the cost for both students and teachers by providing the equipment and connectivity at a nominal rate would be a perfect move. As Owusu-Fordjour et al. (2020) suggested concerning the Ghanaian context, there is a need for the students to expose more towards the tools used to manipulate with the eLearning platforms and how to use them effectively for educational practice in Sri Lankan context too to improve the mobile literacy and narrow the gap of the digital divide. While agreeing with statement of Zaharah et al. (2020) that eLearning learning brings change and creativity to education during the COVID-19 epidemic, Sri Lankan students also expect innovative ways to make the students attached to the lessons. As one student suggests, "teachers should find a way to make the online class a bit more interesting so that children must not fall asleep during these classes children should feel involved otherwise they are more likely to be bored." This statement urges the need to concern more about the learner aspect illustrated in the FRAME model by Koole (2009) such as motivation. However, the social aspect needs to study more extensively as the lockdown state lead the students to be in a digital environment.

Besides, there must be a concern about the finding the most effective time for the students to participate and avoid abrupt changes on the schedule which could have clashed with either the students' or their siblings' learning schedules. It is evident as Toquero (2020) emphasize majority of educational institutes has faced increasing challenges in their planning, implementation and evaluation systems, mainly due to the lack of knowledge about the pedagogy and digital literacy. Furthermore, it is necessary to educate both the administrators and the teachers on how to use the MLE effectively to make the students more engaged and interested. The global pandemic, however, has given the opportunities for the policymakers in the country to upgrade its delivery mode of education and switch their focus to available emerging technology which can scaffold the learning process. Finally, adhering to the statement of De Mel (2020), provided our students are smart and have a high degree of literacy compared to the other students in the region, it is evident that the proper time has come to welcome the opportunity offered by eLearning platform, eliminate challenges and embrace to the opportunities to produce more knowledgeable and skilled intellectuals.

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Hieroglyphics rituals performed at *Pandam Dolaha* (Twelve Torches) *Shanthikarma*

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Abstract

This research focuses on highlighting the fact that the sign marked by *Kapu Mahatha* (Main practitioner) ,who is possessed in *Pandam Dolaha Shanthikarma*, an inherent ritual of Sathkorale, is also a current practice of the ancient hieroglyphics rituals. This research was carried out by analyzing data based on documentary evidences on ancient hieroglyphic rituals, participant observations on *Pandam Dolaha Shanthikarma*, and correlational studies. Hieroglyphic rituals mean the application of hieroglyphs, which belong or do not belong to a certain language, specifically for the purpose of a ritual. Such hieroglyphs are found even in the darkest corners of caves, to which the accesses is very difficult, and the Anthropologists are of the view that they have been written in those places for the purpose of a ritual. It is observed that such hieroglyphics are used at present for different rituals. *Pandam Dolaha Shanthikarma,* a ritual practiced in Sathkorale, which is performed with the aim of prosperity, healing and protection, is a ritual devoted to God *Paththini*. During this ritual, twelve *Pandams* are offered to the god and it is observed that these hieroglyphs are marked at the second part of the ritual conducted to ensure protection for houses and lands and in the healing process. During this ritual, the blessed Kapumaththaya (Practitioner) enters in his possession all the rooms of the house spreading resin on a burning *pandama* and marks a certain sign by his *pandama* on the wall above the door frame, when he leaves the room. These signs are made on the walls above all doors of rooms and the main entrance to the house. Even though certain differences can be identified among these signs, in the meantime a similarity can also be found in such signs. This ritual is not performed at the houses and *Devalas*, which are dealing with inhuman forces. It is observed the practice of marking these hieroglyphs is followed with the intension of removing demonic forces and further making barriers for such forces. Since these hieroglyphs are marked by the possessed person, folks believe that it is protection

assured by God through the signs of God. Accordingly, a conclusion can be made that the hieroglyphs made in the possession at *Pandam Dolaha Shanthikarma* represent an evolution of the ancient hieroglyphic rituals followed by the ancient people lived in caves with the expectation of getting a protection from invisible forces.

Key Words- *Sathkoralaya, Pandam Dolaha, Possession, Hieroglyphics rituals*

Introduction

All the creations, which were made physically or conceptually by the human society in its historical journey, represent exclusively the real needs of such society. The human, who was always in the thirst for a comfortable life, tried constantly to find easy ways for achievement of such comforts, and accordingly it has resulted in building updated knowledge in the process and it consists of physical as well as metaphysical knowledge. The most controversial part of the human history is the metaphysical knowledge and the concepts connected to it. Even today, a large number of researches are made on the metaphysical knowledge, which covers the beliefs, rituals connected to the ancient human's religious inclinations.

Pandam Dolaha Shanthikarma, on which our research is carried out, is a *Deva Shanthikarma* or *Madu Shanthikarma* practiced centering North Western Province. This *Shanthikarma* is practiced at *Devalas* and houses with a view to ensure the protection of gods, prosperity and healing based on worshiping Goddess Paththini. During the ritual a *pooja* consists of twelve *pandams* is conducted for Goddess *Paththini* and these *pandams* are offered to the name of Goddess by the possessed *Kapumahaththya*. Then *pandams* are delivered among the participants of the ritual and they are kept on the pandal by these persons. In the meantime a specific custom is followed to assure the protection of the house. The possessed *Kapumahaththya* enters the house holding these twelve *pandams* and he comes out of the house after spreading resin on the burning *pandams* in every room and then he draw a sign above the door frame of each room by the burning *pandam*. This research focuses on the concept of drawing signs and the objective to be achieved by the *Shanthikarma*.

When the range of the sounds and gestures used by the ancient man were not sufficient to satisfy their communication requirements, they had created a stable visual communication system and the hieroglyphic communication can be observed at a certain updated phase of that communication system. In this research, attention has been paid to the

concept, which caused for the creation of hieroglyphs and other similar signs, the term 'Hieroglyphs' is applied looking beyond the limited range, in which the term hieroglyphs is placed in linguistics, and considering all the signs derived from the concept as hieroglyphs.

The communication in hieroglyphs cannot be highlighted as a tool created only for the communication of man and therefore more attention is paid in this research on the metaphysical communication concept represented in the system. It is an important juncture of the knowledge system, which is connected to the religious beliefs of the folk from the beginning of the history, and it demonstrates that a certain metaphysical communication system has also been created along with such knowledge system.

In this research, attention is paid to the signs made in Pandam *Dolaha Shanthikarma* in parallel to the hieroglyphics communication applied in ancient human society. Further, the signs made in *Pandam Dolaha Shanthikarma* by the possessed *Kapumahaththaya* can be identified as a specific event, which represents the evolution of the historical hieroglyphics ritual and its present application.

Objectives of the research

I. Identifying that an updated version of hieroglyphs is revealed in the practice of marking signs by possessed *Kapumahaththaya* in ritualistic *Pandam Dolaha Shanthikarma*.

II. Analyzing that the historical hieroglyphs means a ritual consists of metaphysical communication mode, which goes beyond a communication through a certain language.

Literature Review
Pandam Dolaha Shanthikarma

Pandam Dolaha Shanthikarma, which is inherent to Wayamba province, demonstrates varied presentations unique to each area, where it is practiced. The God worshipped in such area becomes the center of the practice and therefore certain differences can also be identified in the customs followed in the process.

Pandam Dolaha Shanthikarma, which is performed in *Demala Hathpaththu*, is dedicated to god Kambili and god Kadawara. (Dissamnayaka, 2003; 40). However this is performed in Katugampola Hathpaththu as a Shanthikarma dedicated to goddess Paththini and when it

is performed for healing purposes, *gotu* (an offering) is offered in the name of the devils and gods such as *Kadavara, Suniyam, Sohon, Kalu and Riri*. (Gunawardana, 2006;41). In other *Shanthikarmas*, basic customs such as beating of *Magul Bera* (A traditional drum), lighting oil lamps, conducting *Thewas* dancing on the beat of *Thewa pada*, carrying *Dewabharana* (jewelries of Gods) and cleaning of jewelries (*Nanumura*) are followed. (Dissanayaka, 2003;44). At the time of lighting *Pandamas*, they are brought to the place of ritual either from *Devala* or the house and virgin coconut oil, which is extracted at the same time, is used for lighting these *pandams*. The *Athura* (Patient) arrives keeping a *Dekum Vatti* (A tray of offerings) consists of *Bulath* (Betel), and *Puwak Mal* (Flowers of Areca Nut tree), and *Panduru* (Coins cleaned with turmeric water) and he hands over it to the *Kapu Mahaththya* after circling three times around *Pandam Thorana* (Pandal of Torches). Then *Kapumahaththaya* commences *yathikas* (A kind of appeals in songs) in front of the *Malpela* (A structure made of traditional items such as barks of banana tree, young leaves of coconut trees) holding twelve *pandams*. During this process *Kapumahaththya* is possessed gradually in the tune of *Kemmura pada* played by drum beaters in their drums and the songs. The next step is the fixing these *pandams* in the *Pandam thorana* (pandal). This ritual is followed at three times of the night and at the third time the custom for the protection of the house is practiced. The possessed *Kapumahaththya* enters the each room of the house holding a lighted pandam and spread resin on burning *pandam* and at last marks certain signs on the wall just above the door frame. However this is a task performed by a possessed person and therefore the same sign cannot be seen at every place. (Gunawardana, 2006;47-49)

Hieroglyphs

Two views are found on hieroglyphs at the international level; views in the aspect of communication and in the aspect of rituals. When considering the aspect of communication, it is linked with the origin of letters. The view on creation, on the other hand, on creation and evolution, represents the concepts connected to the religious beliefs of the man. The legend of Great Creation, which is rooted to the religion in the Western culture, presented the idea that the Almighty God has provided everything to the man. According to 'The Divine Origin Theory', the language was created by the God for the benefit of man. The people of Egypt in 3400 B.C. believed that the God *Thoth* gave them the language as a gift. In 2000 B.C.,

the Chinese people believed that that a God called *Shan Ti* sent them sample letters carving them on the shell of a tortoise. However the Aryan people lived in North Western India during 2000 B.C. believed that their language 'Sanskrit' was created by *Maha Brahma*. In the meantime, the people lived in Babylonia during 2000 B.C. believed that their language was a creation of God *Nabu*. According to the belief of the people in Nordic countries in 9-10 B.C. (Norway, Sweden, Iceland etc.) the language was a gift from God *Odin*. However, these ideologies, which were based on Devine Origin Theory, were later rejected by scholars but they were replaced by another concept based also on another kind of beliefs i.e. Inner Spirit Theory. The quintessence of this theory is that the man has a specific spiritual essence and it is the source of the language. However, this Inner Spirit Theory was rejected by Scholars and then another ideology has been made in place of the above. The new ideology was named as The Natural Theory. (Ranaweera, 2008, 21-25)

The scholars accepted the creation of language was a result of certain evolution. Even though language evolution theories such as Bow Bow Theory, Ding Dong Theory, Pooh Pooh Theory etc, were introduced to the fact that the languages were created in association with the daily activities of man and the sounds of nature, these theories were not recognized by linguistics. (Sumanajothi Pagngnaloka, 1999;3-4)

According to the language evolution theory, the origin of letterforms is connected with drawings sketches. Especially the scholars were unable to make a common conclusion regarding the idea communicated by the cave paintings at Alta Mira caves in Northern Spain. The main obstacle here is that a specific idea is not conveyed such paintings. Under such circumstance, the man had to find alternative media for written communication owing to this complexity in the contextual meaning. Therefore the concept of the expression of a certain idea with the help of a drawing came to practice and it was developed with the time to apply hieroglyphs in place of a word. (Ranaweera, 2008; 91-94)

The images of animals , which were drawn during the period of 35000-9000B.C. and found commonly in the places such as in Lascaux, Les Isis, Dordogone, and Niaux in France could not be seen among the cave paintings made by the man lived in caves around 7000 B.C. By that time they were used to draw images of men. Later, these sketches of men were transformed to a stylized form and they were stick figures and then came the era of drawing abstract sketches. Since these sketches were drawn to

convey a certain idea, they were named as pictograms. This process witnessed the transformation of the man from the era of sketches to the era of writing letters. (Ranaweera, 2008; 02-96)

The priests in Sumerian civilization during 9000-8000 B.C. used pictures for words for communication purposes and later it was transformed to a writing of concepts using pictures instead of words avoiding the weaknesses of the previous system. That method was introduced as Ideogram. Under this system, the ides of the image was communicated without representing the image. E.g. symbolizing the day by an image of the sun instead of depicting the sun itself. By the 2800 B.C. Sumerians had found phonogram system, which was designed in the form of making signs using the phonetics of the spoken language. Later they had communicated using signs in the shape of pegs on clay tablets by 2400 B.C. That method was identified as Cuneiform. This is a method came in to practice by way of simplifying the images. At later time, Egyptians had created their own hieroglyphic communication system with the help of cuneiform. In the meantime, the people of Harappa in Indus civilization have also used nearly 400 hieroglyphs around 3500 B.C. (Ranaweera, 2008; 103-137) .

Local characters of hieroglyphic tradition

The *Yakkhas* of ancient Ceylon had used certain characters, which were similar to the ancient letters and signs of the history of human. Even though they were not named as hieroglyphs, it was evident that they were also a kind of characters created transforming drawings to a simple form. The *Sri Pada* Character or *Suvibhadra* (Foot mark of Lord Buddha), which was used by *Yakkhas* to pay their respect was also a simplification of the mark of *Sri Pada*. Therefore it is required to pay attention also to the characters used specially by *Yakkhas* of Ceylon, which is relevant to the hieroglyphic tradition of our research.

The calligraphy of *Yakkhas* represents the concepts. Accordingly mother is represented by *Mauraki* character. In the same way characters had been used for different concepts whilst father, King, and Queen, are represented by *Pauraki, Baloja and Palali* characters respectively. For this purpose they had applied their own grammar. Further at certain occasions, they had used these characters for ritualistic purposes also. The *Dwanthra* characters or the signs carved on the first strand or *Indrabhata* of *Uththarachakra* (Necklace) worn by the women of *Yakkha* tribe can be

highlighted as an example for this practice. These characters had been carved with a view to make some power. Further *Rakun Sera* character had been applied to imply the power and authority of *Ravishayilasha vansha* (Clan) .In the same way *Kethaki Bhadraghata* had been applied for the blessing of the planets such as Sun and Moon whilst *Kavali Bhadrapada* was applied to win the attraction of the husband. (ස්වාමියා).(Wimalarathana, 2017;81-85) *(85-81;2017,විමලරතන)*

Since these hieroglyphs are found especially in tombstone, caves, *devalas*, and statues and further these hieroglyphs are very complex and unstable, Anthropologists are of the view that they might be used in ritualistic purposes connected to the folks' religion. In addition, the ancient characters found at the sites such as *Ruwanveliseya*, stone flights at *Mihinthalawa, Purana Gallen Vihara* at Galgamuwa, Mahagalkadavala, Thekkawaththa etc., which are very similar to the characters in *Varga Purnika* and believed as the characters made by *Yakhkhas* , can be believed as having carved in ritualistic aspects. (Wimalarathna, 2016; 50-90)

Further Manewe Wimalarathana Thero has introduced number of ancient characters, which symbolized the planets and which were added to Sinhala language from the language of *Yakhkha* clan. Even though all these researches discuss the matters such as the ritualistic meaning, communicative meaning, and the evolution of these characters, no such discussion takes place regarding the way these hieroglyphs are used in ritualistic purposes and the tasks performed with a view to attribute certain power to them at present. Both the verbal as well as silent communication is made by hieroglyphs and Anthropologists are of the view that this is a type of communication made only among humans.

Research methodology and the limits of the research

When the *Pandam Dolaha Shanthikarma* is studied under this research, data has been collected using participatory observation research method at the *Devalas* and houses, where this Shanthikarma was performed and further attempts were made at times, when it was needed to make further clarifications, to meet and conduct interviews with the *Aduras and Kapumahaththayas* (Practioners of this *Shanthikarma*) as well as *Athuras* (Patients) in order to have a wide picture of the objectives and customs of *Shanthikarma*. Further, the primary and secondary sources were also studied referencing manuscripts and other scholarly works, which contain relevant information.

For this research, the area called Katugampola Hathpaththuwa in Kurunegala district of North Western Province, where this *Shanthikarma* is performed, has been selected as the area of study and the main reason for such selection is that the people of above still perform this ritual as the main *Shanthikarma* for goddess *Paththini*. Though, it is possible to witness the practices of possessed practitioners whilst performing *Shanthikarmas* in different areas of Sri Lanka, this research studies particularly on the signs made by possessed practitioner focusing on *Pandam Dolaha Shanthikarma*. Further study on hieroglyphs is based on the information collected by exploring literary sources.

Analysis of data.

Throughout all of history, the thinking patterns of the people of relevant period are represented by the knowledge base built by such people. They have made various innovations as well as their thinking in response to the challenges and requirements of the era. The main factors behind the thinking of people are their necessities and the challenges, which they had to face with. When considering this point of view, the evolution of the above mentioned cave paintings up to hieroglyphs and then to alphabet is a reality in the virtual world, but no assumption can be made based on such situation that the main objective of the humans, who lived in the era from the cave paintings up to hieroglyphs, is the establishment of alphabet or written form of the language.

The man of such eras had paid his attention for satisfying strictly the daily needs of the life. Under such situation, the symbol system, which was developed from cave paintings to hieroglyphs, should represent objectively an essential factor of the human. Therefore it demands a wide examination on other areas, which are connected to the symbol system evolved from cave paintings to hieroglyphs. Attention should be made to the sites where these cave paintings, rock paintings, cuneiforms, and hieroglyphs with archaeological value are found. Mostly these cave paintings are found on high walls or the ceiling of the dark caves. (Ranawerera, 2008; 93) It is not an easy task to a painter to draw sketches in such higher places. For such work, the painter has to kindle a fire in the cave to illuminate the place. This means that drawing sketches in such places is a work, which demands a great effort and determination.

Similar painting tradition can be observed also in the tombs of Egypt. A tradition was followed in ancient Egypt, where the tombs with

mummies had been decorated with various drawings. Those drawings have been made in tombs to suit to the desires of the demised King or other drawings highlighted in books such as songs for the God Sun, which represent the life after death. At certain places drawings can be seen, which are connected to a private event occurred during the reign of the relevant King or to the kingdom of the dead. (Hewawasam, 2001; 205-206). It is obvious that communication made by drawing of paintings and characters in tombs were not for another community.

It can be identified as a ritual connected to the ancient Egyptian concept of *Osiris*. Most of the beliefs of ancient Egyptians are based on the *Osiris* concept. *Osiris* was killed by *Seth*, his own brother. The *Isis*, the wife of demised *Orisis* (1), who was thoroughly shocked by the death of her husband, found all the pieces and wrapped his body up, and brought them to the Egypt with the hope of enabling him to return to life. However *Seth* ,who had come and taken the parts of the dead body when Isis was not there, cut again them in to 40 pieces and buried at different places without giving a chance her to find it again. *Isis*, however found all the parts proving her devotion to husband and buried them with due respect. Later *Horas*, the son of *Osiris*, fought with *Seth* to take revenge for his father and the demised resurrected as a result of the rituals performed on the dead body of Osiris. (Moorthy, 1972; 25)

It is evident these events described in the story of Osiris are not limited only to the Egypt. The story of *Sinhabahu* describes the marriage between blood brother and sister. It is said in the story that *Sinhabahu* had built a kingdom called *Sinhapura* after marrying his own sister. *(Mv. Chap.06)* The reason for highlighting the marriage between brother and sister may be the idea of connecting the origin of a nation with heroism or divinity. Another story provides information regarding certain miracles made by *Paththini* proving her devotion. This part is described also in the event called *Mara Ipeddima* (Killing and bringing back to life) in *Devolmadu Shanthikarma*. (Dissanayake, 2003; 175) Further similar story is described in the *Mangara Deva Upath Kathava* (Birth of God *Mangara*) of *Sabaragamu Kirimadu Shanthikarma or Mangara Hella*. Prince *Mangara* was killed by a buffalo as a result of a hatred, which occurred in a previous birth. However, it is said in the story that Prince *Mangara* was brought back to life by a ritual called *Kiri Ithiraweema* (Spill of milk) performed by Prince *Endera*, friend of *Mangara*, using the parts of the buffalo, which killed the prince. (Maddumage, 2004; 56, 57)

The instances where the beliefs of ancient Egyptians were represented in the rituals of ancient Ceylonese could be traced in many cases. These are the common beliefs of human civilization all over the world and it is clear that they are not separate concepts for each country but common ones recognized by the world. Folk religions have been created on the belief for a metaphysical world or resurrection after death and such concepts can be identified even today in the main religious faiths. Resurrection of Jesus Christ is believed at present also by the Catholic communities all over the world. Therefore it is evident that a tradition for drawing certain signs in the tombs of the demised person has come to practice for communication based on the belief on a life after death. At such occasions various consumer items are also kept in the tombs of the dead person and Egyptians believe that as an offering made to the god of the dead, *Anubis*. However Chinese people conducted such practice for the benefit of the dead person i.e. for his consumption at his resurrection. (Moorthy, 1972; 30-91) Even though certain differences are observed in the beliefs of various cultures, application of a communication system to make a link with the world after death is commonly seen among people. Therefore it is clear that such hieroglyphs are a tool of rituals connected with folk religion and further it is no way a communication among humans but a communication maintained either with another force linked with the death or demised person.

The belief for the metaphysical protection can be identified as another objective observed in the application of hieroglyphs in the ritualistic aspect. Ancient Egyptians kept various weapons with the other consumer items in tombs. (Moorthy, 1972; 30) They kept these weapons for the protection of the demised person. However, similar activities can be identified in Sri Lanka such as taking measures for the protection of *Dhathu Garbha* (The part of *stupa* where relics are kept), which provide witness for totally different objective. (1) In the meantime attention is focused on drawings or characters in relation to our context.

When the sketches found in *Dhathu Garbha* of Mihinthala *Stupa*, these drawings cannot be shown as the sketches made for decorating the place. There is no point of drawing sketches at a place which is not open to the common folk. Under such circumstance, the nature of these drawings should be examined to find the objective of drawing sketches in *Dhathu Garbha*. Drawings of Gods, whose bottom is covered with clouds, can be seen there in the pose of keeping lotus flowers in hand. Further these

drawings have been made only with   brown and red lines and therefore it gives the conclusion that they have been made not just for the beauty. In the meantime the images of *Rahath Bhikkus* , which give the image below their knees, are found in the upper *Garbha*. Further the drawings found in *Mahiyangana Dhathu Garbha* portray the images of Gods, *Bhikkus, Brahmas*, and *Mara Divya Puthra*, in the pose of worshiping Lord Buddha. Taking in to consideration such drawings, an assumption can be made especially to the effect that a protection for the *stupa* was expected by way of drawing powerful figures in the pose of worshipping Lord Buddha. Further evidences are available to prove that hieroglyphs were there in *Mihinthala Dhathu Garbha*. Under this circumstance it is obvious that a certain protection had been expected through a combination of characters and drawings. (Charles, 2017;10-24)

This matter is further clarified by the drawing of *Mahameru Parwatha* (The giant rock) found in *Dhathu Garbha*. The goal of making such sketches is the protection with the stability depicted by *Mahameru Parwatha. (Premathilaka, 1998; 262)* In the meantime, the respect for *Dratharashtra* and *King Yama* is symbolized by two *Yakhkha* letters found at the places such as *Mihinthalaya* and *Jethavanaya* i.e. *Shebhana akshara* and *yama akshara* and it is believed that the main expectation of this respect is protection. (Wimalarathana, 2016;68)

Facts have been revealed to the effect that those symbols have been applied with the belief that a certain power was in either in hieroglyphs or other similar characters and symbols. In this case, applying power is expected by singing the characters of *Manthra Shastra* loudly and further establishment of power is expected by way of writing characters in *Yanthra Shastra*.   In this study attention is focused only to marking characters relevant to our context. Five characters or *Panchakshara* are found in *Manthra Shastra,* by which power is attributed.   The characters "අං,ඉං,උං,එං,ඔං " are marked on the *Alu Puhul* (Gourd), which is cut in *Shanthikaramas* like *Suniyam Kepima*.(1) Further characters are marked on a copper sheet when performing a *Shanthikarma* seeking protection from God. This ritual was for God Katharagama as it was performed by a Hindu priest. During this ritual the Priest marked the word 'Saravanabhava' in Tamil characters, which is a word similar to God Katharagama, on coppper sheets used for talismans. Further the word'Kali Matha' was marked in Tamil characters on *Maha Kali Yanthra*. (1) During the ritual, these sheets with the name of the God from whom protection is sought, are put in to

pots and buried, it is clear that is not an activity performed for communication among humans. The marking these characters in such rituals is protection from God or obtaining certain power from a God.

In *Yanthra Shastra*, a recognized theory can be identified for applying these characters. A term called *Ashta Karma* is mentioned *Bhutha Vidya* and these *Ashta Karma* are performed by *Yanthra and Manthra*. These *Ashta Karma* are as follows. *Vidveshana* (Driving to hate), *Uchchatana* (Chasing devils and other evil spirits), *Marana* (Killing), *Akarshana* (Attracting persons or bringing wealth), *Sthambhana* (Ending the existence), *Mohana* (Surrendering others) , *Peshanaya* (Healing), *Washikarana* (Getting the love of a certain person). This *Shastra* (Theory) specially names characters for making powers under each *Karma* (Action) . The character ”එ෦“ is named for *Vidveshana* and in the same way the characters ක“ ”ඖ෦“ ”ඔ෦“ ”ඔ෦“ඒළි෦”ඨ෦“ ”ඵ෦“ ”ෂඡ෦“ ”are determined respectively for *Uchchatana* (Chasing devils and other evil spirits), *Marana* (Killing), *Akarshana* (Attracting persons or bringing wealth), *Sthambhana* (Ending the existence), *Mohana* (Surrendering others) , *Peshanaya* (Healing), *Washikarana* (Getting the love of a certain person). (*Somakeerthi, 2016;21,22*)

When writing characters for the Gods in *Yanthra Shastra* , who hold powers in each matter, the tradition followed is making the character ”෦෦“ along with the first letter of the name of relevant God. Accordingly, characters are marked in the following manner.”අ෦“ is for Ananthaya, the Chief God for *Ata Disa* (Eight cardinal directions), ”ව෦“for Wasuki, In this way characters are marked for all the Gods connected to the ritual. (Somakeerthi, 2016, 69-71) This method proves that a recognized system is applied in marking character and other sketches in these rituals.

In certain *sura* (Talisman), which is worn with a view to have some protection from evil powers, contains a copper sheet with characters and line sketches. This is also not for communication among humans but it is expected to maintain metaphysical mode of communication. There is a belief that the characters or signs on the copper sheet , which is enclosed in such talisman, has certain power and further it is required to chant *Manthras* in a predetermined times whilst making other customs in order to attribute power. However at certain occasions, a possessed practitioner gives effect to the copper sheet in the talisman through his chanting under possession. If the same process is followed by both these practices, they

might have believed that the power has been given to the sheet by way of calling an invisible force.

The above concept is applied also in marking characters by a possessed practitioner in *Pandam Dolaha Shanthikarma.* The objective of marking these characters in this ritual is to give protection for the house from the bad effects of *Bhutha* and *Yaksha* (evil powers). For this purpose the *Kapumahaththaya of the Devala* (Practitioner) is possessed during *thunwana Yama* (The third part of the night) of *Pandama Dolaha Shanthikarma.* During this Shanthikarma, possessed practitioner blesses all the rooms spreading resin on a burning Pandama and when leaving the room he marks a sign on the wall just above the door frame. (1) The meaning of these marks made by the practitioner at the time of leaving every room should be to ensure protection of the area closing every access for evil spirits. It is observed that determining a limit for evil spirits is expected by marking such signs on the wall above door frame, which is the entrance. Another observation in this regard is that by way of marking these signs it is expected to attribute a metaphysical power.

Conclusion

The way that hieroglyphs concept, which represents an era of the human history and applied even in the present society even with certain differences, is revealed in the analysis of above factors. According to the Linguists, a certain contribution has been made by hieroglyphs for the creation of the alphabet of written language. However, another conclusion can also be made by the above facts that the goal of the human from ancient times in drawing symbolic characters such as hieroglyphs and cuneiform from the cave paintings is not to find a calligraphy art but to perform a ritualistic practice, which had been an inseparable part of their daily life.

Under such circumstance, three attitudes of ancient humans towards the characters or symbols such as hieroglyphs can be pointed out.

I. The belief of ancient human that they can maintain communication with invisible forces or persons after the death using character symbols.

II. The belief that a metaphysical protection can be made and its limits can also be determined through character symbols.

III. The belief that a certain power is instilled in character symbols and further an invisible power can also be attributed by the rituals practiced under possession or chanting *Manthras*.

Therefore it is obvious that hieroglyphs as well as similar character symbols mean an inseparable part of ritualistic practice. Further another conclusion, which can be can be made here, is that *Pandam Dolaha Shanthikarma*, in which these character symbols are applied in ritualistic practice, reveals an updated ritualistic practice rooted since time immemorial in human society. In the meantime, this paves way to construct another research hypothesis as to whether these hieroglyphs, which had been marked even at the places inaccessible to humans, had been made with the help of *avasha* (Under a possessed condition)) attributing a force beyond consciousness.

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