DIGITAL MULTIMODAL COMPOSITION IN AN ENGLISH LANGUAGE CLASSROOM: PEDAGOGY, EVALUATION AND PRACTICUM IN PAKISTAN

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LIST OF ABBREVIATIONS

CAR	Collaborative Action Research
DMC	Digital Multimodal Composition
DST	Digital Storytelling
EAL	English as an Additional Language
EAP	English for Academic Purposes
EFL	English as a Foreign Language
ELL	English Language Learners
ELL	English Language Learner
ESL	English as a Second Language
ESP	English for Specific Purposes
EU-MADE4LL	European Multimodal and Digital Education for Language Learning
FYC	First Year Composition
GeM	Genre and Multimodality
HEC	Higher Education Commission
IRB	Institutional Review Board
LL	Language Learner
LSR	Logosemantic relations
MAP	Multimodal Assessment Project
MDCAs	Multimodal Digital Classroom Assessments
MMAPS	Mode, Media, Audience, Purpose and Situation
MVR	Multimodal Visual Rubric
NLG	The New London Group (1996)
NWP	National Writing Project
OERs	Open Education Resources

RST	Rhetorical Structure Theory
SFL	Systemic Functional Linguistics
SNC	Single National Curriculum
SOPs	Standard Operating Procedures
SPSS	Statistical Package for Social Sciences
TA	Thematic Analysis
TOEFL	Test of English as a Foreign Language
USA	United States of America
VG	Visual Grammar
WHO	World Health Organisation

DECLARATION

I, Adeel Khalid S/O Khalid Mahmood, Registration No. 145-FLL/PHDENG/F20, a student of PhD (English) at the International Islamic University, Islamabad, hereby declare that, during the period of this study, I was not registered in any other degree programme and that this thesis has not been submitted for any degree or other purposes. The material produced in this thesis titled "Digital Multimodal Composition in an English Language Classroom: Pedagogy, Evaluation and Practicum in Pakistan" has not been submitted by me wholly or in part for any other academic award or qualification and shall not be submitted by me in future for obtaining any degree from this or any other university. I confirm that this thesis is the original work of the researcher except where otherwise acknowledged in the thesis.

I also understand that if evidence of plagiarism is found in my thesis/dissertation at any stage, even after the award of a degree, the work may be cancelled and the degree revoked.

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ABSTRACT

The inclusion of Digital Multimodal Composition (DMC) in English as a Second Language (ESL) classrooms has emerged as a new genre in academic writing. Writing in Pakistani institutions has been taught as a stand-alone skill, focusing mainly on the linguistic mode that needs to be reconceptualised, considering the demands of this technological era, where writing has been seen as a multimodal form of communication; therefore, the linguistic mode should not be a sole criterion while developing and evaluating writing. Utilising genre pedagogy combined with DMC allowed learners to construct translingual, transdisciplinary, and multimodal arguments using Google Sites. This study used formative experiments as a framework for planning and conducting data collection and analysis by collecting data from writing coordinators, instructors, and learners through learners' DMC artefacts, pre and post-tests, and unstructured and focused group interviews through quantitative and qualitative means, respectively. Quantitative findings suggested there have been significant improvements in learners' writing ability through DMC intervention; notwithstanding, qualitative findings suggested argumentation operated as a recognised method of communication through structured discourse, the factors influencing their design, and the role of structure in their recognition and interpretation that encouraged divergent perspectives in the ESL academic context and the inclusion and assessment of DMC into mainstream academic writing in the ESL context generated affordances together with constraints creating attitudinal differences among instructors and learners. This research recommends the revealed theoretical, pedagogical, and analytical frameworks to be implemented in digital multimodal composition, following the Genre and Multimodality (GeM) framework, that are significant in Pakistani English language classrooms and are pertinent to

communication purposes and practices. It is also suggested that further research needs to be conducted based on the technological and theoretical advancements in the field. To achieve this, the dissertation employed a data-driven approach to multimodal analysis, focusing on the structure of multimodal artefacts, the factors influencing their design, and the role of structure in their recognition and interpretation.

CHAPTER I. INTRODUCTION

Introduction to the Study

The inclusion of Digital Multimodal Composition (DMC) in English as a Second Language (ESL) classrooms has emerged as a new practice in academic writing, but little is known about how to develop, design, and evaluate a digital multimodal task for composition (Polio & Yoon, 2021). Researchers in early studies on composition and technology argue that academic writers must be equipped for the novel experiences of the digital world, as these are unprecedented and evolving rapidly (Hawisher & Selfe, 1999). These experiences now encompass reading, writing, and designing multimodal texts within today's digital communication landscape. In the ESL context, learners engage with various multimodal texts, such as blogs, websites, digital stories, electronic posters, digital timelines, video documentaries, podcasts, graphic novels, and PowerPoint presentations. These digital multimodal texts combine visual and textual elements to communicate meaning effectively. With the rise of new technologies, particularly during and after the pandemic, ESL academic writers increasingly focus on creating complex digital multimodal texts tailored for specific audiences and purposes (Jiang, 2018, 2022).

The term multimodality was introduced into the field of writing and composition studies with the seminal works of Kress (2000) and The New London Group (1996, 2010), and it refers to the *'use of different semiotic modes in the design of a semiotic product or event'* (Mills, 2015). DMC foreshadows designing a digital text with various semiotic resources, incorporating language and other modes, such as video, sound, images, etc., embedded into texts for communication and representation (Kress & Leeuwen, 2006; Thorne & Prior, 2014). Multimodal scholars Hafner and Ho

(2020) contend that digital learners convey meaning by composing multiple modes, and the latest studies in the field of ESL writing and composition have accentuated ways to develop and evaluate DMC into mainstream English composition. This development of DMC in academic writing raises opportunities for language learning and helps build multiliteracies linked to various representational modes (Jiang, 2017 & 2018). This recent permutation of scholars in computer and composition has implanted a place for DMC in English writing. It has, therefore, been at the forefront of pushing to develop DMC into traditional writing courses across the ESL context.

Unknown to the development and evaluation of multimodal digital composition in academic writing classes would be salutary from an intersection of multimodal pedagogy and composition in the ESL context (Choi & Yi, 2016). However, these ESL writers have not been inured to produce digital texts for academic purposes. Their DMC skills have been built on their prior linguistic knowledge and traditional writing skills for comprehension and communication (e.g., vocabulary, reading, phonics, grammar, writing, speaking, and listening) (Zhang *et al.,* 2023). As Swales (1990) highlights, DMC as a genre refers to a '*distinctive category of the discourse of any type, spoken or written, with or without literary aspirations*. In a special issue of the Journal of Second Language Writing in 2020, the researchers acknowledged the importance of developing and evaluating DMC as a part of the ESL practicum. They underscored DMC for ESL writing as it subsumed diverse genres, including digital posters, documentaries, multimodal presentations, digital stories, and blogs (Yi *et al.,* 2020). Contrarily, the idea of DMC development and evaluation through Visual Grammar (*henceforth VG*) informed genre pedagogy remains uninvestigated, uncharted, and under-theorised in the ESL context (Zhang, 2023). The doctrine of genre pedagogy has been employed and assigned as an

effective method of instruction that can enhance the teaching of writing skills in Pakistani ESL context (Asghar & Janjua, 2020). Allegedly, if practitioners aim at developing and evaluating digital composition skills in ESL learners in a writing class, in such a case, it is constitutive to discern teaching DMC through VG-informed genre pedagogy in the ESL context (Hafner & Ho, 2020), as these researchers do.

Consequently, this study seeks to advance the development and evaluation of DMC in English language writing by applying Hyland's (2007 & 2019) genre pedagogy for the development of DMC as a framework to develop explicit writing instructions to design an intervention for academic writing of DMC that fulfils the requirements of a university-level composition writing course (Gonzales, 2018; Wysocki *et al*., 2019). This study has been aligned with the call for developing research for DMC in an ESL setting (Shin *et al*., 2020; Stewart, 2023). This research provides critical insights and understanding of the development and evaluation of DMC in ESL writing.

Problem Statement

Teaching and learning academic writing have been a challenge in Pakistan, and argumentative writing is an important genre of academic writing. This genre of writing has been emphasised with recent shifts in curriculum standards, such as the Higher Education Commission's (HEC) policy for undergraduate studies and the English Studies Curriculum. Pakistan is striving to achieve its educational targets under both the Millennium Development Goals (MDGs) and the Sustainable Development Goals (SDGs), particularly SDG 4, which emphasizes ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all. In this context, equitable quality education cannot be realized without pedagogical innovation and systemic reform. Writing instructions have emphasised linguistic aspects; this approach, however, necessitates re-evaluation to

address the evolving demands of the technological era, where writing has been seen as a form of multimodal design activity, so that the linguistic mode should not be the sole criterion while developing into the ESL writing (Kim & Belcher, 2020). Despite global advancements in instructional writing pedagogies, traditional approaches in Pakistan remain inadequate for preparing university learners for the demands of the digital era. By deploying genre pedagogy in combination with DMC, learners may equip themselves with modern writing techniques that highlight knowledge about language in context so that learners can make intentional choices to communicate effectively in diverse modes. Hafner and Ho (2020) suggested that the genre-based pedagogy of DMC in the ESL context is subversive in studying digital affordances and choices of digital media and modes, and how these choices have been applied with multimodal choices that carry through the expectations of the target audience and a social and discourse function. Swales' notion of genre (1990, p. 58) states that *'a genre comprises a class of communicative events, the members of which share some set of communicative purposes'*; multimodal texts such as academic blogs are considered academic genres (Tiainen, 2012). However, it remains unexplored how to develop multimodal competence and how genre pedagogy as a tool can assist instructors in developing DMC instructional plans that support multimodal practices and what difficulties, if any, a teacher might encounter in their instruction in the ESL context (Hellmich, Castek, Smith *et al*., 2021). According to Graham and Benson (2010), most multimodal composing research is theoretical rather than offering actual classroom applications of these ideas. The current study fills this research gap by analysing a multimodal intervention in academic writing, especially argumentative writing, employing genre pedagogy. Although genre pedagogy has been experimented with as a useful method of developing the writing of ESL in Pakistani context (Asghar

& Janjua, 2020), its usefulness for DMC has neither been explored in Pakistan nor elsewhere. Developing multimodal tasks for the ESL context, evaluating those DMC tasks using a rubric, and providing a practical application of developing multimodal argumentative texts will help bridge these gaps in the field of ESL academic writing and composition.

Study Objectives

The study objectives of this research are to investigate the following:

a)   To investigate the impact of multimodal interventions through genre pedagogy in English Language Pakistani classrooms for the development of digital multimodal argumentative writing.

b)   To evaluate learners' digital multimodal argumentative tasks through the Genre and Multimodal (GeM) framework in the ESL context.

c)   To find out ESL learners' and writing instructors' perspectives on DMC inclusion and assessment practices in mainstream ESL academic curriculum.

Research Hypotheses

The driving research question of this study is to what degree a causal relationship exists between genre-based instructions and the development of argumentative writing performance while developing multimodal composition and in what ways the GeM framework systemically evaluates ESL learners' digital multimodal compositions. Based on this research question, the following hypotheses will be tested:

H_1:   Genre-based instructional interventions positively influence the argumentative writing performance of ESL learners while developing multimodal texts in an ESL writing course in a Pakistani ESL context.

H$_2$:   The application of the GeM framework in evaluating ESL learners' digital multimodal compositions yields a systematic assessment of genre, structure, and multimodal elements.

The Rationale of the Study

The study responds to the New London Group's (1996) concern that globalisation and technology have swayed learners' literacy, and it necessitates an extended definition of literacy, emphasising the multimodal aspect of communication. Numerous studies have noticed a dearth of research on adopting multimodality in the classroom, particularly for academic reasons (Wysocki *et al*., 2019). This study aims to understand how multimodality, based on a multiliteracies framework-based intervention, such as its design with digital multimodal tools, affects learner writing and how it may be used to strengthen learners' arguments. The study is based on the interaction between multimodality and one specific aspect of academic literacy – composing multimodal arguments. These multimodal arguments endorse the latest resources for knowledge production and reasoning (Huang, 2015; Stöckl, 2024). The argument genre serves as a tool for learners to develop their critical thinking skills and become engaged members of society by negotiating and defending values (Smith *et al*., 2013). There are various approaches to viewing an argument. An argument can be understood as a form, strategy, objective, or function, according to Rapanta *et al*. (2013). The form approach is motivated by Toulmin's (1958) work, which outlines how an argument is constructed using interdependent parts such as claim, supporting evidence, warrant, and backing. Toulmin (1958) states that in a conventional written argument, claims are backed by evidence supported by a warrant for constructing an argument. Based on Swales' philosophical underpinnings of genre analysis (1990), this research investigates linguistic and visual modes' archetypal functions and

affordances in collegiate discourse communities, especially those designed and developed for specific discipline genres. This research implements the designed formative experiment intervention following Hyland's genre pedagogy. It evaluates the impact of that genre-based intervention in a writing class, as the learners will harness digital apparatuses to create multimodal arguments in such forms as blogposts to address learner construction of multimodal arguments for this research.

GeM Intervention through Formative Experiment as a Research Method

This research used a formative experiment as a research approach to develop and assess DMC as a pedagogical intervention based on the theoretical underpinnings in Hyland's genre pedagogy and multimodality, which remain theoretical (Sewell & Denton, 2011). Components of genre and multimodality include DMC argumentative blogposts and Hyland's genre pedagogy, which inform this research about four consecutive writing stages (Hyland, 2019). This approach to teaching writing is subversive and equips learners to develop critical thinking and dismantle the hidden rules of academic success. These stages in the writing process involve building knowledge of the DMC field, modelling of text, joint construction of the text, and independent construction of text during an academic writing course in an ESL context. This formative experiment aims to inform instructors about the classroom context and make informed decisions about the intervention in practical terms (Bradley & Reinking, 2011). Many scholars have employed such formative experiments in the field of literacy in various contexts (Bradley *et al*., 2012; Reinking & Watkins, 2000) and multiliteracies at the secondary level (Howell *et al*., 2017; Howell, 2018). Such formative experiments categorically include a planned intervention based in a classroom setting, employing a theoretical framework to support the practical aspects of this experiment, and making localised theoretical

claims. It works toward a didactic purpose, going beyond merely specific research questions, adjusting and documenting all procedures to meet the pedagogical goal, and noting all changes because of the intervention in the learning context (Bradley & Reinking, 2011; Reinking & Bradley, 2008).

This research examined how the DMC as an intervention was used using a formative design approach and modified to meet the experiment's objectives: developing DMC-related assessment tasks. The pedagogical goal and research hypothesis guiding this experiment are that genre-based instructional interventions positively influence the argumentative writing performance of ESL learners while developing digital multimodal texts in an ESL writing course in Pakistani context. This study uses a formative experiment with a rigorous data collection method. This method treats all the collected data points as a connected web, allowing me to analyse how these variables influence each other (Reinking & Bradley, 2008). A formative experiment has been based on quantitative and qualitative data to support the theoretical assertions and extrapolate the application and context of the claimed intervention (Reinking & Bradley, 2008). The researcher allowed learners to compose and write an argumentative essay as their DMC task following the method of argumentation, consisting of six components: claim, grounds, warrant, qualifier, rebuttal, and backing (Toulmin, 1958). This intervention followed a sequence of activities based on three consecutive steps: first, the development of arguments including claims, evidence, and elaboration of evidence; second, the use of digital technologies appropriate for creating digital, multimodal arguments; and third, a genre-based approach to writing (Reinking & Watkins, 2000). The data were gathered from the learners' DMC artefacts of undergraduate English language learners; interviews with the writing instructors and writing program administrators were

conducted using semi-structured interviews. To investigate the causal relationship between genre pedagogy and DMC development in ESL writing performance of the intervention for DMC argumentative writing further, quantitative data were also gathered from learners' responses to pre- and post-argumentative writing prompts. The theoretical viewpoint of multiliteracies served as the foundation for this multimodal writing intervention, and data were analysed throughout this process of intervention before, during, and in the retrospective investigation (Gravemeijer & Cobb, 2006) to appraise innovative academic claims (Reinking & Bradley, 2008).

Significance of the Research

This study offers implications for curriculum development and multimodal argument task development as the study focuses on ESL learners' academic writing at the undergraduate level. The study informs language instructors and instructors to reflect on their composition pedagogies and incorporate digital tools into their composition classes. This impact directly benefits learners in English Language classes. I hope this study's findings augment a fresh viewpoint on teaching academic writing. From a pedagogical perspective, this research aims to develop class-based argumentative writing instructions based on Hyland's genre pedagogy and multimodal design using semiotic resources and teaching writing tasks while incorporating digital tools. Analytically, it evaluates learners' generated DMCs using the Genre and Multimodality (GeM) framework in the ESL context.

This study holds significant relevance in advancing the discourse on equitable and inclusive education in Pakistan, particularly in light of the country's ongoing challenges in meeting its commitments to the SDGs, specifically SDG 4: '*Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all*.' By introducing DMC as a pedagogical framework within the ESL context,

this study contributes a novel perspective on how multimodal literacy practices, while promoting multiliteracies, can bridge linguistic gaps, foster critical thinking, and empower the diverse needs of ESL learners. DMC enables students to engage meaningfully with content, even when linguistic proficiency is limited, thus promoting both educational inclusion and digital equity. Moreover, the study responds to the growing need for digitally literate, globally competent learners who can participate fully in the knowledge economy. The study aligns classroom practice with international development agendas and demonstrates how contextually grounded, multimodal pedagogies can support national education reform and the broader pursuit of sustainable, quality education for all. This makes the study not only relevant to the local policy and pedagogical landscape but also valuable to global discussions on language education, digital literacy, and social justice.

Organisation of the Thesis and Summary of the Chapter

This research examined multiliteracies perspective-based intervention. Three main components of this genre-based intervention were designed to help undergraduate learners produce academic multimodal arguments. I used a formative experiment approach to investigate how implementing such an intervention would affect the stated goal. This dissertation is organised into the following chapters. The first chapter (Introduction) aimed at establishing the niche of the field of DMC by occupying the niche in the domain of ESL academic writing such as what the theoretical and practical underpinnings of this research stirred me as a researcher to carry out this study, the contextualising within the framework of multiliteracy framework and problematising the study, research hypotheses were framed, supported by the significance and rationale of the study and delimiting the study were explained. Chapter two (Literature Review) studies the current body of literature within digital

multimodal composition, genre pedagogy, and GeM frameworks, as well as the use

and development of rubrics for argumentative writing within ESL academic writing. It

starts with discussing the approaches to digital multimodal compositions in ESL as a

point of departure. It explores the possibility of including and evaluating

multimodality in mainstream academic writing by establishing the research gap in the

existing body of knowledge. It extensively reviews the previous research that studied

alternative meaning-making resources for academic writers by mapping the genre and

multimodality. It also delineates the future directions in genre and multimodality. The

third chapter (Research Methodology) propounds the research methodology and

provides a rationale for using the formative experiment for this study. This chapter

delineates data collection, processing, organisation, and analysis. The fourth chapter

(Data Analysis) analyses data from various sources and research participants for this

study, focusing on evaluating DMC argumentative writing in the context of ESL

writing and testing the stated hypotheses for this study. Chapter five (Discussion)

discusses the findings, considering the existing literature and the addressed

hypotheses. The last chapter (Conclusion) summarises the overall dissertation and

proposes recommendations and future iterations for such an intervention in the wake

of the research findings. Contrarily, instructors and learners are enmeshed in complex,

intricate, multilayered processes of negotiating tensions on the inkling of inclusion

and evaluation of digital multimodal composition in ESL academic writing, as this

ongoing study investigates, proposes, and insinuates.

Key Terms and Concepts

Modes

Modes are collections of semiotic supplies, and the New London Group (1996) classified six modes of representation: multimodal, linguistic, audio, visual, spatial, and gestural (Bezemer & Kress, 2008; Jewitt, 2013; Kress & Leeuwen, 2006).

Multimodality

Multimodality deals with how different modes are used and how they correspond and interact mutually (Kress & Leeuwen, 2006; New London Group, 2010).

DMC

The operational definition of DMC is that a digital text uses two semiotic resources, i.e., textual and visual resources s composing in English using Google Sites. Digital Multimodal Composition (DMC) refers to digitally mediated learners-generated digital multimodal compositions for this research.

Multiliteracies

The New London Group (1996) coined the notion of multiliteracies to extend the definition of literacy beyond texts found in print. Digital multimodal text format is not new; it is becoming widely available due to globalisation and advanced technology, as they claim. In multiliteracies, '*design*' recognises the agency and semiotic resources used to create new meaning. Multiliteracies rely on intertextuality, demonstrating that everything is a remix (Fairclough, 1992; Ferguson, 2015).

Genre-based Instructions

The genre-based instructions follow a series of procedures, having built the context, modelling, joint, and independent construction laid out in Hyland's Genre-based instructions in ESL writing (Hyland, 2003).

Design

For this study, the term '*design*' has distinct connotations, as this study corresponds to multiliteracies, which combine three methods of meaning-making: Available designs, design, and redesign. Any constituents, modes, etc., employed inside a culture to create meaning are considered resources or available designs (Kress, 2009). The redesigned highlights use existing materials to produce new meaning (New London Group, 2010). The design leveraged here indicates that a conceptual theory of multimodality stresses the agentive, iterative process of meaning-making.

Genre and Multimodality 'GeM'

This study used the 'GeM' framework as an analytical model for understanding and designing multimodal texts by examining their structural organization across four descriptive layers: base (content), layout, navigation, and rhetorical structure.

Blogpost

For this study, blogposts refer to the webpages that the learners generated for this study using Google Sites, a prime tool for constructing websites.

CHAPTER II. LITERATURE REVIEW

Introduction to the Chapter

The following chapter covers the literature on Digital Multimodal Composition (DMC). It discusses the theoretical underpinning of the study by providing an all-inclusive analysis of the literature that comprises the theoretical concepts and researched knowledge of the study, embraces the inclusion of DMC in English as a Second Language (ESL), designing a DMC task for an argumentative writing class, formulates an instructional plan through genre pedagogy, and assesses DMC argumentative tasks. This research investigates the integration of Digital Multimodal Composing (DMC) within an academic writing course. The study seeks to improve the quality of learners' digital multimodal arguments by employing a pedagogical approach informed by Hyland's genre pedagogy. The effectiveness of this approach has been assessed through the evaluation of both written and multimodal tasks using the visual rubric *(see Appendix A)*. SDG-4 advocates for inclusive, equitable, and quality education, emphasizing not only access but also effective learning outcomes and lifelong learning (UNESCO, 2021). However, equitable education cannot be achieved through language policy alone without addressing pedagogy, assessment, and digital access (Tikly, 2021, 2024). Therefore, this research plans to identify a pedagogical aim and later design, implement, and evaluate a pedagogical intervention to achieve that goal in a writing class, as the learners were engaged in producing digital multimodal compositions through the application of digital tools in such forms as web blogs to address learner construction of multimodal arguments in this research (Adami, 2016; Jewitt *et al.,* 2016; Kjeldsen, 2015; Reinking & Bradley, 2008).

Theoretical Underpinning of the Study

Writing is multimodal and blends written words and non-linguistic texts assembled using tables, figures, typefaces, etc. Multimodality of writing has expanded to include social networks, sounds, and videos. This research has been designed to demonstrate that technology has impacted learners' literacy levels, necessitating an extended definition of literacy emphasising the multimodal aspect of communication (New London Group, 2010). They redefined the evolving nature of literacy and termed it multiliteracy, the framework of design and instruction for global learners, since the inception of the New London Group's idea of multiliteracies (Kress & Leeuwen, 2006; Kress, 20009). Moreover, others have advanced this topic in their work on genre studies, Systemic Functional Linguistics (SFL), and social semiotics in the context of English as a Second Language (ESL). The following section addresses and elaborates on the concept of multimodality in various dimensions.

Multimodality

The term multimodality was introduced into the field of writing and composition studies with the seminal works of Kress and Leeuwen (2006) and The New London Group (1996), and it refers to the *'use of different semiotic modes in the design of a semiotic product or event'* (Mills, 2015). DMC means designing a digital text with various semiotic resources, incorporating language and other modes, such as video, sound, images, etc., embedded into texts for communication and representation (Kress & Leeuwen, 2006; Thorne & Prior, 2014).

Multimodality is the process of communication and conveying meaning through multiple modes. According to Kress (2010), a mode is a supply of meaning provided by culture and shaped by society, such as a gesture, writing, language, sound, or image. It denotes the use of multiple modes to convey meaning and

communicate, and each mode ingrains culturally defined affordances (Albers & Harste, 2007). Each possesses unique characteristics or semiotic resources capitalised in any combination to create meaning (Wyatt-Smith & Kimber, 2009). Consequently, the mode type and the interplay between modes provide specific meanings for the writer and the reader. According to Hull and Nelson (2005), multimodality is not merely a collection of modes that pair one another or a technique for conveying the same content in various forms. Instead, it emphasises how multimodal design gives *the reader a special message that could not have been transferred through individual modes* (p. 251). However, there is debate over the term multimodality itself within the field of composition and rhetoric as it is ever-evolving. Rhetoricians have been debating over what it means to be multimodal and what it includes to make a text multimodal, as this field of study has been undergoing a significant shift, and there are divergent opinions on it among researchers and scholars working in this field. Previous research has shown that this term is a fluid construct and changes from discipline to discipline and context to context, yet remains intact within the foregrounding of its inherited meanings.

Multimodality refers to incorporating different modes to communicate and create meaning. In an academic context, this term has been used widely. Wootten (2006) distinguishes between computer-mediated discourse and multimodality and advises academicians to make this distinction and beware of 'the new' as it should neither be confused with other overload terminologies nor referred to the past nor future developments. Wysocki (2005) contends that *'new media texts'* are developed by authors who know and understand how multimodal texts can exist and deliberately emphasise those multimodal aspects in their work. Selfe and Takayoshi (2007) reinforce this idea of multimodality and claim that student writing has not changed

over time. However, multimodality allows learners to incorporate multimodal aspects such as sound, video, and words to compose new texts and challenge the traditional academic writing canons. It creates a tapestry of modes weaving into one another, yet creating a coherent composition.

Multiliteracies and Multimodality

The New London Group (1996) conceived the term *'multiliteracies'* to consider the various non-linguistic literacies or ways of representation that are not limited to language. They characterised multiple modes of meaning, including visual, linguistic, spatial, gestural, audio, and multimodal, alleging that multimodal is the quintessential aspect as it *combines various other elements* (p. 80). Many theorists, such as Bazalgette, Buckingham, and Pantaleo, claim that all composed texts are multimodal, including print texts, because authors use modal design elements, for instance, font and page layout, when creating print texts (Bazalgette & Buckingham, 2013; & Pantaleo, 2012, 2019). Contrarily, it has been noted that print literacy still has an edge over digital literacy in the mainstream education system in Pakistan (Ameen & Gorman, 2009). The entire education system must revisit and rethink what it takes to implement new literacy, which must be treated as core literacy, to implement multiliteracies and multimodality in Pakistani ESL context (Junejo *et al.,* 2018; Mills, 2015).

Multimodal scholars expanded communication media and increased their concentration on globalisation and cultural diversity. Like the New London Group (1996), researchers have also drawn their attention to the need to accept changes in communication that could emerge because of the expansion of learners' availability of multimodality and various forms of text (such as both traditional and computerised), together with the promotion of inclusive pedagogy. The New London Group (1996)

shared (Lanham, 1989) a favourable position that believed that as digital tools become accessible, learners would have more opportunities and information to plan and produce their texts, democratising literacy. The New London Group's (1996) discussion of the evolving nature of literacy and the crucial pedagogical practices required to accompany such change extended the concept of literacy. It assisted others in considering how education is evolving in an era of developing digital capabilities to accompany such change by naming this concept as multiliteracies. They foresaw the importance of digital tools in education, and their goal was two-fold for the learners; one, they aimed for learners to be active global citizens in this digital age, and second, they aspired for learners to have entrée to the various communication ways necessary to participate in manifold settings.

New media have brought about a significant shift in how we think about literacies, writing, and composition due to the rise and evolution of technological advancements. The New London Group (1996) argues for a broader definition of literacy encompassing written text, visual images, and other multimedia elements. This concept of multimodality challenges traditional, authoritarian views of literacy that focus on a single mode of expression. The implications of such ideas on composition studies have been evolving and redefining the concepts of developing literacies. It must *'now account for the burgeoning variety of text forms...such as visual images and their relationship to the written word'* (p. 61). These ramifications have made a tipping point in the way we teach and the ways our learners learn, as demanded by a Kuhnian paradigm.

Selber (2004) emphasises the need for faculty to pursue their expansion on the idea of multiliteracies in the discipline of rhetoric and composition, particularly when it comes to integrating technology meaningfully into their teaching and designing

writing courses. He identifies three critical aspects of computer literacy: functional literacy, computer operating ability, and technology. Second, essential analyses of literacy and questions of computer-mediated texts' underlying ideologies and biases. This critical literacy goes beyond probing learners *'to recognise and question the politics of computers' (p. 175)*. This type of literacy examines popular concepts and forms in digital literacy and aims to comprehend how these interpretations affect the characteristics of texts mediated by computers. Finally, rhetorical literacy stresses understanding the role of the author in creating content and technology, as well as the unique nature of hypertextual digital content. These three varieties of literacies operate together, in Selber's opinion, to provide a thorough and tenable awareness of multiliteracies.

Pedagogy of Design in the New London Group (1996)

This multimodal approach highlights how representations and meaning-making are achieved through many modalities and communicative activities. It also underlines how knowledge has shape and content (Björklund Boistrup & Selander, 2022). This assertion assumes that information on various subjects or ideas of the universe is acknowledged by employing semiotic representations connected to protocols and prevailing cultures of recognition in academic disciplines (Kress & Selander, 2012; Selander & Kress, 2021). In their proposal on multiliteracies, the New London Group (1996) discussed the pedagogy of design. They recommended that three components be used in creating and consuming all literature: Available Design, Designing, and Redesigning. The available design is the relationship between modes or the *'grammars'* of social semiotic systems. Designing creates meaning through various modalities, including intertextuality and *'contextualisation and representation'* (New London Group, 2010). Design is the process by which scholars employ tools to

produce the texts or representations they have in mind (Albers & Harste, 2007) and
how they recognise authorised content in a specific *'semiotic domain'* (Gee, 2008).
Redesign is the change in explication, in which the *'meaning producers remake
themselves'* while modifying the already *'Available Designs'* (New London Group,
1996). Particularly with increased access to technology, several design methods, such
as remixes, are available to pick from while developing a text.
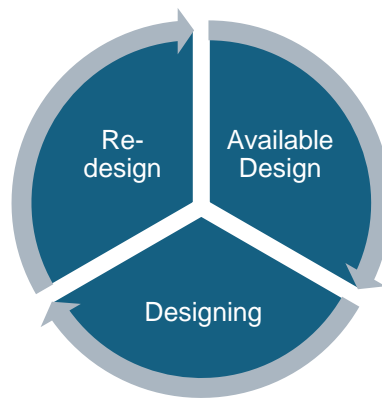
Figure 2.1: *The design process inspired by the work of NLG (1996)*

Teaching DMC through the pedagogy of design in the classroom necessitates
explicit instructions on the grammar of design elements or metalanguage. Contrarily,
Bazalgette and Buckingham (2013) provide instructors and learners with a mechanism
to navigate through multimodal materials, even though understanding multimodal
texts requires considering elements beyond traditional grammar rules. Bazalgette and
Buckingham (2012) suggest that one should consider context in addition to grammar
and design when studying a text (e.g., production, intended audience) (p. 5). A formal
method for visual analysis with several recommendations for understanding visual
design can be observed in Kress and Leeuwen's Grammar of Visual Design (1996).
Metalanguage grammar can achieve a shared comprehension between the author and
the audience. The ability of learners to comprehend design would help them better
understand the social context and goal of a multimodal text (Walsh, 2008). Therefore,

if they work as designers and producers and follow conventions on DMC, their understanding gets more profound, fulfil epistemic obligations, and recognise the affordances using textual and visual resources (Björklund Boistrup & Selander, 2022; Ho *et al.,* 2011; Svärdemo Åberg, 2022). Baron (2009) analyses the new genres that the computer has ushered in, including YouTube, Facebook, blogposts, Wikipedia, email, instant messaging, web pages, and community-generated texts, for instance, the Urban Dictionary and Myspace.

Approaches to Digital Multimodal Composition in ESL

Social Semiotics

A substantial change in research was triggered by Halliday's views on language in his books *'Language as Social Semiotics'* (Halliday, 1978) and *'An Introduction to Functional Grammar'* (Halliday, 1985). He made a compelling case for shifting research focus from conventional structures, such as sentences and grammar, to function, such as semiotic resources and discourse. The goal of social semiotics research is to understand how individuals wield semiotic stock (such as spoken words, written words, visuals, sound, and gestures) in daily life, which includes all forms of communication (or meaning-making, as they put it), comprising language and cultural resources, and how they are used and altered by social interaction. Scholars have illuminated their agency and identities by examining how writers choose and capitalise on different semiotic resources to develop a multimodal text (Cimasko & Shin, 2017; Jiang, 2018; Tardy, 2006). Traditional semiotics, in contrast, views semiotic systems as rigid laws of meaning and signals. Thanks to new digital media, writers now access a broader range of semiotic resources, including linguistic elements like words and non-linguistic ones like images, sounds, hyperlinks, colours, and videos (Jewitt, 2008). Now, writing involves combining the accessible semiotic

resources and modes, which supports the idea of writing as designed in multimodal composition with enlarged semiotic resources (Kress, 2003; New London Group, 1996). Studies with a social semiotics foundation frequently examine how many non-linguistic resources and modalities for meaning construction have been integrated into multimodal texts as an ensemble or semiotic. They have demonstrated how multimodal affordances support ESL authors in communicating their anticipated meanings with more authorial agency by (re)designing the semiotic resources and modes available in the composition medium (Shin *et al*., 2020). Thus, multimodal composition can produce newfound implications through writers redesigning and appropriating available semiotic materials in the ESL context.

Systemic Functional Linguistics (SFL)

To fulfil one of the three metafunctions – ideational (field), interpersonal (tenor), or textual (mode) metafunctions, SFL studies how language operates, one of the semiotic systems interacts with other semiotic resources. SFL looks at how one of the semiotic organisations, language, interacts with other semiotic materials to produce meaning to carry out one of the three metafunctions: ideational (field), interpersonal (tenor), or textual (mode). Additionally, SFL researchers believe that a specific linguistic trait is preferred over other alternatives when the conditions are present. In this sense, a person's language is a system chosen to serve a particular purpose in each situation. Thus, SFL emphasises the importance of the context in which language has been leveraged. Research in the field of SFL extensively draws on analysing the discourse of multimodal composition and SFL multimodal discourse analysis within multimodality and beyond (Kress & Leeuwen, 2006; O'Halloran, 2004). Research studies conceptualising it as a social and cultural practice of meaning-making have

examined how different modalities (such as language, images, and music) interact to produce meaning (Kress, 2009).

Analysing Genres in ESL Composition: A Multimodal Approach

Studies of academic genres have started to reveal the traditions of various modes in particular discourse groups as awareness of multimodality grows (e.g., D'Angelo, 2016; C.-W. Huang & Archer, 2017; Mogull & Stanfield, 2015; Morell, 2015; Rowley-Jolivet, 2012). For instance, the preceding genre studies (Swales, 1990), these investigations illustrated the functions and advantages of visual and linguistic genres in scholarly discourse communities through rhetorical analyses. To be aware of this, scholars have adapted analytical frameworks from multimodal discourse analysis and social semiotic multimodal analysis. Even so, these genre studies aim to demonstrate consistent discourse patterns in a specific community (except Mogull & Stanfield, 2015). Additionally, numerous researchers on multimodal academic and technical communication examined presentation genres, where speaking and gestures were examined with visual assistance for presentations, for instance, PowerPoint slides (Mogull & Stanfield, 2015; Morell, 2015; Rowley-Jolivet, 2012). The purpose of multimodal academic genre studies was to provide general tendencies in employing multiple modes by performing functional analysis on sample texts from various genres.

Genre and Multimodality (GeM) Framework

The Genre and Multimodality (GeM) framework that Bateman (2008) proposed to study the structure of a multimodal artefact. As the model's name implies, the genre is a core concept within this model, serving as a basis for comparing artefacts and theorising how they use semiotic modes (Bateman, 2008). Applying the GeM framework to study learners' generated DMCs, especially the structural aspects of

multimodal artefacts, involves finding multimodal and textual phenomena by incorporating the results into the theory. Bateman (2008) provides an outline to justify the use of the GeM framework by terming it as a single set of tools that can be used to analyse any multimodal artefact that 'can provide reproducible, and therefore evaluable analyses of what is involved in the multiplication of meanings discovered.'

Multimodal Studies Within the GeM Model

The GeM model (Bateman *et al*., 2007; Bateman, 2008; Bateman, 2014; Delin *et al*., 2002) explains the motivation behind creating the GeM research project. The framework is designed to analyse static multimodal artefacts systematically and empirically (Bateman *et al*., 2017; Bateman, 2013) and is used to analyse non-static multimodal and filmic artefacts. Treating any multimodal page as a multilayered semiotic artefact, Bateman (2008) identifies four primary systematic levels in the GeM model: base, layout, rhetorical, and navigation. Scholars use the GeM model to analyse static multimodal artefacts such as technical manuals, bird field guides, newspapers, blogposts, advertisements, municipal websites, tourism websites, research monographs, and annual reports. Examples include works by Bateman (2008, 2009, 2012), Kong (2013), Hiippala (2015, 2017), Delin, Henschel, and Nekić. Drawing from Bateman (2008) as a conceptual foundation rather than a practical implementation, Seizov (2014) introduces a five-layer annotation schema called 'Imagery and Communication in Online Narratives': iconographical, material, production, communication, and multimodal layers. This schema is used to analyse political communication from a visual perspective.

The primary efforts in creating fully GeM-annotated corpora for studies on product packaging and blogposts were made by Hiippala (2015) and Thomas (2009, 2014). Kong (2013) studied by choosing and pairing news items from English and Hong

Kong newspapers and examined how base units in selected news items from two tabloid newspapers are used at the semiotic level to compare their verbal-visual composition and arrangement. Based on data analysis, this study reveals that Chinese news favours an atomisation approach, while English news leans towards a graphic composite approach. His findings have significant implications for culture. Therefore, future studies should investigate the correlation between layout preferences and culture. Zhang (2018) explored how public academic blogposts for his doctoral dissertation are used by annotating each poster page's content, the layout structure, and rhetorical sequence, organising and building an XML-based multimodal corpus. His research highlighted an empirical basis for analysing the diverse semiotic resources for expressing Logico-Semantic Relations (LSR) as tactical patterns and examining the potential impact of aligning hierarchical rhetorical structures with layout arrangements (Zhang, 2018).

Multimodality through Genre-Pedagogy

Writing is conceptualised as constructing means of representation in creating multimodal texts to transmit desired meanings, according to the New London Group's (1996) concept of multiliteracies. Multiliteracies stresses a multimodal, culturally grounded literary practice with relationships, ideologies, texts, and objects that reconcile the practices, sharing theoretical ground with sociocultural theories that understand literacy as flexible, multifaceted, and context-dependent (Street, 2006). Additionally, multiliteracies contend that meaning-making and texts are shaped by socio-historical and located in context (Cope & Kalantzis, 2009). Genre pedagogy (Derewianka, 2003; Hyland, 2007; Martin, 2013) capitalises on an instructional cycle that includes four steps: first, constructing the field, breaking down a text, co-constructing a text, and finally, individual construction. Instructors help learners

understand the steps of a classroom text and give them the tools they need for
purpose, vocabulary, and structure to leverage and assemble assignments. Using
multimodal literacy strategies, a learner impounds and designs texts using available
modes. Learners build new meanings concerning the cultural and individual identities
linked by using the modes accessible as instruments for social and cultural meaning-
making. Learners develop new meanings with the artistic and personal identities with
which they are associated by using the modes readily available as social and cultural
meaning-making tools. These studies in this field examined how learners produce
multimodal texts and defined their use. They have demonstrated how social
positioning and socio-historical circumstances influence ESL learners' multimodal
composition and utilisation (Cope & Kalantzis, 2009).

Table 2.1. *Synthesis of Approaches in DMC of Literature Findings*

Sr #	Approach	Focus	Theoretical Frameworks in DMC	DMC in ESL Writing
1	Social semiotic multimodal	Situated choice of resources	Social semiotics (Halliday, 1978)	Cimasko & Shin (2017); Smith, Pacheco, & Rossato De Almeida (2017)
2	Multimodal discourse	Metafunction system of available resources	SFL (Halliday, 1985)	Alyousef (2016); Anderson *et al.* (2017)
3	Multimodal genre	Genre-specific grammar for language and visuals	Genre analysis (Swales, 1990)	Molle & Prior (2008); Tardy (2005)
4	Multimodality through Genre Pedagogy	Multimodal Pedagogy and Writing Process	Hyland's Genre Pedagogy	

Argumentative Writing as a Genre in ESL

The genre of argumentative writing is essential to both academic and everyday
writing. Argumentative writing has become more critical due to recent changes in
curriculum requirements, such as the Higher Education Commission (HEC). Logical
reasoning and argumentative writing frequently go together (McCleary, 1979; Yeh,

1998). Argumentative writing is often challenging for learners despite its importance for various objectives, including operating civic involvement and intellectual discourse (Knudson, 1992; Yeh, 1998). Although argumentation is frequently considered essential to academic literacy, its place in L2 writing is under-investigated and unexplored. As Hirvela (2017) points out, it has long been held that L2 writing research has largely dismissed argumentation as a fundamental practice, favoring a preoccupation with grammatical competency or genre recognition.

Writing issues have been frequently addressed using genre conceptions and theories, where writing is described as a planned, deliberate text production and social activity with a precise communication aim within a particular community (Hyland, 2004; Johns, 2015). It enhances the investigation of argumentation in writing in ESL or EFL. The term '*argumentative genre*' describes how authors share their opinions and supporting evidence about a subject or problem with potential readers. Authors develop their arguments within a genre with a realistic, coherent framework, suitable visual language, and valid arguments that a community's audience would find convincing (Pessoa, 2017). Genre knowledge is characterised as learners' conceptual understanding, such as the capacity to identify elements of a particular genre (Hyon, 2001) and the capacity to evaluate the setting and goal of the genre prior to creating writing-related decisions (Cheng, 2007).

To determine the trends in the knowledge that learners have about specific genres when they write, Tardy (2009) proposed a genre knowledge model. Four components of genre knowledge are described in this model: understanding of the subject matter, process knowledge, rhetorical knowledge, and academic knowledge (Tardy, 2009). He implied that these four components are unique and have interactions with each other. Formal knowledge focuses on learners' comprehension

of textual elements in a particular genre, including textual format, lexicon-grammatical tradition, and standard structural stages. The term *'rhetorical knowledge'* describes learners' comprehension of the apparent aim of a genre in a particular setting, their nuanced awareness of the audience's beliefs, and their awareness of situated factors in various social contexts. Subject-matter knowledge is combined with all the composition procedures that support the intended rhetorical action in a writing assignment to form process knowledge (Pflaeging & Stöckl, 2021).

It is crucial to remember that the level of genre expertise experienced authors possess varies. Remarkably, the dimensions of genre knowledge of experienced ESL writers did not overlap much, and they had superior formal understanding compared to other parts (Yasuda, 2011). In the context of ESL writing, several academics have looked at how learners build their knowledge of different genres, for instance, the summary genre (Yasuda, 2015), the reviewing literature genre (Wette, 2017), and the research paper writing as a genre (Huang, 2014). Uzun (2016) suggests that a thorough examination of learners' argumentation within the framework of the genre was necessary. Further research is, therefore, essential to understanding better how learners organise their knowledge of various argumentative writing aspects according to genre (Hyland, 2004). Hirvela (2021) and Hirvela and Belcher (2021) underscore the imperative to foreground argumentative expertise in research and pedagogy. The research responds to that call by incorporating Toulmin's model into a multimodal ESL writing pedagogy.

By employing the metaphor of design, the NLG (1996) identified the necessity for multiliteracies to give learners agency; accordingly, they might affect upright social change: *'learners, as meaning-makers, become designers of social futures'* (p. 65). It also brought awareness to existing socio-cultural surroundings that were

starting to shift, but had long been served by conventional teaching. The idea of multiliteracies was put up to refute traditional notions of literacy-based only on language use in written prose. The NLG (1996) believes that because of the world's political, cultural, and economic changes, its views on literacy teaching and its goals should have evolved. Composing traditional arguments is a valuable rhetorical skill associated with the socio-cultural focus of multiliteracies. However, when the argument is conceived within the affordances of digital texts, it is enhanced with creative potential. For example, arguments and rhetorical devices are more distinctly possible to use visual and auditory cues, often becoming less philosophical and abstract (Lanham, 1993).

Moreover, the NLG (1996) observed, *'members of subcultures can and sometimes do find their voices through the new multimedia and hypermedia channels' (p. 70).* When learners are able to *'creatively extend and apply it [constructive critique] ...within old communities and in new ones,'* online communication can foster civic creativity involvement (NLG, 1996). As a result, involving learners in creating an argument for meaning, for instance, online, serves as a beneficial link between the goals of the multiliteracies perspective and traditional literacy's aims.

Toulmin's Model of Argumentation

The argument construction includes a claim, supporting evidence, and an explanation of that supporting evidence; it follows the first fundamental component of the intervention. Several researchers have urged learners to make more persuasive arguments by understanding the structure of arguments (Knudson, 1992; Yeh, 1998). Toulmin's (1958) standards for an academic argument have been consumed while teaching writing and composition studies (Hillocks, 2011; Howell, 2018; Lunsford, 2002; Smith *et al*., 2013) and research on argumentative writing as a genre (Knudson,

1992; McCleary, 1979; Yeh, 1998). His criteria were applied in this investigation (1958), instructing learners to assert an argument, reinforce it, and justify their evidence by emphasising claims, evidence, and elaboration of proof. Research demonstrates that the explanation of evidence in an argument might be dynamic, implied, and dependent upon the context of the learners.

In contrast, the term warrant might not indicate the same. Therefore, this study elaborates evidence in place of the phrase warrant from above above-stated model (Lunsford, 2002; Toulmin, 1958). There is a possibility that learners would describe the evidence using specific methods that are not usually connected to a warrant, such as illustrating or summarising the evidence (Klein & Rose, 2010). Other argument studies have used elaboration of evidence (a broader term) instead of a warrant. Based on Toulmin's Model (1958), these three components represent the bare minimum requirement that he estimated for this pattern:

Data must be produced for an argument: without any data created in its support, a bare conclusion is no argument. However, the backing of the warrants we invoke need not be made explicit at any rate; the warrants may be conceded without challenge, and their support left understood (p. 98).

Therefore, at a minimum, an argument's claim must be supported by evidence, and an explicit or implicit logical connection must be drawn, showing how the evidence does so. McCleary (1979) showed that improving critical thinking was a side effect of teaching argument logic, but not necessarily an improvement in creating persuasive arguments. Notwithstanding, some researchers, such as Knudson (1992), observed that learners need to be taught the requirements for producing compelling arguments since they are frequently less familiar with an argument's genre than with

other genres, for instance, narration. In addition, Yeh (1998) investigated whether

immersion in arguments without formal instruction differed from explicit training in

arguing. Four language arts classrooms teaching seventh graders, two teachers, and

116 learners participated in the study. They investigated the potential differences

between immersion in argumentation without explicit instruction and explicit

instruction. Yeh (1998) discovered in that study that students profited from specific

instruction in argument; the treatment group outperformed the control group, which

did not receive explicit instruction in argument.
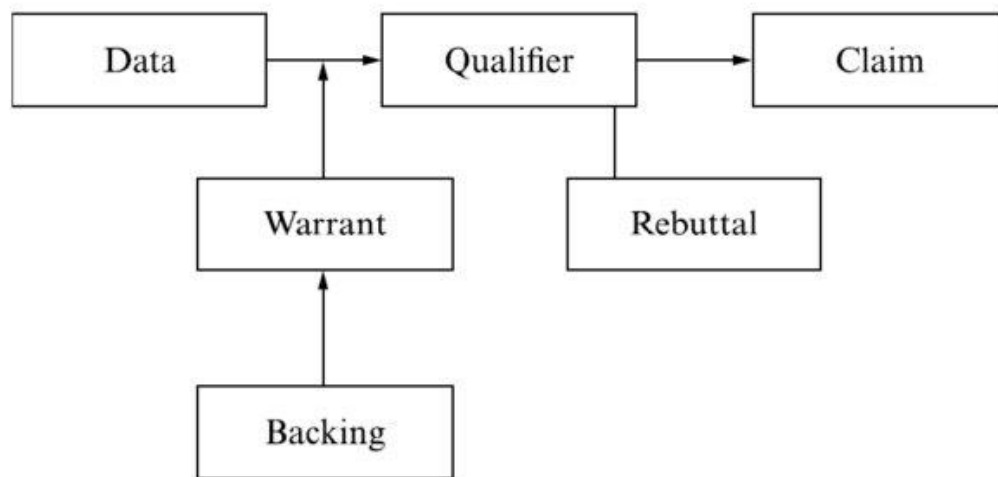
Figure 2.2: *Toulmin (1958)'s Model of Argument*

The development of solid and persuasive arguments may be traced back to

Aristotle, who asserted that an argument should be organised with a conclusion, a

minor premise, and a primary premise. This type of argument, notwithstanding,

makes unmistakable claims about absolute truth that are not always consistent with

those made in everyday discourse. Aristotle's Model, for instance, does not support

degrees of statements and qualifications. Consequently, Toulmin (1958) believed

there is a need to develop an argumentative style that conveyed not only statements

but also inquiries concerning those statements and answers to those inquiries

regarding the statements: *'where the logician has in the past cramped all general*

statements into his predetermined form, practical speech has habitually employed a

dozen different forms' (p. 109). As a result, he developed an argumentation model

with six essential elements, i.e., claim, ground, warrant, qualifier, rebuttal, and

backing (Toulmin, 1958). Because of the relationship to everyday language, scholars

and educators have adopted his framework to analyse arguments across various fields

and taught regularly in composition classes (Knudson, 1992; Lunsford, 2002;

McCleary, 1979; Smith *et al*., 2013).

      Researchers investigating the argumentative writing genre deliberate that

Toulmin's Model lacks research, as this model is adapted as a heuristic device or as

an analytic tool, and there is a need for *'mediated by other writing instructions.'* Even

so, a writing class frequently instructs on this type of argument (Lunsford, 2002).

Researchers agreed that there is a lack of investigation into writing and reasoning

(McCleary, 1979). There is not enough emphasis on teaching argumentative writing

and the logical reasoning required for such writing. A meta-analysis of research in

rhetoric and composition from 1963 to 1982 was conducted by Hillocks (1986). They

found that studies exploring methods for teaching argumentation were relatively

scarce and sparse. A closer analysis indicates variance in the results. It proposed the

prospects for researching argumentative writing training, even though studies showed

that specific argumentative Instruction in thinking produced notable advantages for

the treatment group compared to the control group (Hillocks, 1986).

      As a cognitive model, Toulmin's Model of argument is frequently instructed

(Lunsford, 2002; Newell *et al*., 2011) instead of a social model. Social models

examine social practices of argumentation, whereas cognitive models focus on the

form and structure of arguments (such as claims, warrants, etc.). Educating this model

as purely cognitive misses Toulmin's belief that arguments vary depending on when

and where they are delivered and heard, together with being relentless, as in the structural representation's phases (Andrews, 1997; Lunsford, 2002; Newell *et al*., 2011; Toulmin, 1958). The socio-cultural context of arguments and the social practice of argument is increasingly significant. It may indicate that a new genre of argument is required, markedly undertaking the context multimodality enabled by the expanding amount and diversity of digital instruments.

Newell *et al*. (2011) reviewed the literature on the argument, covering empirical research between 1985 and 2011. The research stated that cognitive and social views were frequently used as starting points by individuals who studied, instructed, and considered arguments. The writers examined the mental approach of argument, which focuses on the form and structure of arguments, such as Toulmin's Model (1958). Additionally, they provided a social viewpoint on the argument, focusing on the intended audience and how those audiences and the argument's social environment influence its development. Instead of portraying these viewpoints as opposed, the authors concluded that more research, for instance, the present study, was necessary to realise how they interacted. They discovered that the argument is frequently taken to support literacy and writing.

On the other hand, additional research is needed to fully understand the ramifications of an argument, how to teach it, and how the context of the parties involved can affect it. Research on arguments evaluated from a social perspective has been scant up to this point (Newell *et al*., 2011). The current study thus attempts to fill this gap by improving learners' arguments through a method that combines both cognitive components and social practice of arguments. Cognitive components cover all essential elements of an argument, and social components comprise the learners' design aspects, such as instructing learners to create arguments mediated by the

various digital tools and modalities of their sociocultural ESL setting. Argument and argumentation have gained currency at the primary, secondary, and undergraduate levels in recent years.

According to the function and goal approach (Rapanta *et al*., 2013), an argument consigns to the most critical communication modes; instead of focusing on individual elements, we should consider whether a specific element (like a word, image, or sound) contributes meaningfully to the overall communication (functional load). We also need to determine the most suitable mode (like written text, video, or infographic) for the task at hand, considering the unique strengths and communication purposes of each mode (functional specialisation) (Kress, 2009). As a result of its significance in the development of knowledge competencies, the concept of argument has been employed in several approaches in academic discourse. It is one of the most argued-about competencies in education. Nevertheless, few studies have focused on the fact that while resources are available on written argumentation in undergraduate-level essays, there is a significant gap in materials that emphasise learning skills and using visual resources to enhance those academic arguments.

Knudson's (1992) direct training of the argument criteria is further supported by research on learners in secondary school, where they were graded on writing prompts after receiving alternative instructional methodologies. He concluded in the light of his results that multiple regression analysis and teaching argumentation should be part of the distinction between claims and data, together with the development of a clear understanding of both, so that learners can understand how the two combine to support the proposition. Therefore, an integral part of this intervention comprised a reworked version of the Toulmin representation of argumentation

(Knudson, 1992; Yeh, 1998). Even so, this component was purposefully combined with writing components (Lunsford, 2002; McCleary, 1979).

Digital Multimodal Argument

Digital multimodal compositions with visual arguments (Howard, 2011) illustrated how other scholars engage in the social practice of argument. Newell *et al*. (2011) explained visual arguments as *'argumentative social practice mediated by multimodal uses of digital video, image, and music cultural tools' (p. 295)*. In explaining visual argument, Birdsell and Groarke (2007) presented crucial components for creating a multimodal argument theory that included, first, determining the core components of a visual image, second, recognising the settings in which images are understood, third, establishing the evenness of a visual understanding, and lastly, charting the evolution of visual perspective over time. The New London Group (1996) stressed that as our world became more technologically advanced and globalised, modes other than linguistic modes became progressively significant. In the literature on the evolving nature of literacy and argument, the visual mode has taken centre stage among the modes studied by the New London Group (1996). For instance, Kress (2003) emphasised the visual mode as *'there is a need to discuss the different conceptions of language and writing deriving from the distinction between alphabetic and image-based writing systems'* (p. 73).

Researchers such as Birdsell and Groarke (2007) and Newell *et al*. (2011) have specifically emphasised the capacity and necessity for learners to comprehend that visuals can be capitalised for argumentative objectives and to employ visuals for this goal. Instead of supporting a written or spoken argument, visual cues, for instance, colours, graphics, and PowerPoint presentations, may increasingly replace what was formerly done solely with language (Cyphert, 2007). Such a widening

definition of argument is vital for the argument to connect the visual character of day-to-day lives involving digital behaviours with rhetorical goals (Andrews, 1997; Hocks, 2003; Howard, 2011). Howard (2011) contended that the present generation of learners is the '*eye generation*,' not a part of '*Generation X*' or '*Generation Y*'. Birdsell and Groarke (2004) claimed that arguments participate in a decisive position in lives while broadening the argument definition by accounting for the myriad visual ploys without broadening the definition. It has been stated that literacy must adapt to account for the more digital, multimodal components of learners' lives to be relevant to adolescents. Multimodal arguments examined the argument's structure and how learners created it. Because of the focus on design and form, multimodal arguments include cognitive and social components when presenting a case (Alvermann, 2008, 2011).

Bezemer and Kress's (2008) social design practice has been characterised by a change in emphasis from the learner's understanding of methods and conventions to their interests and skills as designers. As a result, analysing learners' knowledge of argument form and how they present their arguments is a necessary component of teaching and researching multimodal arguments. Learners must comprehend the cognitive style of argumentation, or what Bezemer and Kress (2008) defined as the ability in a particular method to learn the appropriate message to deliver in their arguments. Additionally, they need to know how to create engaging, relevant, and meaningful arguments for their target audience by deploying semiotic resources in their social setting. Kress (2000) emphasised that in a future where multimodal design would be increasingly consequential, teaching multimodality is essential for equal participation. By engaging learners in multimodal composition, instructors teach

students communication skills relevant to their futures more than ever, according to Kress (2000).

Digital multimodal composition research related to argumentative writing is academic, and a few studies specifically address digital multimodal composition and multimodal arguments. Limited research emphasises digital argumentation, multimodality inclusion, and evaluation practices, especially in the ESL context (Demirbag & Gunel, 2014; Howell *et al.*, 2017). Whithaus (2012) explicitly used the Toulmin model to examine these findings model for argument. She observed that the model is complicated because different modes altered the argument pattern, and this model failed to consider the components of the argument beyond a linguistic mode. For instance, the Toulmin Model's claim-evidence link is predicated on the language development of the two claims and the evidence. The data was presented visually, statistically, and verbally in the examined scientific reports, although the assertion was frequently produced linguistically. *'An updated Toulmin Model of argument - one that considers multimodal in addition to linguistic claim-evidence relationships - can be valuable in this process because such a model facilitates a more detailed, even mathematical, consideration of argumentative patterns,'* wrote Whithaus (2012) in her conclusion that a more multimodal form of argument was necessary.

Whithaus (2012), in her research, presented a model of argument that relied solely on words and ignored the growing number of visual components that might have added to arguments using digital instruments. For instance, collaborative charts and graphs can be integrated to transfer visual information from a supporting or peripheral position to a more central one when building arguments (Jewitt & Kress, 2010). In their research, Demirbag and Gunel (2014) showed that learners in a science course at a Turkish Institute participated in a quasi-experimental study by having a

control group and a treatment group to see if multimodal training improved learners' argumentation and content understanding. According to their results, the treatment group that received multimodal instruction performed better than the control group in terms of their arguments' calibre and evidence of subject-matter expertise. These pieces of research implied the need for a new multimodal argumentation model (Whithaus, 2012; Stöckl & Tseronis, 2024) and that multimodal writing instruction may benefit learners' argumentative writing (Demirbag & Gunel, 2014).

Academic Essay in Digital Multimodal Blog

The primary purpose of this study is to advocate for conceiving an academic argument through different available social semiotic ways that technology has afforded in an ESL context. It is essential to mention that it does not imply that writing in higher education has less of a role or should be replaced with digital writing. However, such innovative writing has been afforded certain technological advancements to thrive in an academic context that needs to be revisited by educationists and scholars. As a pedagogy grounded in inclusivity and learner-centered design, DMC aligns with the principles of SDG-4 by democratizing access to knowledge and promoting digital literacy (Cope & Kalantzis, 2023). In an under-resourced ESL classroom, DMC aims to foster equality by providing diverse ESL learners with expressive tools suited to their cultural and linguistic realities (Walsh *et al*., 2021). An essay has been characterised by explicitness, according to Andrews (2009), and such explicit pronouncement in an essay works fine if supported by data and clearly stated ideas in an explicit, coherent way. All digital multimodal affordances help make argumentative writing an outstanding and valuable genre in an academic context.

The learners had to undergo different writing tasks during this intervention, which were informed by genre-based instructional pedagogy. This task gave them ample time to prepare for these academic writing tasks at the four principal stages of context building, modelling, joint construction, and independent construction. These steps helped learners establish academic writing skills and writing mechanics and become familiar with digital multimodal composition and Google Sites. Several class-based writing activities helped them explore several topics, and they learned argumentative writing as an academic genre. These activities scaffolded them in brainstorming and organising their ideas and helped them envision the outline of these academic arguments as clearly as possible.

It incorporated instructional affordances into a multimodal digital project to unite these scholarly ideas. Many academics have examined the essay as a genre for recontextualising understanding data from one writing genre to another in English. English (2011) suggested that this process of *'regenring'* promotes learning because it encourages reflection in the process of remaking the content. More significantly, she notes that various genres represent distinct types of knowledge and, in turn, several types of introspection. English (2011) affirms that writing academic essays allows a learner to reflect and contemplate the significance of an issue or any specific information from the existing body of knowledge. Such practice prompts learners to reflect on knowledge, as an article prompted by this. Alternatively, within genres, for instance, plays, knowledge is depicted as a process exemplified through alternative ways such as experiences, attitudes, and dialogues, leading to a distinct form of reflection (English, 2011). She coined the term *'regenreing'* to help learners make cross-disciplinary and interdisciplinary connections with those academic connections in real life. Such practices might demystify how knowledge operates across genres

and engenders an understanding of how genres shape knowledge. It appreciates and recognises how different academic genres influence how we allow learners to learn, think, and shape knowledge. The concept of *'regenring'* English (2011) refers to the affordances of using the essay as a prompt genre to convert an academic essay into a digital multimodal composition.
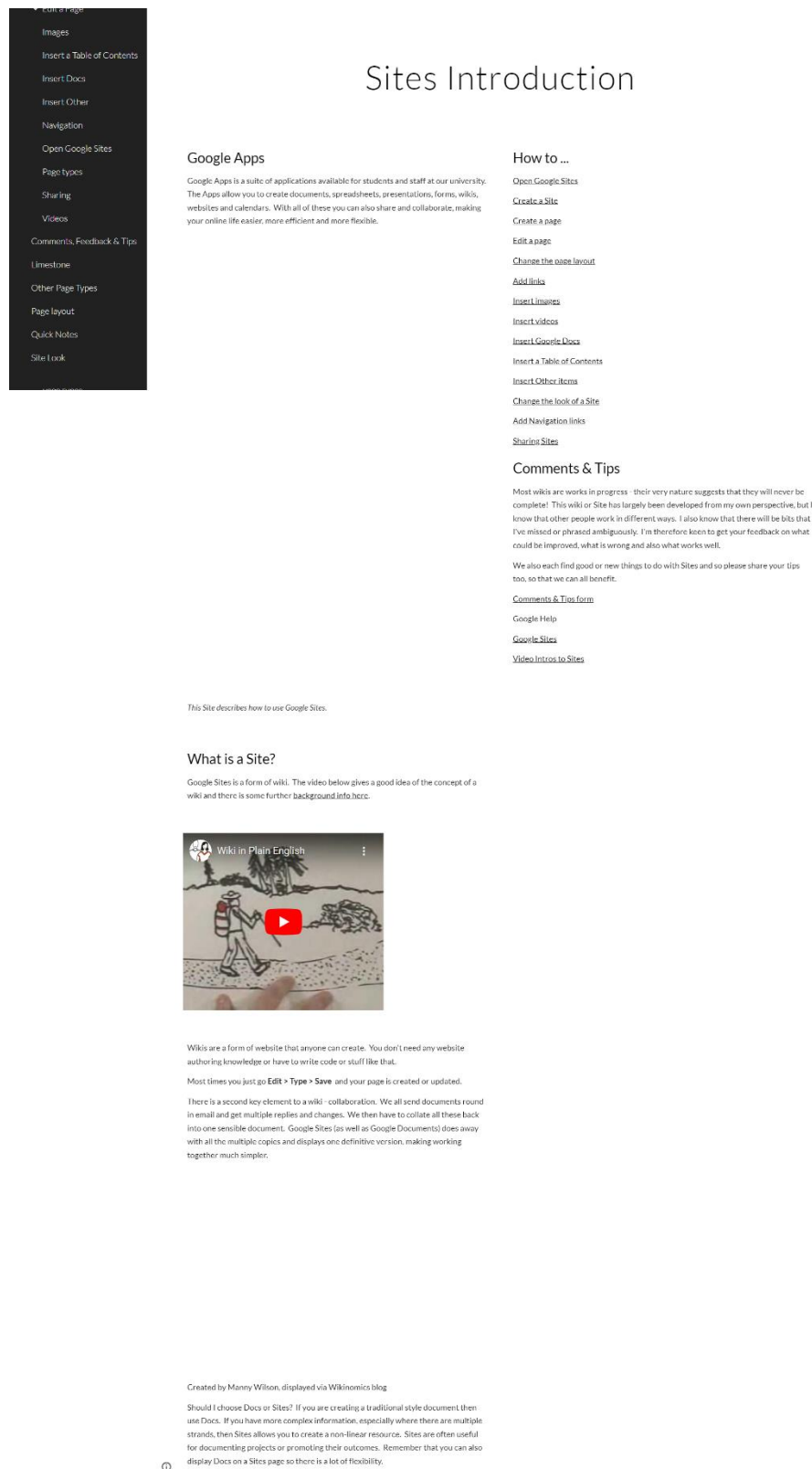
Figure 2.3: *Google Sites' Interface*

Digital Multimodal Composition Development

According to research, writers use various tools and go through an iterative process while writing; incorporating such an iterative process in writing fosters a sturdy foundation among learners (Nelms, 1994; Flower & Hayes, 1984; Applebee & Langer, 2015). *'Explicit and systematic instruction'* can be a valuable part of a writing curriculum, according to Graham and Perrin (2007, p. 320). Assistance focuses on scaffolding for writing development. Despite almost 50 years of research on process writing, no single technique or strategy has emerged as the gold standard. (Sharp, 2016). Process writing is situational. Thus, prescriptive approaches usually do not work: the theoretical underpinnings that first, writing is developmental and second, the process a writer practices during the acts of writing are supple are ignored by a *'narrow perspective towards the acts of writing'* (Sharp, 2016, p. 77). This perspective also applies to the multimodal composition process. Writing instructors are familiar with the multimodal revision process since multimodality and writing share a cyclical approach (Ball, 2006).

Additionally, the DMC procedure is collaborative and iterative. Learners use materials from many discourse groups, such as social media platforms, youth, and popular culture, to create digitally. According to the research, learners can reassemble materials to create meaning but do not always make deliberate decisions (Hull & Nelson, 2005; Jocius, 2013; Pantaleo, 2012; Ranker, 2015).

Numerous researchers have examined the relationship between writing and digital composition (Ajayi, 2015; DePalma, 2015; Howell, 2015; Howell *et al*., 2017; Lillis, 2013). De Palma (2015) administered two case studies to comprehend the repair process between different media and print-based writing. He was concerned with the transferability of print-based knowledge and abilities to other media or

modes. Relevant information was gathered from various sources, including course materials and learners' artefacts, to investigate transfer (such as storyboards, screenplays, written essays, and digital stories), transcriptions of interviews, and written reflections (DePalma, 2015). Numerous case studies have discovered that composition writers employ a variety of modes without always realising the '*moves*' they are doing (DePalma, 2015). Locating '*rhetorical moves*' demonstrated how reflection increases understanding of composers' decisions when writing (DePalma, 2015). Aspects of the transfer and process become apparent through reflection. '*Tracing*' makes the modalities of composition and traversal more visible (De Palma, 2015). The study's conclusion suggests that educators should encourage learners to actively reflect as they determine the rhetorical purposes of various resources to help them become more meta-aware (DePalma, 2015). To create meta-awareness in the composition process, composition writers can recognise changes in rhetorical aim and provide '*action-oriented descriptions*' during this process (De Palma, 2015). To give learners timely guidance and scaffolding as they discover their '*rhetorical moves,*' mapping necessitates the instructor's active participation in the process (De Palma, 2015). Finally, portfolios can help foster an environment of introspection and examine media transfer.

Fei *et al*. (2015) discovered that employing software to map multimodal texts can assist learners in learning meta-languages to describe their composition decisions. In this study, half of the instructors (n = 10) believed that using mapping software to teach literacy skills was beneficial, while the other half thought it could be helpful. The fact that mid-ability learners did not use the software's metalanguages as frequently as high-ability learners may have prompted sceptics (Fei *et al*., 2015). The investigators hypothesised that this might result from instructors not receiving enough

training in using a multimodal framework in conjunction with the software to get learners involved in multimodal analysis (Fei *et al*., 2015). Nonetheless, mapping is crucial because it enables learners to comprehend how modes interact to produce meaning and how composers leverage broader methods, such as social or cultural meanings (Fei *et al*., 2015), such as De Palma's (2015). This study emphasised the importance of focusing on compositional decisions made during writing.

Other studies also highlighted a process-based approach. Howell *et al*. (2017) used a multimodal formative experiment with the writing process as its central theme. According to this compound case, research drew close to a broader formative experiment; learners' skills did not significantly transfer from writing to multimodal composition (Howell *et al*., 2016). In addition, learners felt the extra writing task was too demanding when combined with the multimodal project. The authors speculate that the intervention's efficacy may have been hampered by their lack of experience with extended writing or their technological proficiency with the media they employed (Howell *et al*., 2016). The intervention broadened learners' understanding of argumentation, which included multimodal resources and was centred on argument writing transfer (Howell *et al*., 2017). The learners value choices because they do not often have much freedom when working on their academics.

Additional researchers emphasised the significance of comprehending how discourses (Cope & Kalantzis, 2000; Gee, 2014), modes (Kress, 2009; New London Group, 2010), and academic literacies (Cope & Kalantzis, 2000; Morrell *et al*., 2015) collaborated when creating digital content. Pantaleo (2013) discovered that Jaelyn, a middle school learner, made deliberate decisions about her compositions, including her use of colour, line, and perspective, in another case study on her writing process, deploying visual resources. The author claimed that despite learners' frequent

interaction with images, this research refuted that they lacked the skills necessary to exploit visual resources (Pantaleo, 2012). Instead, this study presented that although learners make decisions, they might not always possess the specialised language to explain them. Multimodal techniques and advanced-level visual literacy abilities should have been taught (Pantaleo, 2013; Cope & Kalantzis, 2000; De Palma, 2015; Fei *et al.*, 2015). Learners communicate daily through various media; nevertheless, technology is not the focus of the classroom. Teaching deliberate choice strengthens rhetorical awareness, which is beneficial in multiple contexts and media (Rankins-Robertson *et al.*, 2014).

Recently, think-aloud exercises and video reflections have been used to study the composition process (Pacheco *et al.*, 2021; Pacheco & Smith, 2015). Moreover, Smith and Dalton (2016) recorded learners' post-production reflections using think-aloud protocols and screen-casting software. Smith and Dalton (2016) showed that because every learner has a unique set of skills, post-process reflection can only reveal equally much about the composition process and evaluation procedures in the case of two teenage composers taken from a larger sample. Based on the novel *The Things They Carried*, each learner produced a remixed producer's cut of their composition process for an assignment (O'Brien, 2009). Although they differed in what they focused on, the two learners expanded on their composition processes using elements of video production, such as text overlays and transitions (Smith & Dalton, 2016). The variations in methods highlight how difficult it can be to use a video for assessment. Nonetheless, the study's participants engaged their identities, indicating the possibility of gaining personal understanding (Smith & Dalton, 2016).

Like previous research on multimodality, learners remixed resources to create meaning, though this is not always deliberate. It was remixing and rearranging

elements to reveal appropriation (Ryan *et al*., 2014). A focus group was held to discuss further the results of a qualitative study that detailed the remix practices of English language learners (Hafner, 2015). A similar format was followed by eighteen learners selected from twelve groups: reading, data collection, scripting, storyboarding, performing, filming, editing, and publishing (Hafner, 2015). The arrangement promoted instructor engagement at set intervals, which aided in developing the learners' language skills. Hafner (2015) distinguished between '*four different kinds of remix: chunking, layering, blending, and intercultural blending'* (p. 503). '*Intercultural blending'* describes how learners combine their voices with materials from a broader cultural context (Hafner, 2015). Each of these remix strategies constituted an iterative step in the process that used pre-existing materials. '*Typecast voice*,' or copying genres employed as models in education, was one of the restrictions (Hafner, 2015, p. 504). There were also connections with multimodality in emphasising the value of precise definitions, in this case, for a remix and suitable technical assistance for learners.

Digital Multimodal Composition is Iterative and Cooperative

Earlier reviewed research also emphasised how iterative yet cooperative the composition process is (Hafner, 2015; Smith & Dalton, 2016). For instance, Ranker (2015) used three case studies to illustrate the iterative process. There are multiple areas of interest for DMC in the survey. Not all the resources were used in the finished product, and learners constantly organised as their pieces developed. Put another way, learners frequently used more materials than were required or, as the project progressed, realised they did not need everything they had gathered in the process of necessary divergence (Ranker, 2015). Divergence indicates agency and the capacity to try various strategies and resources, including ones created by learners

(Ranker, 2015). Learners wrote with a punctuation point determined by the context, genre, or other restrictions (Kress, 2003, cited in Ranker, 2015). Involving learners in peer mentoring and digital workshop procedures is another point Dalton (2015) made; instead of depending solely on the instructor's direct instruction, a '*cascading expert model*' made room for familiarising with other kinds of technology by leveraging learners' experience (Dalton, 2014).

Additionally, Dalton (2015) suggested that learners create their texts. The claim that '*levelling up'* by deploying learner expertise allowed learners to help one another and freed the instructor to help learners with different elements of their process is significant to the research (p. 301). According to various research studies, collaboration is also represented, and socially mediated methods are used (Miller, 2013; Doerr-Stevens, 2015).

Agency in Digital Multimodal Composers

In the research, the agency takes various forms for the listener and the composer. Although learners' sense of agency is frequently linked to intentional decisions or awareness, overt instruction is required to support learners in, as he termed, *levelling up* (Dalton, 2015, p. 301). According to Pantaleo's (2013) investigation on visual literacy, experience, and instruction play a role in a person's agency and intentionality when using resources. Other research links creativity to choice and agency (Cope & Kalantzis, 2000, 2023; Hafner, 2015; Jocius, 2016; Mills, 2015; Ranker, 2015). As '*recipients*' of images, the audience actively participates in the process and shapes its meaning (Holsanova, 2012). One study on interpreting images or recreating visual reception claims that viewers' management of the allocation of visual attention was influenced by their knowledge and experience (Holsanova, 2012). Task or goals-guided visual exploration (Holsanova, 2012). Similar findings were made by eye-

tracking research in perception, which showed that guidance from an external source or prior experience could affect a reader's behaviour (Hiippala, 2012). This influence on seeing and looking behaviours is like the relationship between writing and reading. Learners who interpret images more effectively will be able to direct their viewing and write with solid rhetoric.

Discourse Communities

Employing contents from the DMC process highlights the idea of '*language-in-use*,' a linguistic term (Gee, 2014; Halliday, 1978). This idea supports how language and resources are shaped via regular use. The term '*language-in-use'* refers to actual written or spoken words, not abstract concepts (Gee, 2014); notwithstanding, as Rheingold (2012) has shown, as scholars have shown, technology has equally simplified multimodal communication. Since we construct objects in the world, create worlds, and maintain social interactions through language, this links language and resources to identity (Gee, 2014, p. 31). Our discourse communities and social languages are interconnected with visual and multimodal (Gee, 2014; Kostelnick & Hassett, 2003). Every social language capitalises on its rules (Gee, 2014) or conventions (Kostelnick & Hassett, 2003). These conventions influence our perception and understanding of the world (Kostelnick & Hassett, 2003). Additionally, we use these grammars, customs, and social languages to portray ourselves in various circumstances as a particular '*kind of person'* (Gee, 2014, p. 47). These self-performances are essential communities that give a sense of belonging through recognised social values (Goffman, 2021). Discourse communities are imperative because they convene in the classroom context. Academic and social languages, with their grammar and customs, determine the audience and the resources that learners use in multimodal composition to convey their ideas. Writing is a set of

procedures. It is a filtered, socially produced experience (Vygotsky & Cole, 1978; Wertsch, 1991). Learners can learn parts of the multimodal composition process as early as age three, much like they can acquire language (Bazalgette & Buckingham, 2013).

Discourse of Technological Determinism Surrounding Google Sites

Leaners have had chances to academic writing content using Google, and in higher education, Google has been a critical source of education, and it says that *'to refrain from using it is sometimes seen as a mark of seniority and privilege'* (Parker, 2001). Google Sites, a website-based application supported by Google, allows its users to insert images, design the layout, and insert hyperlinks on a series of panels, and allows for adding layers to their sites. Space and sequencing have been followed throughout. Contrarily, the use of Google for educational purposes (Natale *et al*., 2019) has been researched on its utility and significantly different applications that come along with Google, even though Google has revolutionised the way things work and how information is readily available on one single click, researchers have been investigating on how to make it a user-friendly interface (Thomas *et al*., 2022). Contrariwise, it has been argued that there is an element of commercialisation in Google-based applications and its focus on form over content, such as not the technology itself, but preferably the social and human conditions. Kress *et al*. (1998) highlight that technology should not be dealt with as casually, as it is a risky mistake, and draw attention to how it has been used and for which purpose. If there is such a view to be made applicable from a multimodal social semiotic perspective, then Google Sites offers the potential to design a complex multimodal practice that has different layers yet is interdependent in the design of the interface.

Multimodal social semiotic scholars have weighed different digital options (Zhao & Leeuwen, 2014). The same perspective might be added to Google Sites, yet Google Sites allows its users to explore these dimensions in greater detail and enables them to make it publicly available. These affordances were not available elsewhere in 2021. These scholars have emphasised the importance of understanding other digital platforms, such as PowerPoint, as a semiotic technology and exploring these dimensions and their relationships to the added advantage of presentation and design. This research focuses on the use of technology; in this case, Google Sites has been afforded the *Available Design* as the New London Group (1996) termed it, and how it offers conceiving an argument using Toulmin's Model of argumentation. It aims at designing, highlighting, and publishing an academic argument and how these elements contribute to the overall argument as a piece of academic writing. It is pertinent to note that for this academic writing task, the learners were expected to use visual and verbal modes primarily to restrict them from these two modes and because these learners had little or no prior experience of employing multimodal modes of communication and to avoid misconstruing certain aspects of their piece of information and also to not put them away with this *'functional load'* (Kress 2003) in this piece of information of creating their digital multimodal arguments.

Exploring new avenues of writing has been termed as '*new writing*' or '*writing in the age of screen,*' what Kress (2003) refers to as what Leeuwen (2008) terms *as 'new writing,'* or what Kress (2003) describes as *'writing in the age of screen.'* New writing is different from old writing in two ways, according to Djonov and Leeuwen (2014). First, the new writing is ruled by space primarily, and there's no fixed boundary between image and language; second, this new writing has been structured by the *'rules built into semiotic technologies such as office software,'* for

example, the autocorrect mode allows highlighting all spell check, grammatical errors, and alignments set by default.

Resources for Creating Meaning through Digital Multimodal Composition

The tools and symbols the writer leverages are resources to convey meaning. When authors construct multimodal texts, they rely upon various literacies, including their modal strengths (De Palma, 2015). The standard texts that learners read in DMC can be used in numerous ways, including through music and popular culture (Boyd, 2008). Community resources are specific to local contexts and supplement the existing tools for presenting stories (Hull & Nelson, 2005; Vasudevan *et al.*, 2010). Additionally, for disengaged learners, using social languages and services opens new avenues for interaction within the academic context (Vasudevan *et al.*, 2010).

Why Are Having Intentional Choices Essential?

Learners employ complementary styles of instruction (Hull & Nelson, 2005; Pantaleo, 2012; Ranker, 2015). Research is divided on whether learners' decisions when creating multimedia are intentional (Gunsberg, 2015; Jocius, 2016). If learners are to master or have control over rhetorical goals when using multimodal and visual languages, deliberate decisions are crucial. Strong correlations were discovered between resource assembly and Ranker (2012), who covered the process in the preceding section. Learners in his study included an intertextual interaction in drafting and drew from outside and inside classroom resources.

The learners employed discrete textual characteristics and remixed them in multimodal creations. They need to identify the many affordances and restrictions of the forms and media they work in (Ranker, 2012). The assignment required the learners to make several decisions. The message's design or organisation is influenced by the materials and delivery technique, as covered in the rhetoric section. In this

study, organisation happened as each component developed (Ranker, 2012). Additionally, he highlighted the significance of several conventional literacies in the process, including speaking, writing, using text resources, and telling stories. His study found that divergence was essential to the learner's ability to obtain and engender materials that the instructor was unable to anticipate in advance, and that learners would have more excellent opportunities if they created their own resources (Ranker, 2012).

Inclusion of Digital Modes in Academic Writing

The accessibility of digital modes of communication and their inclusion into day-to-day life is seen from the perspective of multiliteracies as increasing the significance of multimodal forms of representation in recent literature. Even so, there is a lack of robust research that fully explores the benefits of integrating multimodal forms of communication (multiliteracies) and the use of different media (multimodality) into classroom instruction. There is a need to learn about the effectiveness of incorporating diverse literacy skills and multimedia elements in teaching practices (Sewell & Denton, 2011). While much research highlights the potential of DMC in language-rich environments, limited empirical work has examined its role in the ESL context in the Global South, especially within the framework of SDG-4. This study addresses this gap by exploring how DMC can be leveraged in Pakistani EMI classrooms to promote inclusive and equitable quality education. There is no precise guideline for deploying technology in research writing other than word processing. Contrarily, research reveals that word processing is favourably connected with learner writing (Graham & Perin, 2007). In an academic writing class, incorporating digital multimodal composition and using digital tools to complete the academic goal of

argumentation will have practical educational implications and has been a critical intervention component of this study in the ESL context.

Challenges in the Inclusion of DMC in ESL Writing

Instructors who participated in a survey about multimodal teaching techniques in K-12 classrooms in the US (Choi & Yi, 2016) stated that few instructors had experience using multimodal methods in instruction, even though 23 instructors supported doing so. DMC is only occasionally used in regular classes (Early *et al*., 2015). It is usually considered only a valuable extension or a helpful intervention for high-performing and at-risk learners (Tan & Matsuda, 2020). Three significant challenges can be identified. First, the instructor's reluctance and DMC may be perceived as a diversion from exam-related learning by learners who have grown up with an exam-oriented success model (Jiang, 2018). While earlier research has demonstrated that DMC can assist instructors in meeting the diverse learning demands of learners (Hafner, 2020), how this could be implemented in actual classrooms is still unknown. Second, the absence of any institutional framework and technological support prevents educators from adopting multimodality and technology. Even schools with computer laboratories might not have the internet bandwidth and software needed for DMC (Williams & Beam, 2019). In the ESL context, instructors have been compelled to use computer laboratories for linguistic exercises instead of novel literacy techniques such as DMC due to institutional pressure to prepare learners for language-dominant, high-stakes assessments (Guichon & Cohen, 2016). Third, instructor belief is another major obstacle to instructors accepting digital and multimodal methods. Previous research has revealed that while some instructors are concerned that implementing technology may put more cognitive demands on learners than writing on paper, others are worried that learners' fundamental literacy abilities will be hampered when they use visuals as

a substitute for writing (Choi & Yi, 2016; Jiang & Ren, 2021; Williams & Beam, 2019). Some instructors exhibit a print bias attributed to their language and literacy knowledge (Miller, 2007) and consider multimodal and digital approaches '*less academic*' (Choi & Yi, 2016).

Existing Research on Integration and Evaluation of Digital Multimodal Composition in the ESL Context

In the context of ESL writing, few studies have attempted to expand the learning objectives to include multimodal writing. For example, Leeuwen (1996) and Kress (2009) gave multimodal writings a theoretical framework and urged increased focus on multimodal authoring. Each mode has unique functions (Kress, 2009; & Leeuwen, 1996), and learners must learn how to use a variety of modes to successfully express contrasting functions, according to Kress (2000). Leeuwen (2015), in response to a special issue on multimodality, advocated that future studies develop multimodal literacy evaluation criteria and focus on visual literacy in various academic areas (Leeuwen, 2015). Specific to ESL writing (Elola & Oskoz, 2017) emphasised that writing genres have altered in modern digital contexts and suggested studying multimodal genres for instruction and evaluation. Few research studies have investigated multimodal writing despite some conceptual articles presenting stimulating arguments. Limited empirical research has examined the multimodal composition of ESL writers. Contrarily, researchers working in the context of ESL have not explained why they selected the multimodal writing challenges they did.

Howell (2015) conducted an intervention-based formative experiment for her doctoral dissertation in which learners created arguments that included assertions, evidence, and the development of that evidence; they also used digital tools appropriate for constructing digital, multimodal arguments and a process approach to

writing. The intervention's objective was to raise the digital, multimodal argumentation standard. Overall, there was qualitative evidence that this intervention increased the learners' knowledge and understanding of argument while enhancing their digital, multimodal arguments. The learners thought that understanding multimodal arguments would help them write traditional arguments. Even so, there was no proof of such a transfer from the quantitative results. Even so, Ott (2016) offered a subtle consideration of formative assessment practices in his doctoral case study of primary instructors' use of video as a multimodal tool for formative assessment of multiliteracies. The produced narratives were thematically analysed using sociocultural and socio-material perspectives to understand how to interpret the results. The study's method of video inquiry may help instructors pay attention to background information and multimodal communication while shifting from memory to justification when evaluating what they observe, according to the study's findings. Steeves (2015), in his research, created an English course based on the fairytale unit, featuring learner resistance to texts from popular culture and the media through critical reading and unique text creation. The sociocultural theory of Vygotsky, the transactional theory of Rosenblatt, the feminist theory, the semiotic theory, multimodality, and multiliteracies, including media, critical, and visual literacy, were all represented in the fairytale unit. Canady (2017) responded to changes in literacy practices by considering that college and career readiness are influenced by factors other than technology; these factors included an emphasis on social and creative abilities. A formative experiment is a methodological approach that investigates how students experience the process of digital multimodal composition and supports a collaborative, iterative research process focused on an instructional aim in real-world classroom settings.

Jiang (2017), based on findings from a DMC program in China, provided a framework to demonstrate how the affordances of digital multimodal composition for ESL learners could support learners' engagement with language learning. He investigated various social, educational, and digital affordances of DMC for EFL learning. Smith (2017) examined a comparative study of adolescents' multimodal composition processes while responding to and analysing literature through integrated multimodality and multiliteracies theoretical frameworks. He instituted digital multimodal composition, a complex, dynamic, and varied process facilitated by the interaction of multiple factors. Another study in Hong Kong looked at undergraduate learners taking ESL/EFL courses and investigated their perceptions of DMC (Kohnke *et al*., 2021). Xu (2023) suggested accurately evaluating subject-specific classes and providing pedagogical guidelines for incorporating technology in the ESL/EFL setting. After examining the impact of DMC on the writing performance of Chinese ESL learners during a quasi-experimental study, implications for incorporating DMC into ESL writing instruction were put forth. This study focused on the effect of the pedagogical use of DMC in the EFL context and the impact of DMC on learners' ESL writing development.

Dalton (2012, 2014) called for a broader perspective on literacy teaching, where learners learn to use media and technology critically to make and consume text. He explained how a digital writers' workshop could be a means of incorporating multimodal writing into the classroom, Multimodal Writing and the Common Core State Standards, and how to capitalise on adaptable digital texts, resources, and media to support each learner's unique learning requirements and interests of learners (Dalton, 2012, 2014). He found multimodal composition highly engaging while iterating that the purpose for genre, writing, and audience has been considered,

together with the modes, technological instruments, and digital authoring and presentation tools at the composer's disposal. The study examined the modes that ESL writers in a first-year composition class used to create multimodal argumentative essays uploaded to the internet. The results showed that non-linguistic forms mostly illustrated the primary determinant of the possible modes. Nonetheless, learners also projected cultural and national identities and conveyed emotional attachments to their subjects' non-linguistic ways. In conclusion, the article offered recommendations for multimodal composition research and instruction (Shin & Cimasko, 2008).

Jiang & Gao (2020) examined ESL learners' modes in a first-year composition class leveraged in multimodal argumentative essays published online. The results showed that word-dominated discourse was the primary determinant of the modes chosen. Written essays were mostly illustrated using non-linguistic approaches. Contrarily, the learner also projected their cultural and national identities and expressed emotional links to their subjects via non-linguistic modalities. The presentation concluded with recommendations for multimodal composition pedagogy and research. Nichols and Johnston (2020) created a collaborative digital story using information from a humanities classroom that extensively used technology and investigated three frictions that emerged as learners worked with and against these infrastructures. The authors demonstrated how focusing on these frictions created new avenues for research and training on the covert infrastructures that constrain multimodal composition in digital settings. A critical awareness of these infrastructures could aid educators in establishing more fair learning environments for multimodal literacy.

Another article examined pre-service instructors' attitudes on including EAL learners in digital multimodal composition. They discovered that while they

understood the value of digital multimodal composition for language learners, they had trouble naming more specific literacy advantages. The article's conclusion had many ramifications for how instructors who work with language learners should be prepared (Tour & Barnes, 2022). This study reported on learners' manifestations of civic participation using learner-authored videos from a DMC program in China. Data showed that these manifestations of civic participation were made possible by the learners' inventive remixing of videos and visuals and layering of learner-generated narrations based on their genuine concerns and community experiences to facilitate their engagement in ESL curricula (Jiang, 2022).

The study proposed reassuring DMC competence inclusion into the ESL curriculum. It persuaded and advocated ESL learners to self-assess their DMC proficiency to increase their DMC proficiency. The study addressed the research gap by adopting an emic approach to examine ESL learners' DMC competence through focus group interviews, classroom observations of learner self and peer feedback, and DMC sample analysis through a qualitative inquiry (Zhang & Yu, 2023). This study contributed insights into using a multimodal analysis of two COVID-19-related videos embedded in a virtual ethnography of Chinese social media platforms; DMC investigated how video producers used multimodal techniques and meaning-making resources in DMC to enact civic participation practices during a crisis. According to the study, DMC opened new opportunities for civic engagement and digital citizenship (Jiang & Gu, 2022).

Jiang, Yu, and Zhao (2022) used Collaborative Action Research (CAR) to investigate the experiences of four English instructors implementing DMC in a university-based English curriculum in China. The results showed that the instructors had trouble making their lessons relevant, were inexperienced with digital tools, had

difficulty meeting the different writing needs of their learners, and the school system failed to acknowledge the rising burden. A professional development approach is desperately needed so that teachers can gain the skills and knowledge necessary to successfully incorporate critical digital literacies into their classes and overcome the obstacles and contradictions they face (Jiang & Gu, 2022). This research examined the multimodal compositions of learners taking an English for science course at a Hong Kong University to address some significant topics about remix culture in writing instruction. The investigation produced a theoretical model of remix techniques that might be used in English language courses to teach and assess multimodal compositions (Hafner, 2015).

Skains (2017) contended that the creative writer was unable to recognise the narrative opportunities present in the multimodal form due to their lack of precise knowledge of written narrative. In his study, he communicated the findings of a practice-based research project that looked at how the creative writer's transition to a multimodal digital composition process changed his process and understanding of narrative. It did this by analysing his works before, during, and after he developed explicit knowledge of digital fiction and digital composition tools, and it also discussed how internalising this knowledge changed the process of creating art. Jiang (2018) navigated the process of investment change in learners' writing when a DMC program was implemented in a university-based ESL curriculum in China. This study presented three patterns of change with three focal cases: first, as an active composer, second, as an exam-oriented writer, and third, as a pattern of slight change in learners' investment in English writing. The study concluded with implications for second language writing regarding ways to promote and sustain learner investment through DMC in digitalised instructional landscapes. In Chinese ESL, this study investigated a

genre-based model that considered composing elements and methods for evaluating DMC. The results led to the development of a refined genre-based model that instructs educators to assess DMC as goal-directed social acts to be constructed with appropriate multimodal choices inside and across four layers, i.e., base units, layout, navigation, and rhetoric (Jiang *et al*., 2022).

Ryu *et al*. (2022) investigated to gain a deeper understanding of the assessment and integration of memes in ESL classrooms. Twenty-seven memes made by learners were collected and analysed in a large university's low-intermediate Korean as a Foreign Language course. The results showed that the learner-created memes effectively addressed the multimodal nature of the meme genre, together with distinctive and universal cultural allusions and linguistic elements unique to the meme genre. This study investigated how English language learners create a digital storytelling project in an educational setting. Using Kress's (2003) concept of design, the researcher described how these learners approach creating multimodal digital stories, creating hybrid texts to convey their ideas, and giving meaning to the semiotic resources they employ.

Three noteworthy discoveries were made public: This study aimed to better understand the incorporation and evaluation of memes in digital storytelling. First, participants approached the creation of a hybrid text and the dialogic orchestration of multimodal materials to enable multimodal digital storytelling; the author's intent and last guided second, participants' digital story design and orchestration of multimodal resources, the study participants experienced imagination and re-imagination when assigning meaning to the ESL setting. A sizeable Korean University as a Foreign Language class collected and examined learner-made memes. The findings indicated that learner-generated memes focused on the multimodal attribute of the meme genre,

together with its recognisable and universal cultural references and linguistic qualities. Their digital storytelling employed semiotic resources. The researchers gained a thorough insight into the multimodal designers' thought processes when creating their digital tales by incorporating narratives about creating digital stories. The results of this study were examined concerning how learners used multimodal resources, illuminating the problematic process of multimodal composition (Kress, 2003), the perception of design (van Lier, 2004), and the idea of affordance (Yang, 2012).

Hafner and Ho (2020) considered the assessment of DMC tasks to be an under-researched domain, as most of the attention during the inclusion of DMC has been given to developing the task and its pedagogical implications. Therefore, their study focused on designing suitable assessment criteria, considering that mastery of several modes has been the main objective of digital multimodal composition. The study used instructor interviews to learn how they conceptualised the multimodal assessment assignment, including any practical difficulties encountered. The research suggested a process-based paradigm for evaluating digital multimodal composition, demonstrating the interactions between education, multimodal forms of communication, and evaluation processes. In the Singaporean ESL environment, Liang & Lim (2021) made the case for creating an instructional framework to teach and support learners' digital multimodal composition practices, such as making videos. The framework categorised the knowledge and abilities of digital multimodal practices into critical, creative, and technical domains. SFL theory and design thinking informed it. These findings suggested a pedagogical framework that guided learners' development and demonstration of DMC skills.

Yi *et al*. (2020) provided a pedagogical framework to instruct and support learners' digital multimodal composition practices in the classroom in the Singapore ESL environment, such as video production. The framework divided the knowledge and abilities of digital multimodal activities into the technical, creative, and critical domains and was informed by SFL theory and design thinking. These results indicated a structure for instruction that helped learners build and demonstrate DMC skills. The study highlighted the results of an empirical investigation into the multimodal composition processes of university writers (DePalma & Alexander, 2015). The findings demonstrated that learners' attempts to apply their print-based rhetorical knowledge while producing multimodal compositions were successful when they thought the print-based and multimodal composition tasks were similar. Even so, they ran into serious problems when they attempted to modify their print-based composition skills to fit novel or unfamiliar features of multimodal composition.

Jiang & Ren (2021) engaged learners with video production in a university-based English course in China, and the study revealed that instructors and learners had different, and sometimes even contrasting, ideologies over the nature of language, the role of instructors, and the legitimate evidence of learning during DMC. A framework was provided at two micro and macro levels to show how the opposing beliefs unintentionally impede learners' investment in English learning. This study systematically reviews the literature on emergent bilingual learners' DMC in secondary classrooms. It analyses the various kinds of scaffolds planned, the flexible instructional support used by instructors and learners, and how they support learning. The research revealed seven diverse types of scaffolding: conversation, encouragement, inquiry, direct instruction, translanguaging, and use of exemplar

texts. Eight scaffolding functions have also been identified that represent the three main themes of scaffolding identities, resources, and settings. The authors then explore how these findings might affect classroom instruction, translanguaging theory, social semiotics, and future research approaches (Pacheco *et al.*, 2021).

Maghsoudi *et al*. (2022) examined integrating DMC through a quasi-experimental design, aimed to investigate how different writing multimodal and monomodal styles affected English as a Foreign Language (EFL) learners' writing skills five times in terms of language, content, communicative achievement, and organisation. The findings showed that the two groups' writing skills significantly improved. In addition, the multimodal group did better in their writing skills than the monomodal group. According to the findings, writing teaching in Iran has to be revised and redefined to meet the needs and demands of learners in the twenty-first century. Silseth and Gilje (2018) examined how assessment is enacted and negotiated in a school project that involves multimodal composition based on a sociocultural perspective on learning and assessment, and the findings document the consequences of decoupling production and assessment practices.

There has been a shortage of guidance on integrating DMC across genres into language curricula, especially for expanding argumentative writing instructions (Howell, 2018). The study shed light on the attitudes and methods used by First-Year Composition (FYC) professors to include multimodal writing in the curriculum. The study concluded with additional research and professional development recommendations, having classified pedagogical agendas for teaching multimodal writing (Tan & Matsuda, 2020).

Drawing on research in digital composition, multimodal composition, and writing assessment, presenters put forth a framework for evaluation that included

three key areas: mode, audience, originality, and meaning – an *Interconnected Framework for Assessment of Digital Multimodal Composition* (McGrail *et al.*, 2021). Zhang *et al.* (2021) reviewed DMC in post-secondary ESL settings via an empirical landscape that thoroughly analysed sixty empirical ESL research studies conducted in postsecondary settings between 2005 and 2020. This article reported empirical research carried out with ESL college learners taking an ESP course in Vietnam, where they used Visme to accomplish two graphical projects, one jointly and the other individually (Li & Pham, 2022). This investigation filled the research gap by comparing the qualities of collaborative DMC products and individual DMC products and highlighted the role of infographics in writing pedagogy.

The EU-MADE4LL project stands for European Multimodal and Digital Education for Language Learning, which aimed to design and implement a syllabus. This pedagogy-oriented EU-MADE4LL Project integrated skills for the production and analytical analysis of multimodal digital texts in English for global communication that included user-generated and promotional videos, weblogs, websites, resumes, and video-based interdisciplinary projects (Sindoni *et al.*, 2019). This article analysed empirical literature on classroom evaluation of learners' multimodal compositions to characterise the field. It made recommendations for instructors and researchers (Anderson & Kachorsky, 2019) through an interpretive synthesis of the research on methods and options for judging learners' multimodal works. Results showed three significant categories of studies prevalent across the body of literature on evaluating learner multimodal compositions: changing educational practices, advancing multiliteracies learning methodologies, and assessing learners' comprehension and competency. This study examined how two instructors

with limited experience with ELLs employed and integrated multimodality into classroom practices to teach ELLs in their content area classes (Choi & Yi, 2016).

This multiliteracies-framed study aimed to examine how English Language Arts learners created digital portfolios using a variety of digital media platforms. The results showed that learners created complex, reflective, multimodal compositions that would not have been possible using the formal, prescribed forms of writing typically used in this classroom (Stewart, 2023). Lim and Polio (2020) examined the many multimodal writing assignments that undergraduate learners in US academic settings must complete. They explored the pedagogical implications of designing multimodal writing tasks for ESL academic writers based on the results and the hypothesis that undergraduate university courses across various disciplines were one target language usage domain for international learners in ESL courses in tertiary education.

Grapin and Llosa (2020) highlighted the necessity of an integrated framework to comprehend multimodal ESL writing in the subject areas by deploying the complementary nature of various fields of study. Hafner (2020) drew on the goal of balancing multimodal forms of communication with the traditional requirements of the English language curriculum in the ESL context; a case study of English language learners in Hong Kong was used to show what the approach looked such as in practice and offer suggestions for how it might be applied in various contexts. In this exploratory study, the learners' impressions of the two composing tasks were compared along with the syntactic accuracy and complexity of their writing for DMC and regular writing. Although learners had favourable opinions of DMC, there were conflicting views regarding how useful it was for enhancing writing abilities (Kim & Belcher, 2020).

Unsworth and Mills (2020) demonstrated how a multimodal writing approach intended to increase year five learners' repertoires for evaluative expression was influenced by a linguistic framework outlining resources for conveying attitudinal meanings and its extrapolation to visuals. Through professional development, together with the research team, the instructors developed their understanding of and comfort level with using digital multimodal authoring software, together with their linguistic and visual semiotic knowledge of the attitudinal expression through collaborative lesson planning and professional media artist modelling of the pedagogy in the instructors' classrooms. Results from the pre-and post-tests also demonstrated their improved understanding of complex attitude expressions and their capacity to recognise various attitudes in instances found in the text. Li (2020) studied how the learners' in-service instructors perceived the incorporation of multimodal projects. They discovered that multimodal practices aided the learners' acquisition of subject-specific information and developed their professional skills. The anticipated advantages include fostering reciprocal learning in an online community, boosting digital learning, and fostering motivation to use multimodal pedagogy (Cope & Kalantzis, 2015). They also include retaining and developing knowledge.

Cho and Kim (2021) investigated the relationship between the quality of high school learners' multimodal composition and the same learners' traditional monomodal writing and content and language alignment in a Korean context. Analytical rubrics were used to grade the task outcomes of the learners, and texts were categorised according to the content and linguistic elements that the learners extracted from the text (i.e., alignment) and the level of reflection. The quality, content, language alignment, and level of reflection in writing outcomes between learners' DMC and traditional monomodal writing did not differ significantly,

according to the findings. Dahlström (2021) addressed how learners designed multimodal digital text when making digital stories in school in this study of resources, affordances, and experiences. The results showed that creating multimodal digital texts in the classroom provided more opportunities for learners to perform and succeed in text creation. Multimodal digital texts required two digital and modal text-making skills and knowledge, and learners' prior knowledge was essential for mastering the affordances provided by the two digital and modal when creating digital stories.

Yang and Wu (2012) aimed to investigate the effects of digital storytelling (DST) on senior high school learners studying English as a foreign language in terms of their academic performance, critical thinking, and learning motivation. A pretest and post-test quasi-experimental approach was used for the one-year study, which involved learners in two English classes in the 10th grade. Results showed that DST participants outperformed lecture-type participants significantly in terms of critical thinking, learning motivation, and English achievement. The findings of the interviews demonstrated the substantial educational benefit of DST, as the two instructors and the learners attested to the fact that it improved their comprehension of the material, openness to exploration, and critical thinking skills. These elements were crucial in preparing learners for the constantly evolving 21ST Century.

Ho (2022) investigated learners' creation of a translanguaging space by engaging in digital multimodal composition (DMC) at a Hong Kong University. The study showed that producing instructional videos needed learners to use a variety of skills, such as semiotic resources, and organise them; hence, the videos displayed their theoretical and applied knowledge of multimodality in a unique, engaging, and, most importantly, effective way. This study presented the findings of an analytical

review of contemporary and pertinent multimodal pedagogy literature while

discussing the opportunities and limitations of using multimodal pedagogy in ESL

classroom settings (Cope & Kalantzis, 2015; Kustini *et al*., 2018). According to the

survey, multimodal instruction may help learners improve their language proficiency,

increase enthusiasm and involvement in class, and build critical awareness skills.

Multimodal Digital Classroom Assessments (MDCAs) are examined in this

study as a subset of classroom assessments. The research reviewed three examples of

MDCAs created in conjunction with practitioners as part of a formative experiment,

combining multimodal perspectives with performance assessment theory and

analysing their affordances and potential utility for practice (Fjørtoft, 2020). Even so,

implementing MDCAs required continuous attention to validity, literacy

requirements, and the administration of some MDCAs' longitudinal nature. Therefore,

design procedures should consider how evidence from MDCAs complements

traditional assessment approaches to present a relevant picture of learner learning.

This study examined English language learners' multiliteracies in designing

multimodal texts and studied how English language learners functioned as designers

to generate meaning via multiple semiotic resources in multimodal text production.

The New London Group's (1996) multiliteracies pedagogy served as the foundation

for the framework of multimodal analysis created in this study, and the specific

analytical criteria employed in this work were adopted from the (Cope & Kalantzis,

2000) model of multimodal design. Investigating the learners' multimodal text

creation patterns is hoped to uncover implications for multiliteracies pedagogy (Chiu

& Hung, 2011).

Callow (2018) summarised the results of a study that investigated methods for

evaluating how efficiently young learners understood the textual and visual text in

picture books. The assessment tasks were individual interviews focused on visual metalanguage and informed by functional semiotics and multimodal theory. The findings were examined in terms of how efficiently the questions and assessment methods worked, how to interpret the students' replies, and how to use them in the classroom to help instructors gauge the multimodal knowledge of their learners.

Kustini *et al*. (2020) targeted the synthesis and evaluation of empirical studies that have already been conducted on multimodal pedagogy in EFL classroom settings. After analysing a corpus of forty studies, the results showed that case studies carried out in school settings with both instructors and learners as participants were the most popular study design for multimodal research. Yi and Angay-Crowder's (2016) research described how the authors created and used two multimodal approaches in American preservice and in-service instructor education programs by integrating multimodal pedagogies for instructor education in TESOL (Cope & Kalantzis, 2015). The essay emphasised the difficulties in implementing multimodal approaches in instructor preparation.

Since literacy is evolving, it is vital to create new assessment forms to assist learners' new literacy practices in the digital age (Hung *et al*., 2013). This study investigated how the design rubric, used as a formative assessment tool, affects the multimodal text production of English language learners. According to the empirical findings of this study, the theory-driven design rubric helped learners better comprehend and be aware of the multimodal nature of presentation slides and improved their ability to produce multimodal texts.

The teaching of multiple literacies is supported by including multimodality in the English curriculum. For the whole development of learners, a single literacy mode, such as print text, should no longer be emphasised in the classroom. Jewitt

(2008) warns instructors against the possibility of a '*breakdown*' of knowledge when learners are required to interpret ideas from various sources and points out that using different modes in the classroom offers both possibilities and restrictions for learners' learning (p. 258). When addressing a new idea, learners draw on their prior knowledge; thus, if learners (or instructors) favour one mode over another, it may hinder their capacity to understand the material presented in a unique style or context. Additionally, different modes offer diverse opportunities for learning by requiring different devices for distinct types of learners and communicating knowledge in specific ways (Jewitt, 2013). For instance, an idea gained from reading a text in print would be understood when presented visually, such as in a movie. Some learners may benefit more from reading or portraying information through images, while others may find acquiring knowledge or understanding through sound more straightforward.

Kress (2010, 2000) explores what it means to convert to a new conceptual model of communication that uses more than the form of the printed word. He was a prominent member of the New London Group (1996), which first drafted concepts such as multiliteracies. This proposal is in reaction to complaints that multimodality undermines composition programs by demeaning the written word and causing learners' ability to write tremendous damage. While addressing Wootten's concerns about the inherent multimodality of text, Kress emphasised the need for an even more in-depth understanding of the materiality of multimodal documents by asserting that '*communication is always and inevitably multimodal*' and that cultural contexts shape the primary modes of communication and are therefore open to change. The articles in this issue have been chosen to showcase how multimodality has been applied to develop research methods and theoretical insights into today's digital landscape. They aim to explore methodological innovation, highlight future directions, and engage

with the inherent tensions involved in incorporating multimodality into the study of human society (Flewitt *et al*., 2019).

Evaluating Multimodality in the ESL Context

Multimodal evaluation is a newly developed idea in multiliteracies (Kalantzis *et al*., 2003; Kress, 2003; Kress & Leeuwen, 2006; New London Group, 1996). It has as yet discussed the capabilities of several modalities (Cope & Kalantzis, 2009; Kress, 2000) and shifting from theoretical deliberations on process versus standardised evaluation to the challenges of evaluating multimodal work (Kalantzis *et al*., 2003), the valuing of '*linguistic competencies*' (Jewitt, 2005; Towndrow *et al*., 2013), and multimodal design assessment (Kress, 2003, p. 200; Kress & Leeuwen, 2006; Towndrow *et al*., 2013) to issues with the same practice that are examined in these case studies (Hung *et al*., 2013; Newfield *et al*., 2003; Towndrow *et al*., 2013). These researchers have focused primarily on curriculum design (Jewitt, 2008, p. 200). Furthermore, the assessment of multimodal work prioritises learner outputs. It is possible to evaluate multimodal work in a monomodal way through reflection and written observations based on learner activity recollections (Jewitt, 2008). The work of Kress (2000) and Towndrow *et al*. (2013) indicated an alternative approach: the instructor's assessment praxis or their comprehension of the advantages of both multimodal and non-print assessment affordances for conceptualising learners' accomplishment. Towndrow and associates (2013) ascertain a need for instructors to obtain semiotic awareness. This research contends that there is a need for additional theoretical and empirical research on instructors' use of multimodal assessment and, for this purpose, on assessment types that include visual or audiovisual.

With the evolution of the definition of multimodality, the curriculum was adapted to the digital technology that is available in the present day. Contrarily, a

challenge in encouraging multimodal texts was the assessment of multimodal genres and encouragement to produce multimodal texts with digital technology that some instructors were not familiarise with (Lee, 2023). As noted by Khadka and Lee, the situation has created an uneasy gap between practice and theory and between learners' preferred literary procedures and tangible instruction in writing classrooms. Multiple studies into learner literacy practices have found that our learners write more than ever, with various composition technologies and forums widely available. Still, our instruction's primary focus and medium remain traditional print. Learners are continuously finding new ways to express themselves through composition and contributing to the ever-evolving topic of what composition and multimodality consist of. As the understanding of multimodality changes with technological advancements, instructors are held to a standard to constantly update their courses by including new genres in composition. The primary way for instructors to learn and adapt to their curriculum is through their subjective experiences, such as communicating with their colleagues and working directly with the needs and feedback of their learners. Most writing instructors find that assessing the multimodal texts their learners create, which are naturally different, is one of their biggest challenges. This research investigates what undergraduate writing instructors are. It should be valued in multimodal compositions in response to appeals from academics, such as Yancey, Herrington, and Moran, for study on multimodal evaluation in situated classroom practice. We may connect our multimodal assessment theories and practices more effectively to facilitate effective instruction and assessment of multimodal writing by looking into what theorists and practitioners value in new media texts. This study brings together theory and practice to guide writing instructors in navigating the challenges of multimodal assessment.

The design-based assessment model provides a flexible, theoretically grounded approach to multimodal assessment that aligns with what this study identifies as writing instructors' core values in evaluating students' new media texts. Initially inspired by an analysis of multimodal assessment scholarship, this model was further validated by examining assignment sheets and interviews. This design-based paradigm integrates three primary theoretical strands: rhetoric, composition, multiliteracies, and new media, notably influencing multimodal assessment. It highlights the value of recognising students' context-based composition processes and demonstrates how multimodality can enhance writers' awareness of their agency and metacognitive skills. A design-based approach to multimodal assessment also emphasises materially responsive composition practices, exposing learners to modern composition tools and graphic design concepts without excessively emphasising any single element. (Baldwin, 2016).

Developing a Digital Multimodal Composition Evaluation Design

Instructors continue to assess DMC using print-based literacy standards, failing to adequately account for the unique advantages of multimodal compositions (Jacobs, 2013). Evaluations prioritising print-based materials cannot quantify success in digital practices or approximate learning through digital media literacy (Mills, 2010). According to Mills (2010, p. 262), conventional Evaluations lack '*life validity*' and do not reflect learners' digital behaviours, making them disconnected from their outside-of-class digital practices. It takes more than a writing focus to create evaluations for varied learner DMCs that reflect social media use and rhetorical aims. Multiple means of meaning-making must also be included. The following conversation examines several methods for digital writing and DMC evaluations, including rubrics, frameworks, and reflection.

Illustrating Learning Through Composition Practices

It is critical to consider how evaluation and instruction work in tandem. This relationship supports constructivism and promotes experimentation in both classrooms and classroom instructors. Charlton (2014) suggested that instructors must be ready to try innovative approaches with Evaluation if they want their learners to experiment with genre. More DMC research will contribute to understanding how learning manifests itself in and through DMC. Till then, instruction and evaluation in the classroom must be particularly attentive to the requirements of the learners. Writing as a DMC supplement could take away from the lessons learners gain during the DMC process. Instructors often offer writing in addition to multimodal composition because they are concerned about their learners' academic progress. According to Howell *et al*. (2017), learners can consider a lengthy writing assignment '*overcomplicated*' and '*redundant*' in a formative experiment study on digital multimodal composition and argument writing. Research revealed that instructors' adoption of this technique may have been a sign that their worries about meeting standards conflicted with their desire to use multimodality. The researchers warn that learners do not always successfully transfer writing skills and multimodality. According to Donahue's (2012) research, learners require enough time to acquire skills they may be assigned later.

Moreover, '*person-context interactions and how knowledge is presented in new situations*' contributed to the social transfer process. The social component of learning emphasises the value of explicit instruction in various modalities and provides many opportunities for learners to engage with the subject matter and one another. The final and most fascinating point was that analogy is the best tool for transmission (Donahue, 2012). From what has been discussed thus far, if instructors

can create learning experiences that strengthen significant connections, then DMC learning transfer between other modalities is possible. DMC learning transfer across modes can assist instructors in creating summative and formative evaluations, mainly when assessing DMC.

Rubrics and Frameworks for Evaluation

Rubrics and frameworks are helpful manuals for teaching and evaluating. Hicks (2015) uses the idea of *'looking closely'* at learner work from the National Writing Project (NWP). *'Looking closely'* provides a non-evaluative framework for conversations on learner work (Hicks, 2015). The *'looking closely'* procedure has been around for a while and is effectively applied to examining learner writing. This protocol made room for significant queries that advance our understanding of digital texts (Hicks, 2015). Another framework modified by Hicks (2009) is the MMAPS heuristic: Mode, Media, Audience, Purpose, and Situation for the writer and the writing. Because MMAPS and *'looking closely'* have obvious rhetorical linkages, they are invitations to engage with work by learners in ways that writing instructors are already acquainted with. Furthermore, frameworks offer helpful support for multimodal teaching and learning. Using a heuristic, for instance, MMAPS makes it easier to interact with an extensive range of digital genres (Hicks, 2009).

The Multimodal Assessment Project (MAP) Group from the NWP created a framework to match the assessment languages used by digital composition writers (Eidman-Aadahl *et al*., 2013): *'(1) artefact; (2) context; (3) substance; (4) process management and technique; and (5) habits of mind'* are the domains or places that the MAP Group designed where multimodal composers engage during the composition process (Eidman-Aadahl *et al*., 2013). Since this domain captures a particularly challenging component of multimodal evaluation, it is quoted in its entirety. A crucial

aspect of this field encourages writers and readers to think about the material and rhetorical linkages between multimodalities. The domain's emphasis on believability and aesthetics is connected to the rhetorical devices of pathos and ethos. The language used in the area, including ideas and performance, clearly follows the rhetorical canons. These concern the conventional guidelines for organising and presenting digital multimodal compositions. Arrangement corresponds with drafting and rewriting in the writing process, which composition educators are more familiar with and in tune with. Delivery also refers to the publishing or performance stage in front of an audience.

Evaluation of DMC through Rubrics

Rubrics are frequently used to help with assessment, relieve instructors' consistency and workload strain, and offer consistency in various scenarios (Burnett *et al*., 2014). Using an ecological model or considering assessment procedures as essential to the overall digital composition process was one strategy for implementing rubrics across the curriculum (Burnett *et al*., 2014). Learners used the rubric to assist with various stages of the writing process, such as creativity or brainstorming, and to publish the finished product (Burnett *et al*., 2014). Rubrics should include examples of what makes a DMC effective (Ball, 2012). Ball (2006) published a piece discussing the drawbacks of multimodality rubrics. The main point of contention in the criticism was how frequently context and rhetorical meaning were absent. Until then, the claim was that no relevant rubric connected the *'text'* to the audience (Ball, 2006). Using the rubrics for multimodality from (Kress & Leeuwen, 2001), although they were helpful, she contended that they were more *'designerly'* in nature and ineffective for teaching text analysis or *'readerly'* parts of texts. Later, Ball (2014) would use what is known as 'editorial pedagogy,' or instruction that approximates actual writing processes that

produce publishable products by using the standard '*revise and resubmit*' approach in design (p. 92). This change was justified by the idea that a producer or writer must be able to view their work '*editorially*' or for a '*usable audience.*' Publication, therefore, can be helpful in the classroom as it adds a professional touch that has the potential to develop learners' agency.

Evaluation through Reflection for Assessment in DMC

In DMC, reflection has been used as an evaluation instrument to highlight the composer's intentions (Ball *et al*., 2013; Neal, 2011; Shipka, 2009) and as an independent genre (Miller, 2013; Smith & Dalton, 2016; Yancey, 2016). A composer can investigate learning in a space created by written reflection. Shipka (2009) suggests three questions to promote learner reflection: *'(1) identify the strengths, weaknesses, and areas for revision in their texts; (2) share their thoughts and feelings with readers; and (3) articulate the lessons they learned'* (p. 356). To articulate learning, one must consider both academic and personal development (Shipka, 2009). Reflection is a reflective process that involves looking back. In DMC reflection, writing is not the only technique employed.

Multimodal writing might replace other assessment methods as preferred. (Cope *et al*., 2011). The social aspect of knowledge generation is consistent with a writing culture (Cope *et al*., 2011). The consequences of writing and DMC-centred evaluations imply that altering instructors' perspectives regarding writing would affect classroom dynamics, curriculum development, and evaluation. Assessment that considers social learning also reflects how multimodal professionals operate outside educational institutions (Rowsell, 2013). Professionals' actions were found to mirror the claims made by Cope and Kalantzis (2013) for a more inclusive understanding of social formation in their thorough ethnography, which comprised thirty case studies.

The six components that experts in the field of multimodality taught us were: first, affinities and interests were usually passions from childhood on; second, all modes revolved around storytelling; third, cooperation was essential; fourth, originality is not a prerequisite for creativity all resources are remixed; fifth, conventions are teachable; sixth, one human endeavour in which composers have agency is multimodality, over the telling of stories (Rowsell, 2013). These six conclusions are consistent with the research and theories covered in this literature evaluation. They are, therefore, not exclusive to professionals.

Genre-Based Writing Instructions of Argumentation in ESL

The notion of the genre has been variously defined by many researchers (e.g., The definition can be summarised by saying that genre is a communicative process that bargains meanings to accomplish goals in social circumstances. Researchers have endorsed genre-based methods since it is advantageous for learners to read various written materials. Different writing styles or genres, such as legal briefs, letters of apology, or recipes, are created and employed to accomplish multiple goals through a specific grammatical focus (Badger & White, 2000). Writing instruction based on genre authorises learners to comprehend the target texts' organisation and the reasons behind their writing styles (Hyland, 2007). Previous empirical research has documented the benefits of genre-based writing instruction (e.g., Hyon, 2001; Yasuda, 2011; Zhang & Zhang, 2021). For instance, Hyon (2001) interviewed eight adult non-native speakers in their tertiary education who had attended a genre-based reading course to report on the long-term impact of an English for Academic Purposes (EAP) genre-based intervention. She disclosed that some learners' ESL reading and writing in Korea were positively impacted by genre knowledge acquired through explicit instruction.

Moreover, the learners expressed satisfaction with the instruction and became more self-assured. Despite the numerous studies highlighting the benefits of genre instruction (Hyland, 2002, 2003; Swales, 1995; Tang *et al*., 2022; Yasuda, 2011), concerns remain. Freedman (as cited in Hyon, 2001) highlighted the potential risk of explicit genre training when instructors lack knowledge of the target literature. Others pointed out how having learners rely, ergo, mainly on the instructor's selection of model texts and explicit instruction of genres limits their ability to think creatively, resulting in passive learners (Badger & White, 2000). Hyland (2002) asserted that applying genre knowledge to a specific audience, communicative goal, and social context is far more crucial than simply understanding how to construct grammatically sound sentences.

Writing education focused on the genre may support ESL writing proficiency, provided it is thoughtfully planned and efficiently designed. The body of research on argumentation showed that ESL learners have few techniques for expressing their opinions and presenting their cases. The limited writing skills used by ESL learners significantly impact their exam results and potential scholarship. This urgent problem must be solved since university ESL learners must write in an academic setting with a clear, cohesive, and orderly argument (Zhang, 2021). According to the body of research on argumentation, ESL learners lacked a variety of techniques for expressing their opinions and establishing their cases. The limited tactics used by ESL learners have a significant impact on both their writing exam performance and future scholarship. The necessity for university-level ESL learners to write academically with a clear, cohesive, and efficiently organised thesis necessitates addressing this urgent problem.
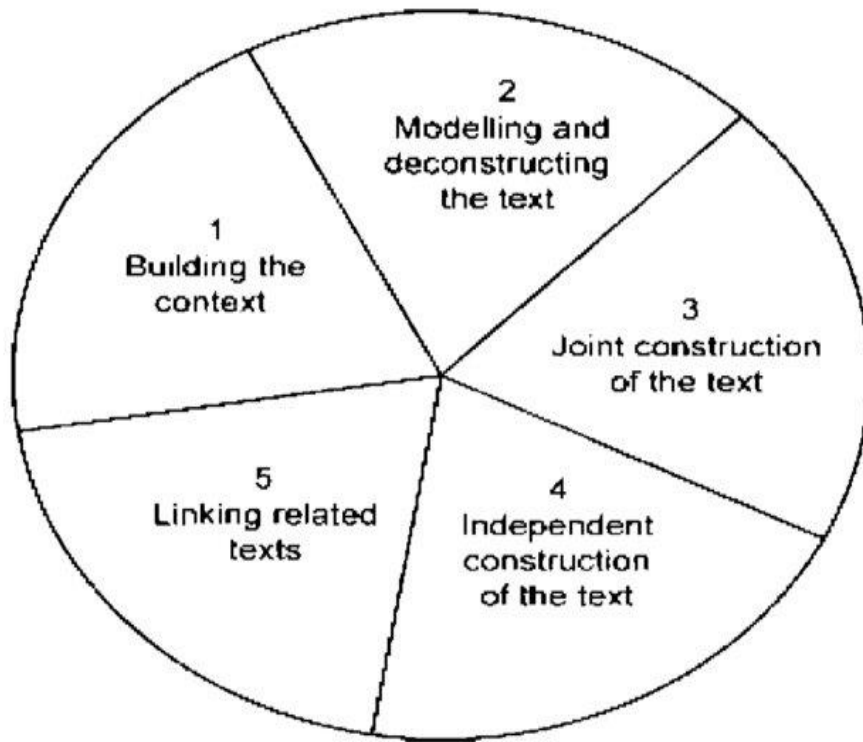
Figure 2.4: *Stages of Teaching and Learning Cycle (Feez and Joyce,1998)*

Genre Pedagogy by Hyland

This study's main topic was genre pedagogy and explicit or visible pedagogy (Hyland, 2003). The instructor's job in this context is to assist learners in learning by being aware of target genres and making explicit, deliberate language choices. The aim of text and language use concerning a cultural setting (genre) and a situational context is explained to learners (mode, tenor, and field). Instructors may urge learners to dissect exemplar texts to understand the text's general structure and linguistic elements. Teaching communicative languages is one of the additional communicative activities (Burns, 2001) that may be used to construct portfolios of learners' genre writing and to promote reflection on writing techniques that include genre pedagogy (Paltridge, 2001). The cycle of instruction and learning is the name given to the primary teaching and learning process in a classroom. Four phases engage in text construction: constructing field knowledge, modelling the text, co-constructing the text, and independently creating the text. When gaining an understanding of the field stage,

learners are exposed to conversations or exercises that encourage awareness of the situational and cultural context of the genre being studied by the learners.

In the second stage, modelling of text, the focus is on text analysis, which draws learners to pay close attention to the general (schematic) structure, linguistic characteristics, and purpose of writing. In the third stage, joint construction, the instructor and the learners co-construct a text. The instructor serves as a scribe, recording the learner's contributions on a board. To make sentences from learners more genre-appropriate, the instructor might need to reword them. When learners feel secure enough, they transition into the last stage of independent construction, which requires them to write independently.

The instructor establishes the goal and social contexts for which the target text is used during the first phase. The instructor introduces tasks to practice the language features during the second stage, during which she gives illustrative target texts and examines the essential genre structures and linguistic features. The third stage involves the learner drafting a target text as the instructor or other learner models the writing process steps. The fourth step requires the learner to produce texts on their own, independently. In the final stage, the target gauge is compared to other situations or genres with the same problem. The cycle of teaching and learning (Feez, 1999), genre-based pedagogy is underpinned by the belief that explicit instruction enables learning to be best accomplished (Feez & Joyce, 1995; Feez, 2007; Hyland, 2002). Genre pedagogy has been effectively applied in ESL writing contexts (Wardani *et al*., 2021). Moreover, the Reading-to-Learn (R2L) strategy for fostering coherence in argumentative writing was used with English Language Learners (ELLs) from Pakistan who were undergraduate learners. According to these findings, genre

pedagogy is an effective teaching strategy to enhance writing instruction and learning at Pakistan's postsecondary level (Asghar & Janjua, 2020).

Studies have revealed that for learners to become more adept ESL users, ESL writing should be specifically taught. Genre-based writing instruction could be implemented in English classrooms to help learners become more proficient writers (Dreyfus *et al*., 2016; Flowerdew, 2002). Hiippala studied the multimodal artefacts, and his research was based on the framework of genre and multimodality that he termed as *'GeM'* (Hiippala, 2017); in the ESL context, there is a need to conduct such a study based on language learners' multimodal artefacts developed in a writing class as the learners are already investigating '*what else is possible*' in these writing spaces for new media. The GeM framework is relevant to Pakistani context, where students are often unfamiliar with digital layout conventions. By emphasizing coherence, reading paths, and visual hierarchy, GeM scaffolds learners' construction of structured multimodal arguments and facilitates their transition from print-centric writing to digital communication. The evolving pedagogies, writing program structures, and learner writing styles examined in multimodal literacies and emerging genres recognise that new media and new genres are not achieved utopia but instead learning spaces that allow success and failure, disagreement, and agreement to coexist (Askehave & Ellerup, 2005; Bowen & Whithaus, 2013).

Using the theoretical framework of the Swalesian notion of genre, which is employed to investigate the connection between discourse and social activity and to instruct language and communication learners on genre norms in academic settings worldwide, learners, the goal of this research is to account for the genre characteristics of nonlinear, multimodal, web-mediated texts. The essay addresses the attributes of digital genres, particularly the media limitations that significantly

influence the creation and consumption of digital genres, and it proposes an expansion of the Swalesian genre model that considers digital attributes. The observation is only made on a small selection of business websites. The cycle of genre-pedagogy instructions based on Hyland is an iterative process, and there is no clear-cut demarcation where one stage ends and the next starts. Preferably, these stages overlap, as suggested by Derewianka and Jones (2023), which returns to the phase of *'building the field'* of knowledge and language throughout a unit of work that is also illustrated in Figure 2.4, the cycle that genre-pedagogy entails a cyclic ongoing process.
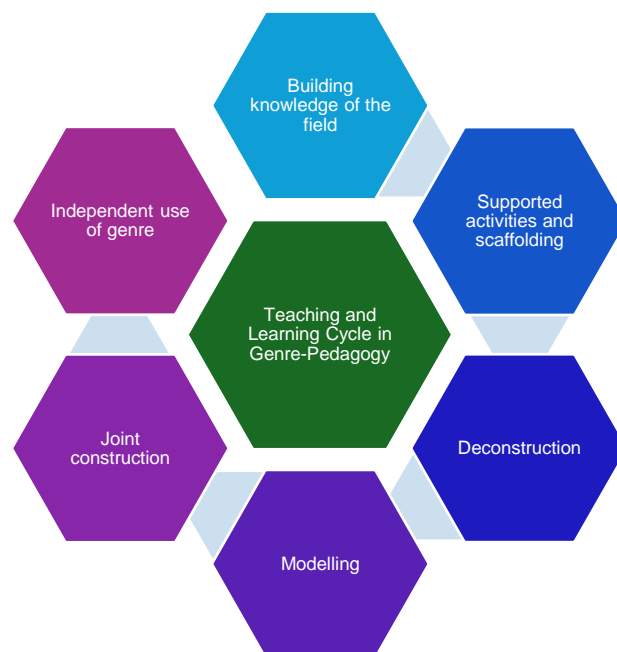
Figure 2.5: *Genre Pedagogy Teaching and Learning Cycle Adapted from Derewianka, B. & Jones, P. (2023)*

The Genre-Based Pedagogy Cycle

The learning cycle was created and divided into four stages using genre-based pedagogy: independent construction, joint construction, and deconstruction (preparation and modelling).
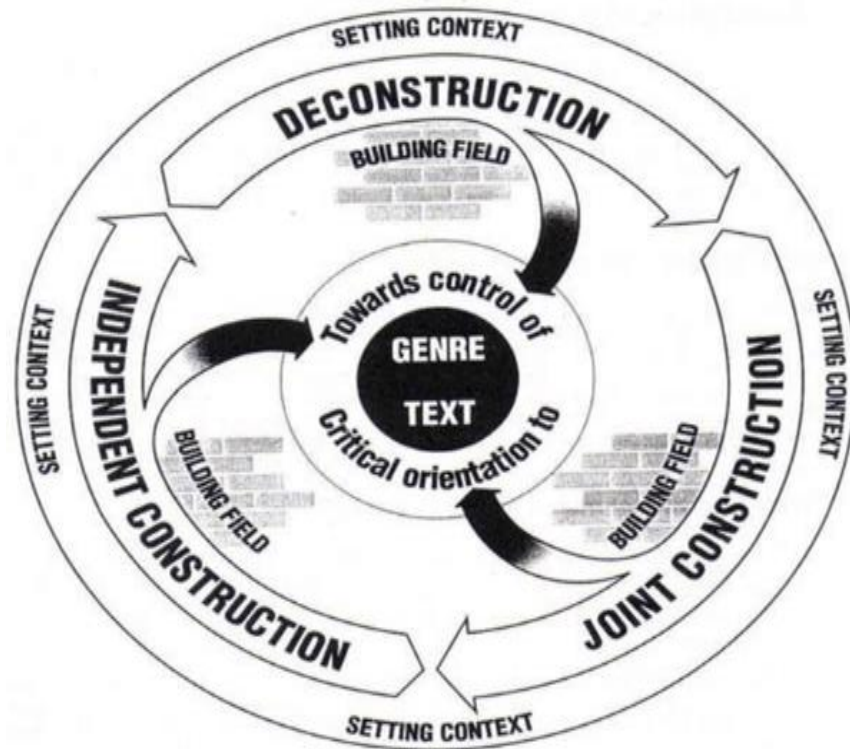
Figure 2.6: *The Cycle of Genre Pedagogy (Hyland, 2007)*

Building Knowledge of the Field. When applying genre-based education, the learning process starts with creating context. Learners are permitted to encounter and investigate cultural and contextual elements of the intended text's social context at this level (Nurlaelawati & Novianti, 2017). As a result, learners will be conversant with the genre's subject, vocabulary, and grammar (Derewianka, 2003). For this reason, learners already possess a fundamental knowledge of the many genres in the book and know how genres are employed in various contexts and cultures.

Modelling of Text. Learners are exposed to a sample text focusing on one genre at this stage. It aims to improve learners' comprehension of the genre's language and structural attributes in genre texts. Furthermore, learners pick up grammar lessons from the model text (personal pronouns, present tense, etc.) (Hyland, 2003). As a result, at this point, the task usually entails reading and analysing the book in addition to the instructor-provided model text.

Joint Construction. Learners collaboratively create at this stage when they collaborate with their instructors to build a text following the genre they previously studied (Derewianka, 2003). This stage facilitates the learner in creating their digital multimodal compositions with various genre objectives. Consequently, the learner feels prepared to write their texts near the end of their education.

Independent Construction. Learners who are prepared to draft, revise, and edit their texts individually and independently construct their digital multimodal compositions (Gebhard & Harman, 2011). Besides, learners investigate how the knowledge gained relates to various genres and contexts. As a result, learners create texts by genre and the genre's social role.

Mapping the Genre for Multimodal Artefact Following the GeM Framework

Analysis based on the GeM scheme yields multiple distinct descriptions, one for each layer. Given these factors, we can analyse if consistent patterns of co-selection across the layers can be found (Delin *et al*., 2002). If patterns of co-selection are identified, it suggests that independent choices are limited to prevent or control choice. One is an expanded concept of the multimodal genre that includes elements of the historically situated creation and use of artefacts (Bateman, 2008; Kress & Leeuwen, 2001). Another factor is the presence of unique semiotic modes that use specific expressive elements to achieve communication objectives.

A wide variety of semiotic modes are yet to be explored, each with its unique potential for creating meaning and its own distinctive *'logic'* (Kress, 2003). In this context, if we focus on genre mapping, multimodal genres are used to identify empirically based characteristics of their *'generic'* properties. It is recommended that further consideration be given to adopting a functional genre interpretation. The multimodal genres are more than just sets of formal patterns. These patterns are

chosen to fulfil the specific social functions needed for the genre. In well-established genres, the forms of expression are tailored to their purposes. However, this may not be the case in newer, manufactured genres. All design and re-purposing efforts need to fully understand the altered genre and the semiotic possibilities of the original and new delivery methods. This includes understanding which genres each method can accommodate and their potential impact.

To empirically explore the semiotic space of multimodal genres, we needed to set up initial layers of description for the data of the multimodal artefacts to be analysed, to compare and characterise them. Throughout its existence, the GeM project aimed to define description layers and formally specify them in a corpus-driven linguistic analysis (Bateman *et al.,* 2007). Such a corpus allows researchers to analyse data on multilayered levels, as suggested by the GeM model, by illustrating annotations according to several independent descriptions. Multimodal genres have been identified based on consistent co-selection patterns from independent descriptions for generalisations. If patterns of co-selection are identified, it suggests that choices that are supposed to be independent are limited or restricted by other factors. The controlling variable in such cases is found in the concept of genre.

Qualitative and quantitative research on consistent features and patterns of multimodal genres has eased such an analysis. For the current study, GeM as a framework has been applied manually to access multimodal data because this data is generated in an academic context derived from the argumentative and rhetorical discourse structures that hold multimodal artefacts together. The choice of description layers is informed by linguistic tradition, document production, and design principles. We use functional linguistic theories of genre, specifically Martins and Lemke's generalisations, to consider genre spaces and their social interpretation. Genres prove

how various symbols and signs combine to achieve common, familiar societal

objectives (Bateman *et al*., 2007). The description layers are influenced by linguistic

tradition and document production and design practices. This leads to two

fundamental areas:

   I.   Features related to the characteristics of the document being analysed:

  II.   The features describe aspects of the document's production/consumption

         conditions.

Table 2.2: *Layers of Genre and Multimodal Framework for a Page-based Artefact*
(Bateman, 2008)

1. Base Structure	*The way the information is structured for communication.*
2. Rhetorical Structure	*How content elements are presented and argued using Toulmin's Model;*
3. Layout Structure	*The appearance and placement of communicative elements on the page.*
4. Navigation Structure	*How the intended modes of consumption of the document are supported;*

Bateman (2009) proposes that document genre is defined by levels of

description and constraints on information at each level when creating a document.

Document design is driven by the need to meet communicative aims at the five levels

described while accommodating various potentially conflicting and overlapping

constraints. The GeM model recognises the factors that change the creation of

multimodal artefacts, as Bateman (2008) outlined. The material substrate's fold

geometry and physical qualities define canvas constraints, while production

constraints encompass the technological aspects of production. The production

constraints in this research allow for a historical context of learners-generated digital

multimodal compositions using the Google Sites interface as a means of production.

The introduction of desktop publishing has had the most significant impact on production. DTP, or computer-assisted graphic design, drops the requirement to create physical blogposts before production. This enables the exploration of different semiotic modes within a digital setting. Digital printing technology has made high-quality colour images previously limited by technology and production costs (Bateman, 2008). The second area, which closely follows Waller's (1987) work, is:

Table 2.3: *Constraints in Genre and Multimodal (GeM) Framework for a Page-based Artefact (Bateman, 2008)*

Canvas constraints	*Constraints related to the physical characteristics of the object being produced: paper or screen size;*
Production constraints	*Constraints related to the production technology: limit on page numbers, colours, size of included graphics, availability of images;*
Consumption constraints	*Constraints related to the place, manner, and time of acquiring and consuming the document, like the method of selection at the purchase web browser sophistication, and the changes it will make on downloading; also, constraints arising out of the degree to which the document must be easy to understand, read, or otherwise use.*
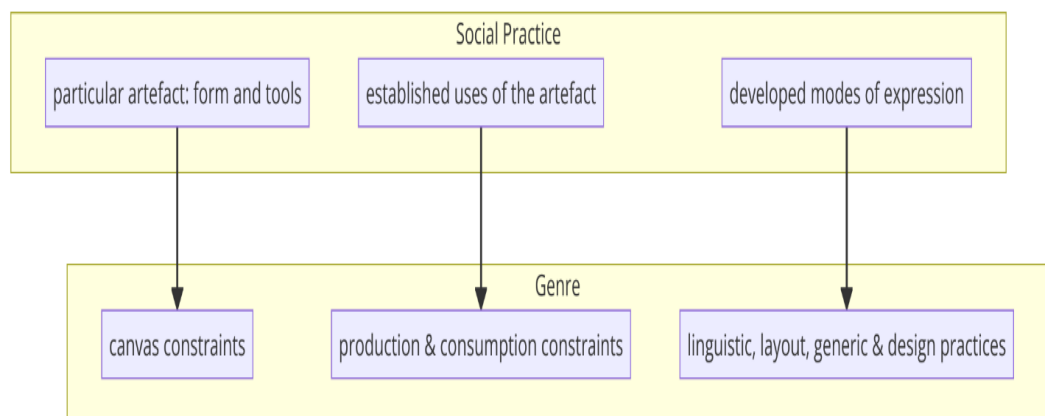
Figure 2.7: *GeM Framework Indicating Constraints*

Semiotic Modes Used in the GeM Framework – Text-Flow, Page-Flow, and
        Image-Flow

The semiotic modes of text-flow, image-flow, and page-flow serve as abstractions for explaining multimodal phenomena observed in the data. Bateman (2008) proposes that semiotic modes offer insights into how various semiotic resources are combined within multimodal artefacts. Yet, given their shared foundation in the visually perceived two-dimensional space of a page or screen, establishing a complete and definitive list of semiotic resources in these contexts is challenging. To address this, Hiippala (2014), along with Bateman (2008, 2009, 2016) and Bateman *et al.* (2017), advocate for a more nuanced and empirically grounded concept of semiotic mode, hypothesising three distinct semiotic modes: text-flow, image-flow, and page-flow, each with a different focus on layout and structure to support communicative purpose. The text-flow approach follows a traditional, linear arrangement of text, where ideas are presented in a sequence that guides the reader through logical progression. It supports fundamental text formatting to highlight or organise information. In text-flow, content unfolds step-by-step, helping readers process information as they move through the text from beginning to end.

In page-flow, the two-dimensional layout of a page is used to organise information in ways that help readers make connections between elements based on spatial relationships. This approach allows for a visually structured presentation, where layout elements like boxes, columns, or whitespace convey rhetorical relationships without requiring readers to move linearly through the text. Image-flow focuses on how images and visual elements unfold across a page or over time, adding a dimension of connected meaning to the discourse. Given the definitions of text-flow, page-flow, and image-flow (Bateman, 2009), key concepts include textual organisation, rhetorical structure, and conjunctive relations. This provides a stronger

foundation for comparing and relating to different semiotic modes. To develop a well-founded understanding of how these semiotic modes interact and how multimodal documents operate, the GeM project integrated multiple layers of analysis within a unified framework.

The multimodal conjunctive relation within the GeM framework approaches diversification of potential realisations on how meaning is crafted when we combine language with non-linguistic elements like images. Developed initially by Leeuwen (1991), this framework extends Barthes' (1977) earlier work on text-image relations, enabling a richer approach to understanding how messages are constructed across different semiotic modes. A key argument in this framework lies in its diverse classification approaches. Scholars like Martin and Rose (2008), Leeuwen (1991), and Martinec and Salway (2005) each propose varied organisational schemes based on either discourse or grammatical principles. For instance, the distinctions between two-way and three-way splits stem from these theoretical differences, highlighting the flexibility required to analyse multimodal data. However, current frameworks rely heavily on illustrative examples rather than extensive data sets, signalling the need for empirical studies to ensure reliability across analysts. This, in turn, demands more precise criteria and inter-code reliability tests to bring consistency to multimodal analysis.

Another important consideration is how classification choice reflects analytical goals. If the purpose is to interpret a text that *'explains'* an image, analysts opt for that relation even if it is not explicitly cued. More nuanced interpretations, such as 'temporal simultaneity,' face limitations because these meanings are challenging to convey through mere image-text pairing. Therefore, Leeuwen's (2005) framework takes a conservative approach, focusing on relationships that can be

directly signalled within a multimodal composition. Interestingly, he suggests that each modality might need its relational categories. His model includes tailored classifications for verbal relations, image-image interactions, and image-text combinations; each adapted to the strengths of the specific mode. For example, language offers precise terms for conjunctive ties, such as 'before' vs. 'after' or 'because' vs. therefore,' which are challenging to replicate visually. Building on this point, Liu and O'Halloran (2009) argue that multimodal conjunctive expressions are sparse, suggesting that a discourse-based analysis might be more practical. Leeuwen (1991) notes that conjunctive relation systems could evolve as user needs change, though he argues that the existing range of text-image combinations already provides an elevated level of expressive power.

Text-Flow

The first mode, text-flow, is present in page-based artefacts where verbal text is included. The visual line of the developing text serves as a basic one-dimensional organisational scheme. While this approach may consist of elements from other forms of presentation, like diagrams, tables, and accompanying texts like footnotes or side notes, the key characteristic is that the page layout does not convey substantial meaning. It is closely related to Twyman's (1979) category of *'linear interrupted'* and is the semiotic mode that underlies basic text formatting previously called *'paralinguistic'* (Crystal, 1986). Alongside page-flow, Bateman (2009) identifies two additional semiotic modes in print media: text-flow and static image-flow. Text-flow features a linear, uninterrupted sequence of text, where diagrams, images, and tables may occasionally interrupt but do not capitalise the two-dimensional space to convey further meaning. This distinction sets text-flow apart from page-flow.

In its purest form, text-flow represents a semiotic mode composed of one-dimensional, uninterrupted text (Bateman, 2011), with potential interruptions from graphic elements. Text-flow, as a semiotic mode, is very flexible and carries the whole meaning of written language. Its constraints are limited to the material it is written on and typographic conventions. The adaptability of text-flow is shown through its versatility in various applications. Text-flow and the semiotic mode exchange multiple meanings in different multimodal environments (Halliday, 1993; Hiippala, 2007, 2012; Martin & Veel, 1998). Text-flow does not employ two-dimensional space to convey additional meanings; instead, it depends on the linear progression of language as it unfolds (Bateman, 2011), which is organised rhetorically, including numbered references and navigation structures. Due to its adaptable nature, text-flow is commonly found in various data types. The GeM model accurately captures text-flow's rhetorical structure, typographic characteristics, hierarchical organisation, and layout positioning. It enables data to concentrate on three main elements: first, the use of text-flow; second, the occurrence of semiotic modes and resources within text-flow; and lastly, how text-flow functions within page-flow.

Page-Flow

The second term, page-flow, is present when a page-based artefact uses its entire two-dimensional space for communication purposes. This mode allows for integrating various elements on a page, such as text, diagrams, and graphs, which enhance individual contributions by incorporating spatially signalled rhetorical relations to support the artefact's communicative intentions. The mode of communication involving text is different from images or diagrams and is frequently overlooked. However, what needs to be understood in this context is that the visual-verbal description results from choices in both semiotic resources. According to Bateman

(2009), using the layout space to communicate additional meanings is characteristic of a particular semiotic mode, which he refers to as page-flow.

Bateman (2008) presents the semiotic mode of page-flow, which capitalises the two-dimensional space on the page for content organisation. The primary distinction between page-flow and text-flow is that page-flow leverages the complete layout space to achieve the artefact's communicative objective. Page-flow may maximise both semiotic resources and modes for this purpose. Bateman (2008) states: *page-flow can combine elements in any semiotic mode appearing on a page, including text-flow, diagrams, graphs, etc.'* An index page typically utilises text-flow for efficient navigation structures, while the cover may use page-flow with prominent images as it serves as contact text. Overall, the observations necessitate a multimodal artefact model to focus specifically on page-flow and its configuration. For this reason, it is essential to describe the three strata of page-flow: *material substrate, semiotic resources, and discourse semantics*, as Bateman (2011) suggested. Material substrate carries the notion of the medium, the semiotic resources that allow a range of choices, and the results of these choices may then be combined into multimodal artefact structures and their discourse semantics that guide the contextual interpretation of the semiotic resources.

The concept of a medium and its connection to semiotic modes is critical. As discussed previously, a fully developed semiotic mode requires a material substrate to carry its semiotic resources. This medium needs to be controllable enough to allow a community of users to utilise it for semiotic purposes. It is also essential to recognise that semiotic modes do not emerge instantly; they develop progressively when an appropriate substrate becomes available (O'Halloran, 2009). Bateman (2012) emphasises distinguishing between features intrinsic to the medium, such as

numbering, margins, and choices within semiotic modes that shape the genre structures of a multimodal artefact. It is essential to distinguish and discuss the medium in detail to outline the structure of learners-generated DMCs.

Image-Flow

Image-flow organises sequences of graphical elements instead of text organised by text-flow. This should be identified as a semiotic mode due to the sequential relationship involving a specific range of additional meanings beyond those found in the contributing images. These relations have been studied from various angles, but they are most strongly associated with conjunctive relations used in discourse semantics, such as temporal sequence and simultaneous events, as discussed by Bateman *et al*. (2007). Static image-flow, in turn, organises graphic elements into meaningful sequences.

The printed page displays images using a physical substrate and advanced production and printing technologies that we may refer to demonstrate the use of images. When working with a semiotic mode, it is essential to note that images within text-flow and page-flow differ from image-flow, which has its discourse semantics (Bateman, 2009). According to Bateman's research (2008), image-flow occurs when images are positioned closely together to create a sequential rhetorical connection between them. This indicates that the images may have multiple meanings. Fortunately, the material substrate of a page allows for the realisation of static images (Bateman, 2011).

Our limited understanding of static image-flow and its relationship to other semiotic modes presents a significant challenge, as highlighted in Hiippala's (2012) doctoral dissertation analysing blogposts. The concept of image-flow within blogposts, along with current tools for its analysis, requires careful evaluation.

Interpretation does not solely depend on the structural arrangement of images; individual interpretations vary since understanding often relies on familiarity with culturally specific connotations, such as those found in Finnish culture. Viewing data instances as image-flow should be visually supported by elements like arrows or connecting lines. Given our incomplete knowledge of image-flow and its communicative functions, it is recommended to limit interpretive scope until further empirical studies on static image-flow are conducted. All identified image-flows are annotated to clarify participating segments and their sequential relationships through layout and rhetorical layers.

Future Directions in DMC

Lim and Kessler (2021, 2024) guided on the future of DMC studies and explicitly guided on serval theoretical and pedagogical underpinnings. Multimodal composition in ESL classrooms offers opportunities for teaching and learning in this digitised era (Miller & McVee, 2013) as the new multimodality is the emerging literacy that empowers learners to read, learn, and produce complex texts (Serafini, 2014) in translingual and transcultural digital spaces. The scope for reach and pedagogy within this field has been manifold, and specific empirical and conceptual research shows that ESL writing practices are shifting in the realm of multimodal composition pedagogy and research. These studies, taken as a whole, provide factual support for the importance and advantages of digital multimodal composition in the language learning journey of ESL learners. Several themes have emerged from the existing literature that lay the foundation for future studies based on complex issues such as identity, authenticity, and rethinking of the multimodal practices in the ESL context while exploring classroom practices, translanguaging, and pedagogical practices (Canagarajah, 2023). The article, which focuses on multimodality in the

English language classroom, explores these issues and the thematic findings of previous review studies. It suggests lines of inquiry for further research (Lim & Kessler, 2021, 2024). Therefore, scholars should explore how multimodal writing can help ESL learners build their metalanguage and assess the impact on multilingual writers' communicative competence, and what assessment practices would further strengthen and expand methodological and theoretical frameworks that examine both composing processes and products and employing mixed methods to provide an all-inclusive understanding of multimodal composition in the ESL context.

Summary of the Chapter

The literature review's studies and perspectives highlight *'hidden literacies'* in teaching, learning, and daily communication (Rowsell & Kendrick, 2013). An ongoing attempt to bring literacy practices and instruction into line calls for rethinking assessment procedures (Hicks, 2015; Neal, 2011). Resources from many discourse communities are used in the iterative DMC process. Effective practice emphasises process writing or provides explicit teaching on the process. Both revision and reflection bring the composer's decisions to light. According to Yancey (2016), reflection can be a fruitful genre that benefits instructors and learners. Consciously making decisions encourages internalisation, fostering impromptu relationships and creative expression in generative and innovative communication techniques (Dewey, 1934, 1958). While Yancey (2016) emphasizes the centrality of reflection in DMC, in Pakistani ESL landscape, this practice may be constrained by limited digital literacy, uneven access to technology, and the dominance of exam-driven pedagogies, raising questions about how reflection can be realistically integrated into multimodal learning environments. The multifaceted Iterative, social, and cooperative processes are connected to the author's rhetorical goals and methods. According to Rowsell (2013),

pertinent DMC engages identities and reflects composition approaches from other

disciplines. Educators and learners must engage with challenging questions in DMC

through experimentation, play, and reflective activities. Multimodality in ESL has

gained popularity, and researchers are exploring ways to integrate and assess learners'

generated DMC tasks. As Archer and Newfield (2014) argue, if education aims to

equip them with precise tools and resources to explore this technological world, it is

essential to expose them to several resources. This research investigates the

educational affordances of various media, genres, and modes for constructing an

academic argument in an ESL context by integrating multimodality through GeM and

evaluating using textual and visual rubrics in an undergraduate class. This chapter

discusses the literature on digital multimodal composition (DMC) and the theoretical

underpinnings of the research by presenting a comprehensive analysis of the available

literature on the critical concepts of the study.

CHAPTER III. METHODOLOGY

Introduction to the Chapter

The procedures followed during the study are described in the chapter. It concentrates on the specifics of Reinking and Bradley's (2008) formative experiment methodology employed to identify, gather, and process the data. This research has been designed in a way that follows the protocols of a formative experiment, having reviewed the rationale behind selecting the formative method for this study, which includes the context, the methods employed for analysing and collecting data, the case participants, and the development and implementation of the intervention. I conclude this chapter with crucial aspects, such as trustworthiness, ethical considerations, and seeking IRB approval to conduct this study. I also delimit this study in the survey in the ESL context.

Research Design – Formative Methodology

A research methodology known as formative experimentation is primarily focused on *'applicable theory and workable instruction in the real world'* (Reinking & Bradley, 2008). Iteration and authentic context are valued and prioritised over standard controlled experiments, even though intervention is crucial. Interventions are developed in collaboration with practitioners and improved via classroom application. This method differed from experimental research and regular classroom practice in that it sought to *'develop deeper pedagogical insights'* that considered the intricacies of classrooms instead of merely determining if an intervention is effective (Colwell & Reinking, 2016). Formative experiments aim to identify the instructional design that hits specific learning targets; that is, what this research attempts to ascertain is how those interventions might be used to accomplish a desired pedagogical aim and, in the

process, build, evaluate, and improve pedagogical and educational theories that are specifically beneficial to practitioners (Reigeluth & Frick, 2003).

Given that this methodological approach was fundamentally iterative and enabled the observation and adaptation of numerous complexes, interacting variables that frequently complement integrating technology in the classroom, it was exceedingly efficient and ideal for investigating digital interventions, such as the ones employed in this investigation (Reinking & Watkins, 2000). This study used a framework uniquely for planning and carrying out data collection and analysis that involves identifying a researchable pedagogical objective, designing an intervention, identifying helping or hampering factors of the intervention, implementing those alterations to the intervention, and documenting the unexpected results of the intervention (Bradley & Reinking, 2011; Reinking & Bradley, 2008). Learners worked toward developing multimodal projects on the selected topics during the semester, as aligned with SDG-4 emphasis on inclusive, quality education, the research design aims to empower diverse learners to construct knowledge using multimodal texts, tools, and resources that extend beyond linguistic proficiency. The topics of the DMC were to be of interest to the academic community, of an argumentative essay on any current controversy in Pakistan or beyond, and to have a clear purpose. The intervention spanned 15 weeks, with 3 contact hours per week, totalling 45 instructional hours. They received the instructor's feedback throughout the course and evaluation at the end of the semester.

Research Context

This research took place in a private higher education institution centrally located in an urban setting that disseminates education based on a liberal arts framework to prepare graduates for professional careers by offering diverse learning opportunities,

including innovative approaches to English teaching and multimodality. These approaches emphasize the integration of digital and multimodal composition practices, equipping students with the skills needed to navigate complex communicative demands in academic and professional contexts, auxiliary SDG-4. This university offers state-of-the-art, technologically equipped classrooms with multimedia support and digital resources, therefore suitable for multimodal intervention using online applications, i.e., Google Sites. The participants were drawn from a single private, urban, English-medium university in Pakistan. As an English-medium institution, learners are required to use English in academic settings, which likely influenced their familiarity with digital literacies and English academic discourse. This specific institutional and sociolinguistic context is important to consider when interpreting the findings.

Researcher's Reflexivity

The research was conducted primarily by the researcher, an academic instructor. The approach to research of necessity required reflexivity because I wore both hats: researcher and active participant in this formative process and, at one point, an object of research myself. Reflexivity is a research approach commonly associated with qualitative research to mitigate bias and foster trustworthiness. It is characterised by the researcher's explicit acknowledgement of their subjectivity in selecting study aims, techniques, and interpretation of outcomes. It has gained universal acceptance in all research, even in the laboratory (Latour & Woolgar, 1979). I maintained objectivity in reporting results by triangulating data from different sources and identifying inconsistencies within a single perspective (Flick, 2019).

One could argue that a reflexive approach enables a more complete and accurate description and interpretation of the study procedure and outcomes, which

are influenced by the social and personal (Walford, 2002). Reflexivity was seen as an ongoing, interdependent process between the researcher and the subject of the inquiry as the investigation progresses, and one impacts and is influenced by the other. Reflexive interpretation, as defined by Alvesson and Skoldberg (2000), is a reflective technique of interpretation that places *'less emphasis on the collection and processing of data and more on interpretation and reflection.'* This contention highlights the importance of reflexivity. This method necessitates that the researcher reflect on their ways, as this research was ingrained in a research group's intellectual and sociocultural traditions, and be conscious of and sceptical of their theoretical and philosophical stances and presumptions when interpreting findings.

The research is reflexive because reflection becomes a form of interpretation of the interpretation (Haynes, 2012). This research aimed to provide a practical solution to how learners become better writers by creating, developing, implementing, and assessing subject-specific online learning resources. From a philosophical standpoint, this is consistent with the pragmatist paradigm or worldview since the research was conducted to solve a real-world problem (Teddlie & Tashakkori, 2009). Contrarily, this research has been based on a multiliteracy framework that aims to develop multimodal writing tasks. The researcher was required to reflect on himself as an investigator enmeshed in the intellectual and sociocultural traditions of a research community while also being conscious of and challenging assumptions in the interpretation of data, together with their philosophical and theoretical orientations (Glesne, 2016). However, I also consider the contributions of additional theoretical perspectives on online learning and alternative data analysis and interpretation methods. Gathering, analysing, and interpreting data on myself and other case participants involved in the design process has proven to be the most challenging part

of using reflexivity in this research. The study's emphasis on situated practice exemplifies my conviction that practice and theory should be mutually inclusive and have an iterative relationship. Practice informs theory, but theory also informs practice. Through this study, I hope to contribute a small amount to the multiliteracies debate and advance best practices for morally integrating multiliteracies education in writing programs, which must necessarily include multimodal writing practices and Evaluation. The fact that the researcher was a course instructor may have presented a risk of bias and power dynamics. Although anonymization, voluntary participation, and creating a structural framework of analysis (e.g., visual rubric, Toulmin model, Genre and Multimodality approach) served as efforts to reduce such risks, not all such risks can be completely abolished by the impact of this positionality. It is thus the hope of the authors that the readers make interpretations of the findings with the above backgrounds in mind.

Study Participants and Sampling Criteria

Sampling Criteria for Learners

All advanced-level writing students at a large private institution in Pakistan formed the population, whilst one undergraduate class drawn from that population is the sample for this study, following a convenient sampling technique for easy approachability (Cresswell, 2015). The convenience sampling technique was predetermined by the institutional and pedagogical context point of view, as the study took place in an ESL undergraduate classroom in which the researcher also served as an instructor, and participant access was both feasible and ethically appropriate. Besides, the formative experimental design needed the baseline digital literacy proficiency of the study participants to ensure that they could participate meaningfully in the multimodal tasks. The aim was to generate in-depth insights into a bounded

case rather than to generalize findings across populations. To minimize potential

biases due to convenience sampling, several steps were undertaken: triangulation of

the data, such as the use of learners' artefacts, reflective accounts, pre- and post-test

results, and thick description to promote transferability. This practice aligns with the

established methodological recommendations in classroom-based research in applied

linguistics (Dörnyei, 2007; Creswell, 2012; Reinking & Bradley, 2008). Participants

were of intermediate-level English usage as determined by the Accuplacer Placement

Test, assessed by the undergraduate courses' placement test. The intervention lasted

12 weeks during the semester. The following selection criteria as followed for the

learners in an ESL context:

- Enrolled in the undergraduate program in a university setting in an ESL

    context – research site.

- Have cleared the Accuplacer test (English Proficiency Entry Test) with a score

    of 85 or above (out of 120) as the cut-off point for inclusion in the study.

    According to institutional placement guidelines, this range indicates an

    intermediate level of English proficiency, which made these learners suitable

    for the advanced academic writing and Digital Multimodal Composition tasks

    required in this study.

- Enrolled in a BS academic writing course in a multidisciplinary class in a

    university setting in an ESL context.

- Enrolled in single or mixed discipline classes in an undergraduate class in a

    university setting in an ESL context.

Sampling Criteria for Writing Instructors

The interviews with the writing instructors in a private institution were conducted

using semi-structured interviews based on their beliefs and perspectives on using

technology in their writing and communication courses. The writing coordinator of the Writing and Communication Program at a private institute was interviewed before the intervention to ascertain its context and as required during the investigation. Contrariwise, ten instructors were interviewed about their beliefs and practices in deploying digital modes and multimodal approaches in their writing classes. A purposive sampling technique was used to conduct instructors' interviews because of their willingness to add multimodal components and integrate technology in their writing classes. Sampling criteria were used to follow as appended below:

-   The instructor has experience using technology (at least) in their ESL academic writing classes in Pakistani ESL context and is familiar with using multimodality.

-   Instructors currently teaching academic writing courses in the ESL multidisciplinary classes.

-   Instructors are currently teaching compulsory English BS in single- or mixed-discipline classes.

-   Instructors have full-time faculty positions at an undergraduate institution.

-   Instructors willing to participate in research and be accessible for data collection.

Procedure for Intervention

The essential elements of this intervention of writing stages were informed by Hyland's (2007) genre pedagogy, which includes preparation, setting, context, modelling, planning, joint construction, independent construction, and comparing peer-reviewing following the GeM framework during an academic writing course in an ESL context. The researcher allowed learners to compose and write an argumentative essay as their DMC task following the Toulmin method of

argumentation (1958), which divided arguments into six components: claim, grounds, warrant, qualifier, rebuttal, and backing. This intervention followed a sequence of activities based on three consecutive steps: first, the development of arguments that included claims, evidence, and elaboration of that evidence; second, the use of digital technologies appropriated for creating digital, multimodal arguments; and third, a genre-based approach to writing (Reinking & Watkins, 2000). In the ESL context, it is easier for learners to understand small fragments instead of more extensive stretches of language. A novel aspect of this intervention is allowing learners to assemble smaller pieces while the instructor completes the picture of how these fragments are incorporated into a whole text in the context of its use through genre pedagogy. This learning cycle of teaching and learning unfolds, and instructors and learners adopt various strategies and roles.

Stage I

At this stage, the instructor and learners collaborated to reveal the context for which digital multimodal composition is to be composed and the academic settings in which it is used, as Hyland (2003) suggested. At this stage, the learners searched the base units following the GeM framework by exploring the context built upon shared experiences of the context of the DMC text that the learners were learning to construct. The objective was to familiarise learners with genre conventions, multimodal cohesion, and coherence concepts while understanding the influence of cultural and situational contexts. They explored GeM layers: base, navigation, layout, and rhetorical layers, emphasising their role in structure and meaning and the semiotic modes such as text-flow that explain its linear logic using Toulmin's model. Image-flow introduced sequential rhetorical relations between images and page-flow that exploits the use of the layout of digital multimodal artefacts for communicative goals.

The class activities were focused on the knowledge about the context of language use that was relevant to the cultural knowledge, such as the DMC purpose, the argumentative writing as a social activity, and exploring the field of argumentative as a subject (field), gained knowledge about the roles and relationships of those communicating (tenor) and knowledge about the means of communication of DMC through Google Sites (mode). The class-based activities include discussions, demonstrations of Google Sites as an interactive digital platform, note-taking on argumentative writing as a genre, brainstorming, and opportunities to reveal relevant perspectives on digital platforms and appropriate vocabulary for argumentative writing (*Weekly Distribution of Tasks Based on Instructional Stages of Hyland's Genre Pedagogy is presented in Appendix D*). The learners extrapolate cohesion and coherence in a digital text, cohesion representing how meaning is consolidated across modes, and coherence aligning with audience expectations and logical flow.

The instructor guided learners to analyse their personally compiled articles using a framework for argumentative writing as a genre knowledge, and they posed queries, planned group and pair discussions in an ESL classroom, and created charts that serve as guidelines for learners to follow. These two rhetorical and base layers helped learners understand argumentative writing features, develop genre knowledge, identify key components, develop critical thinking, and help them improve their argumentative writing skills. Activities have been designed around genre and context while analysing multimodal artefacts, such as advertisements, for GeM layers and semiotic mode use, and identifying how situational and cultural contexts influence their design. The intersemiotic relations use Royce's framework to identify verbal-visual complementarity in texts (e.g., textbook diagrams or infographics) and

mapping cohesion to show connections between semiotic elements in a digital

multimodal artefact.

Stage II

At this stage of modelling the text, the objective was to demonstrate how multimodal

cohesion and coherence can be achieved through intentional design in a digital

multimodal artefact by focusing on the GeM framework. At the base layer, it models

the content elements and their relationships; at the navigation layer, it links and paths

supporting the usability of a multimodal artefact in an academic context, whereas

layout helps in spatial organisation for clarity and rhetorical layer that establishes the

argumentative progression using Toulmin's model by employing semiotic modes to

model complementary text-flow, image-flow, and page-flow and intersemiotic

complementarity through highlighting the synergy between text and visuals for

cohesive meaning.

The supporting activities include mode integration practice that models how to

align text and visuals (e.g., creating a news article with embedded images), layered

design analysis by breaking down a multimodal artefact into its GeM layers, and

analysing coherence and interactive demonstration, concluded by creating a

multimodal text, demonstrating how each element contributes to cohesion and

coherence in a digital multimodal artefact. The instructor used explicit instructions

through modelling while analysing representative available samples, digital

affordances used in the digital texts, the ways Toulmin's model of argumentation

guides structuring an argument, and how argumentative writing can be planned and

drafted using critical features from the rubric developed for this study. The rubric

allowed the learners to view samples of what to follow in a visual rubric *(see*

Appendix A) and how a digital affordance would allow for the construction of digital arguments using textual and visual modes.

The learners understood the features of argumentative writing following Toulmin's Model of Argument, such as logical flow of information, having credible claims, supporting evidence, and elaboration of that evidence would significantly contribute to the coherence in their writing. While working on the model argumentative blogs, such as digital blogs, they established how functional metalanguage works, in which way visuals could contribute to the overall meaning of a digital text, and how important it is for them to learn to communicate effectively using digital platforms, while employing digital affordances in an academic context. Overall, at this stage, the learners strategically drew their attention to textual and visual modes that could be used for academic ESL contexts while learning about critical features of argumentation using Toulmin's Model and visual components informed by Kress and Leeuwen (2006) and they were exposed to the argumentative structure, lexicogrammatical features, visual affordances such presentation, layout, font and multimodal orchestration. The digital graphic organiser and practising handwriting and digital writing have been practical strategies to model the structure and sequence of argumentative writing tasks. They understood how they could make textual and visual choices for this meaning-making process and compared how each option would help to communicate and determine the effect of their digital multimodal text for the online academic audience, and how reading a text is different than viewing a text on digital platforms using the exact text.

Stage III

At the guided practice stage, the objective was to collaboratively design a multimodal text that is cohesive, coherent, and contextually appropriate while focusing on the

critical features in a holistic way, such as combining GeM layers, semiotic modes, and Royce's intersemiotic complementarity to design a multimodal artefact and prioritise cultural and situational alignment to meet audience expectations. The instructor supported practice in the digital multimodal argumentative composition that focused on the stages of constructing the text. They selected a topic, researched, and established knowledge of the text context they planned to write. While working on the text, the instructor guided them to jointly construct the text based on the shared experience of the context of culture and structure. They discussed in class what choices would need to be made for the textual and visual modes, how each mode would contribute to the meaning-making process, and how digital platforms such as Google Sites conform to patterns of an argumentative multimodal composition. They negotiated and decided on the structure of the argumentative multimodal blogposts and how it could help achieve academic purposes and customise the subsequent digital text to its immediate digital content and context. At the same time, the instructor gradually delegated the responsibility to the learners, allowing them to take the digital phase and lead from here onwards. They were conferencing activities to construct a coherent draft that qualified both the textual and visual standards for this task. They developed a checklist following the rubric set for the task and reviewed it together as a class to cross-check what they had incorporated, what choices they had made, and why. The learners created a context sheet defining situational (field, tenor, mode) and cultural parameters. They collaboratively drafted a multimodal text with an academic argument using Toulmin's model, ensuring that it qualifies for verbal and visual elements that complement each other cohesively. For coherence, they did a peer-review activity and evaluated coherence based on audience alignment and logical structure.

Stage IV

The objective was to independently draft a multimodal artefact demonstrating mastery of cohesion, coherence, and contextual awareness in previously practised areas, such as applying GeM layers and semiotic modes independently and creating intersemiotic relationships that enhance overall meaning that addresses both situational and cultural contexts in the design of an artefact. The learners composed their digital multimodal composition texts, independently monitored by the instructor. In this activity, all learners actively composed their digital multimodal compositions. They researched their topics and consulted the instructor if they needed help. Learners independently produced digital multimodal compositions on Google Sites and successfully managed to publish their web pages. The instructor restrained himself from interrupting the process of creating and publishing their digital multimodal compositions unless some learners approached him. They were mentored, monitored, and put into peer support by subtly replacing the teacher's support. They were asked to review the checklist before publishing their final drafts.

Stage V

Once the learners had completed their DMC projects using Google Sites, they were asked to review each other's work, compare it, and give and receive feedback from their peers. They were also invited to be part of focused group discussions on their choices, resources, and processes that they went through to get a clear understanding of this intervention and how effective this process has been from their point of view. They were asked to discuss challenges they faced and any concerns they might have about digital multimodal composition through a focus group discussion. Contrariwise, it was essential to mention that 32 out of 40 learners agreed to be part of these focus group interviews, and eight did not show up due to their reservations or personal

reasons. All these conversations were videotaped using mobile applications and later transcribed by the researcher.

Data Collection Instruments

Quantitative Tools – VG-Informed Visual Rubric

Learners' pre- and post-argumentative performance on their DMC tasks and outcomes were evaluated, and quantitative data were collected using an instrument. Each section had a scoring range from one to four, with a total maximum score of twelve for the pre-test and post-test. To compare the quality of the tasks effectively, it was necessary to use a consistent rubric with identical categories. Each category was assessed using semiotic tools and their integration into the job outcome, as the coordination of several modes is a crucial component of DMC. The visual rubric *(see Appendix A)* has been developed, considering the use of semiotic resources in visual grammar to construct a digital multimodal argument (Kress, 2011). It provides a format for learners to reflect on their choices and align evaluation practices with an argument's social and semiotic aspects. Indicators for multimodal criteria were carefully selected, including colour, images and graphics, font and text, design and layout, and multimodal orchestration. This rubric was developed and validated by the experts in the field of multimodality before it was applied for evaluation.

Qualitative Tools

Interviews with the Writing Program Coordinator. To build this study at the baseline, semi-structured interviews are grave for the writing coordinator as they allow for gathering essential information from the participants to help develop and design this study (Horton *et al.,* 2004). This semi-structured interview format allowed the researcher flexibility, as the coordinator could have inquisitive responses to elicit a broader range of information about the institution, the writing program, technology

inclusion in writing instructions, and assessment practices. The written notes taken during the interview are minimal, capturing only the necessary information, which helps maintain focus and efficiency.

Focus Group Interviews with Learners. Learners were invited to take part in focus group interviews afterwards, and they completed their DMC tasks. These interviews aimed to probe deep into their argumentative digital tasks' resources, selection, and writing processes. With the participants' explicit consent and permission, all interviews were transcribed after being recorded by the researcher.

Interviews with Writing Instructors. Purposive sampling would have been adequate, where writing instructors are selected based on their expertise and having at least two years of experience in teaching academic writing using technology, and their willingness to incorporate multimodal aspects in their writing classes. The instructors were invited to have interviews where they have the expertise to incorporate technology in their writing lessons frequently and may offer insightful perspectives on this academic research.

Evaluation Procedures and Data Analysis

To gather baseline data from the case participants at the beginning of this formative experiment, they were asked to select a topic of their choice from the given topics on argumentative writing and to compose their argumentative compositions on Google Sites before and after the 12-week-long intervention. The researcher ensured that the learners got the same writing tasks before and after the writing course to ensure the comparability of the two tests. The TOEFL is one of the most popular and dependable high-stakes English proficiency examinations in the world, and as such, the writing subjects for the pre-and post-test were taken from its independent writing tasks. Two experienced English instructors and a writing coordinator with expertise in teaching

learners from the same demographic as the participants were consulted to ensure the comparability and validity of the study.

Quantitative Analysis

Before and after the intervention, the learner's ability to compose an argument was assessed with pre- and post-tests. For this assessment, they were asked to write a debate in reply to the use of words only. The writing prompts were selected considering the argumentative genre practised by the learners, managing the impact of the written subject, and the familiarity with the topic on writing ability (Yoon, 2017). To examine the effect of the intervention on learners' writing abilities, their responses to a writing task administered both pre- and post-intervention were initially scored and subsequently analysed using Statistical Package for Social Sciences (SPSS) software. A paired t-test was employed to quantitatively compare learners' scores on argumentative writing before and after the intervention (Stephen *et al*., 1979). For the present study, the researcher used this visual rubric to assess the prompt, as it was advised when applying criteria-based assessment (Thorndike & Thorndike-Christ, 2010).

The relationship between the scores of their writing and visuals was analysed using t-tests to examine the relationship between the scores. Learners' compositions were assessed using this visual rubric (MV) developed for the study. The visual rubric has colour, font, design/layout, images/graphics, and multimodal orchestration as essential components. On this rubric, there were four; the maximum score and the minimum score were one. The maximum score for both the rubrics was 20 for both the pre- and post-tests. The usage of various semiotic tools and their integration into the job outcome were assessed alongside each category since the orchestration of several modes was a crucial component of DMC.

Scoring. An impartial evaluation technique was employed to ensure that no identifiable information was disclosed. Learner names, learner ID numbers, and the creation time were removed from the essays to avoid bias against different tests and learners. Preferably, the essays were consistently renumbered and rearranged in a way only known to the researchers. Two qualified and experienced English language instructors evaluated each essay using the ESL Composition Profile (Jacobs *et al.,*1981). The grading system was selected because it offered a comprehensive, final assessment score and enabled an analytical examination of the local and global writing components. A training session ensured inter-raters' dependability and the marking standards' consistency. Five sample essays were provided to the two raters to decide on a final grade in agreement. If the component ratings of the two raters differ in bands, they have to discuss the criteria and rationalise their choices until they reach a consensus (component scores are in the same band). The final score was derived from the sum of the evaluations given by the two raters. The two raters were allowed to analyse the remaining essays independently after they had evaluated thirty pieces and had a firm grasp of the grading criteria. Cohen's Kappa was calculated for each rubric component to assess inter-rater reliability, which indicated substantial to strong agreement across all rubric components, as shown in Table 3.1.

Table 3.1. *Cohen's Kappa (K) Interpretation*

Rubric Component	Cohen's Kappa (κ)	Interpretation[1]
Colour	0.84	Strong
Images/Graphics	0.79	Substantial
Font/Text	0.81	Strong
Design/Layout	0.76	Substantial
Multimodal Orchestration	0.82	Strong

The framework analyses arguments by examining three key elements: the role of content as it explores how the information presented builds the argument, and

social connections, because they identify the relationships implied between participants in the argument. Lastly, structure for clarity while analysing how the argument is organised to ensure a clear and cohesive message. It explains the nature of the rubric developed and used for the present study to evaluate learners' blogposts, and it has the following components: visuals having colour, images/graphics, font/text, and multimodal orchestration.

Qualitative Analysis of Digital Composition through GeM, Learners, and Participants' Interviews

Qualitative data collected from the learners and instructors during focus group interviews were to be collected and analysed using thematic analysis. The researcher invited the learners for focus group interviews from the learners and provided them with the opportunity to reflect on their experiences in composing their multimodal texts. The interview selection criterion was having a mixed group of learners with high, average, and low scores. The multimodal Google Sites artefacts were to be evaluated using the visual rubric *(see Appendix A)* for quantitative analysis. They were also coded, employing a priori coding in the retrospective analysis that examines for any changes in the learner's ability to communicate aspects of the formative experiment's objective and intervention, mainly how they employed digital multimodal tools and their capacity to convey the case, including claims, evidence, and explanation of that evidence, following Toulmin's Model. The learners' and instructors' interviews were analysed through thematic analysis (TA) using NVivo software for qualitative analysis proposed by Braun and Clarke (2006 & 2019), mainly because of the practicality of this framework (Maguire & Delahunt, 2017). This framework informs thematic analysis to look for common threads and extends across six phases: familiarising with the data, generating codes, theme searching and

identifying, reviewing themes, defining themes, and reporting (DeSantis & Ugarriza, 2000; Majid & Islam, 2021). Data from Google Sites and learner reflections through focus group interviews, including lesson plans, assessment practices, and pedagogical practicum, were used to support the description of the learners' DMC artefacts. A stratified sampling criterion has been used for selecting the learners' generated DMC artefacts to ensure each modality data type and relevant subcategory is represented proportionally in the sample size to do a fine-grained analysis and pick up specific nuances for multimodal granularities. Interpreting the *'complex social happenings'* (Dyson & Genishi, 2005) in the digital multimodal composition was enabled using several data sources. Formative experiments prioritise fundamental classroom interactions above well-thought-out experiments (Reinking & Bradley, 2008). The recommendation for the educational setting by Reinking and Bradley (2008) was to design research in the spirit of continuing discourse, negotiation, and decision-making by all involved stakeholders. Learners' interview data and their DMC artefacts on Google Sites were coded employing a priori coding in the retrospective analysis that examines for any changes in the learner's ability to communicate elements of the goal and intervention of the formative experiment, specifically how they use digital multimodal tools and their ability to convey the argument, including claims, evidence, and explanation of that evidence.

The GeM Layered Structure

Base Structure

A straightforward method for understanding the document's content is to list the elements in the textual or graphical medium informally. However, this approach implies a logical order or hierarchy within the content. A hierarchical representation elucidates the relationships among various parts of the content without distinguishing

between linguistic and graphical presentations. This representation captures how the content is discussed and depicted on the page. However, this content representation does not explain why certain content appears on the page or its role in the overall argumentation.

Rhetorical Structure

Part of the Toulmin Model from *'The Uses of Argument (1958)'* for the textual part of the argument, claim as a part of the assertion one hopes to prove, grounds as a rationale to the claim, warrant serves as a connection between claim and grounds, backing as a support for the warrant, rebuttal as a potential objection to the claim and lastly the qualifier that limits put on claim.
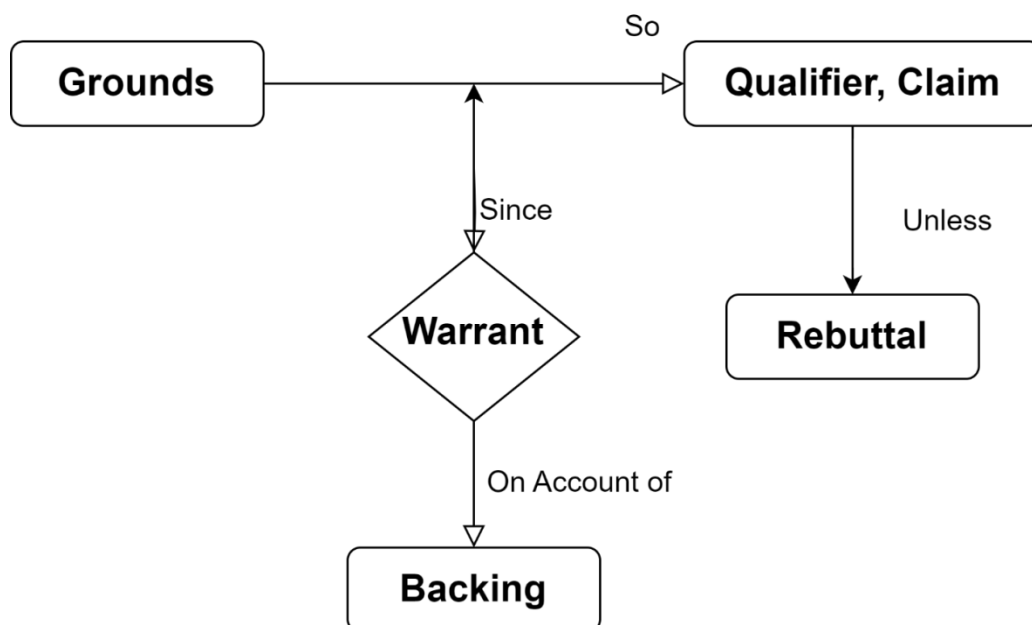
Figure 3.1: *Analytical framework for Toulmin's Model*

Layout Structure

The subsequent analysis stage thoroughly characterises the specific layout decisions made in each document. The layout is outlined as a hierarchically organised collection of layout elements, along with those elements' properties (graphical and typographical). Various rhetorical organisations convey a specific content structure,

and multiple layout structures can be chosen for any given rhetorical organisation. By breaking down the layout structure into distinct elements and sub-elements, we can conduct a precise hierarchical analysis of the page and link it to the typographical features of each component.
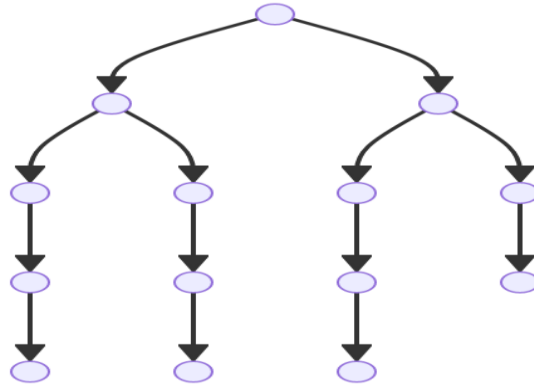
Figure 3.2: *Hierarchical Structure in the GeM Framework*

Navigation Structure

The navigation structure comprises the *'signposts'* that help make the rhetorical organisation on the page comprehensible. It infers potential pointers and entries based on common navigation structures: these pointers can be in the form of headings, subheadings, or paragraph breaks, whereas these entries can be in sections, subsections, and paragraphs, creating a clear visual hierarchy, guiding the reader through the different sections of the content.
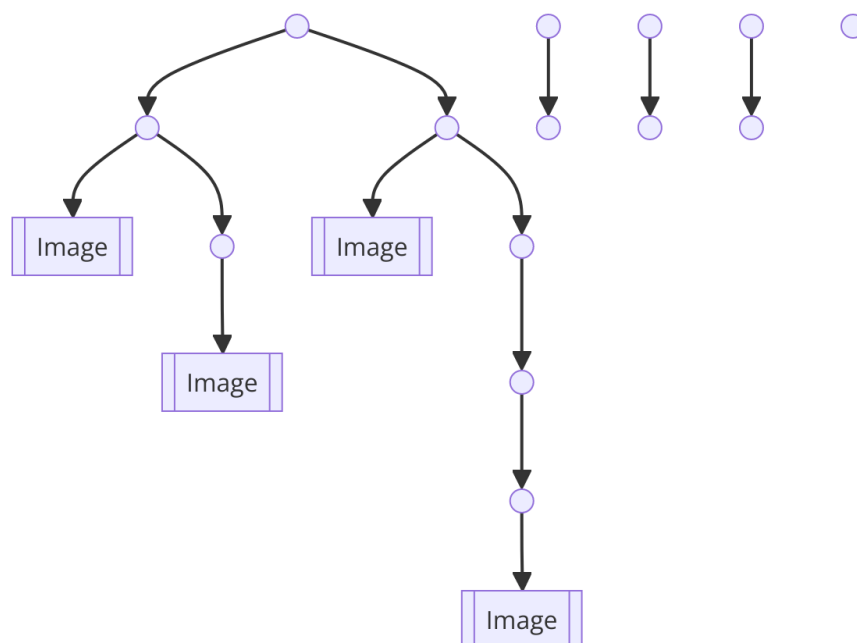
Figure 3.3: *Navigational Structure in the GeM Framework*

The GeM framework provides tools and a methodological approach for analysing learners' digital multimodal compositions in the ESL context. It focuses on identifying recurring patterns using images, colours, language, and layout combinations. The framework is designed for an annotated dataset driven by a corpus, making up four main layers of analysis: the base layer, rhetorical layer, navigation layer, and layout layer. The model asserts that these layers are the minimum needed for effectively standing for page-based documents. While there may be added layers, omitting these would exclude essential components from any multimodal document. The GeM model's formal specification defines layers for constructing multimodal document corpora in line with current guidelines and best practices for designing linguistic corpora. For the research, GeM as a framework helps draw extensively on learners-generated digital multimodal compositions in an ESL context, accessing experiences investigating rich, meaningful artefacts with a critical evaluation of linguistic theories on the functioning of multimodal artefacts.

Several inimitable communities are examining multimodal artefacts from diverse perspectives. The analysis focuses on applying the functional linguistic concept of *'genre'* to learners' generated multimodal artefacts to model digital multimodal composition as a genre in an ESL academic context. Hiippala (2017) modelled the structure of a multimodal artefact by analysing the blogposts and identified several functional characteristics, such as communicative goals, the context of use, medium, affordances, content, and discourse semantics. In outlining these, he encompassed the artefact's production, consumption, and distribution as decisive factors. The overall meaning of these artefacts is created through a combination of text, layout, graphics, and images. For this purpose, GeM provides a strong rationale for using this as a framework for mapping and outlining structure in the learners' generated multimodal artefacts.

The goal of this analysis is to genre map in learners-generated multimodal compositions using the Genre and Multimodality (GeM) framework by Bateman (2008); such an analysis would initiate defining multimodal genres in enough detail to identify their common characteristics and then use empirical evidence to support these definitions to model and define the structure of Multimodal genres in an ESL academic context.
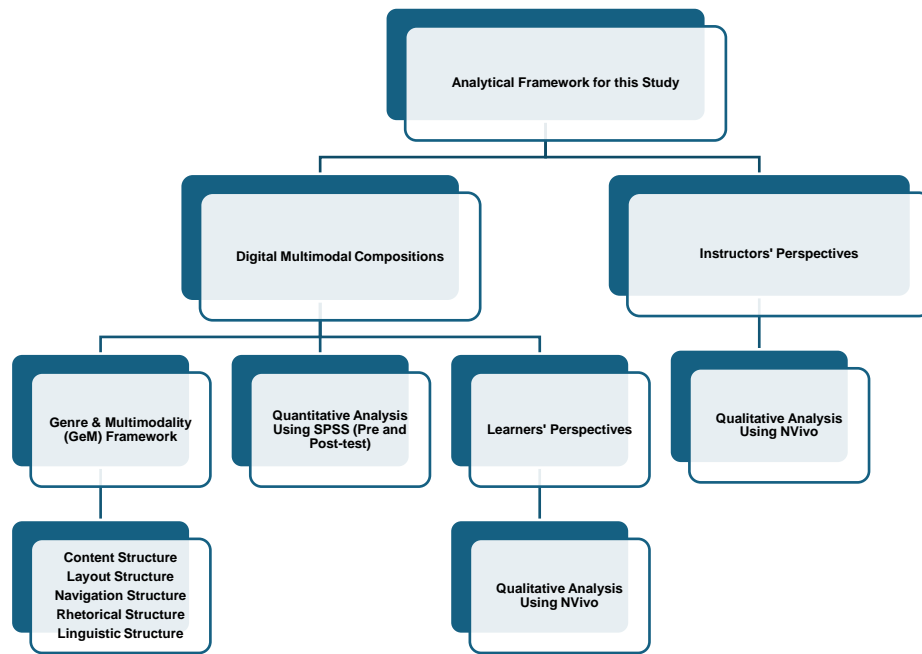
Figure 3.4: *Graphical Representation of Analytical Framework of the Study*

Table 3.2. *Timeline of Formative Experiment*

Phase	Timeline	Stage	Steps	Data
Phase I:	Spring 2023	Recruitment and Planning Understanding the context	• Initial Planning and field research • Pilot Study • IRB Submit • Interview and intervention iteration planning	• Interview (Instructor) • Learner artefacts • Instructor planning and intervention artefacts • Memos/field notes • Correspondence • Meeting with Writing Instructors, Coordinators, and the Head of the Writing Centre • Conducting their interviews for planning the lessons and the need for such an experiment. • Researcher's Observations
Phase II	Summer/Fall 2023	Gather Baseline Data Implementation and adaptations	• Approval of Proposal • Approval of IRB	• Interview (Instructor) • Learner artefacts • Instructor planning artefacts • Memos/field notes • Correspondence - Interviewed Instructors - Administered Pre-Intervention Writing Prompt - Administered Pre-Intervention Multimodal Reflection *During Intervention* - Observed and recorded steps needed to proceed toward the goal. - Retained regular probing with instructors. - Reviewed initial coding. - Interviews with instructors, learners, and faculty
Phase III	Fall 2023	Gather Post-Intervention Data	• Data Collection • Interview and intervention iteration planning. • Implement Intervention	• Interview (Instructor) • Learner artefacts • Instructor planning artefacts • Correspondence - Post-intervention writing prompt. - Interviewed learners and instructors
Phase IV	Spring 2024	Analysis Writing and Reporting Stage	• Data Analysis	• Quantitative analysis • Qualitative – Thematic Analysis - Trained scorers for scoring writing prompts - SPSS testing - Qualitative Analysis following the GeM framework

Trustworthiness

The study's concept, implementation, and reporting all focus on fostering trust (Schwandt *et al*., 2007). Formative experiments, as this one does, may use quantitative and qualitative data; nonetheless, inferences made from the quantitative data are independent (Bradley & Reinking, 2011; Reinking & Bradley, 2008; Reinking & Watkins, 2000). Credibility increases through thorough notes, procedures, and careful data reporting. Geertz (2003) asserts that thick description lets the facts speak for themselves, while the multiliteracy framework offers a framework for analysing learners' DMC using text and visuals. Triangulation while using other data sources improved dependability and provided more data and time for saturation (Creswell, 2012, 2014; Creswell & Tashakkori, 2007). Rigorous coding occurred when outside stakeholders were involved (Miles & Huberman, 1994). Planning, understanding the setting, conducting a pilot study for a semester, and conducting the main study with the intervention and post-intervention took longer than a year to complete. The researcher's role can describe this positionality. The research process's narrative account paints a complete picture and highlights the subtleties and difficulties of conducting a formative experiment (Reigeluth & Frick, 1999, 2003).

Quality of Learners' Traditional & DMC Arguments
- Pre and Post test
- Instructors and learners' interviews
- Learners' questionnaire (pre and post)

Aspects of Formative Framework
- Field notes
- Learners' artefacts
- Instructor and learners' Interviews

Context
- Interviews with writing coordinator
- Feild notes, class oberservation,
- Documentation such as course outline and institutional planning

Figure 3.5: *Sources of Data Triangulation*

Ethical Considerations

The data I need to collect for this dissertation requires me to understand how well-versed they are in playing with different digital tools to compose their multimodal project. The research design demands that I interview them and observe what they choose to write and which digital site/software they use. Informed consent was obtained from all research participants beforehand, and the researcher approached the research participants after following protocols. Institutional SOPs (Standard Operating Procedures) were observed. The names and identities of all the research participants and sites were kept confidential. The research participants were also informed about their voluntary consent and freedom to stop participating in the study if they wished to drop this endeavour. Each participant was requested to complete an online consent form for the study. The data was kept secret, pseudonyms had been used to hide the identity of the research participants, and the project maintained the confidentiality of the study participants and their data. The findings of the study are to be used for academic and research purposes.

As a part of the research, it was grave to note that I was also the instructor, and such a situation might cause a conflict of interest between my role as an instructor and a researcher (Hammack, 1997; Wong, 1995). An instructor aims to assist learners in learning by bringing about change, whereas a researcher attempts to comprehend a phenomenon via methodical observation (Wong, 1995). The instructor's role demands immediate action, whereas the researcher's role demands observations. The decision was made while developing the study to mitigate such a situation, prioritised by the educational aims of the previous studies (Hammack, 1997; Huang, 2015; Nolen & Putten, 2007).

Delimitation

The study has been delimited to one institution and the undergraduate level of

learners. The study has been delimited to argumentative writing using a digital site,

which was Google Sites, and involved learners in learning to play with different web-

based tools, such as images, web features, and graphics that can give specific learners

an edge over those learners who are not tech-savvy. The second delimitation of the

study was to include learners who were taking a course with the researcher in a

writing class. The delimitation may affect the sample size's representativeness. The

study presents promising findings that warrant further investigation for learners at

large, private-sector universities. There would not be substantive data to suggest

whether these findings would also apply to learners enrolled in backward areas or

state-owned institutions. Contrarily, there was no evidence to support or indicate that

these data would not be appropriate for those groups; additional data may confirm or

refute the conclusions for learners at these institutions. Despite delimitation, the study

contributed to the existing body of literature and offered exciting insights into

multimodality vis-à-vis traditional writing instructions.

Summary of the Chapter

The chapter discussed the overall study plan and the formative research methodology

required to conduct and complete the pedagogical intervention and investigation. The

practical rationale for the mixed methods design was first provided to achieve the

objectives of the study. The methodological components were then outlined, including

data sources, sampling strategies, data collection techniques, and protocols for the

data collection instruments for the study. The processes of gathering, organising, and

analysing multimodal data from various perspectives were then covered. For instance,

the chapter illustrated what a formative experiment looked like by displaying the

alignment of what was investigated, how the intervention was designed, how it was conducted, and what results it yielded. Also, consequential aspects such as trustworthiness and ethical considerations were discussed while conducting the formative experiment.

CHAPTER IV. DATA ANALYSIS

Introduction to the Chapter

The chapter reports the empirical findings of data collected and analysed retrospectively with the methodological framework of a formative experiment that will contribute to the progress of the experiment. The question is how to teach learners to design multimodal texts using available semiotic resources and the criteria to assess multimodal competence of ESL academic writing. The study developed a multimodal intervention in the academic writing course and implemented it employing genre pedagogy as an approach in the ESL context. For this purpose, two study objectives were addressed: to investigate how an intervention impacts learner academics, the implementation of such an intervention to enhance learner arguments in writing, and the causal relationship between genre pedagogy and DMC development in ESL writing performance. The first study objective was to design genre-based instructional practices and develop multimodal interventions in an English-language Pakistani context that influence learners' academic writing. Secondly, the study evaluated the effectiveness of visual rubrics in assessing learners' digital multimodal tasks through genre pedagogy. Hence, the overarching hypotheses were to inquire about and streamline the data collection process. The methodological framework has informed these questions of the formative experiment (Colwell & Reinking, 2016) that guides separate phases of the experiment, such as adjustments made to the intervention in response to circumstances that inhibited it during the intervention. These elements either support or impede the intervention's ability to meet its educational objectives, provide the desired results, and change the teaching and learning environment to the desired degree. Along with reporting progress toward the purpose, the research considered qualitative and quantitative data. These findings

emerge from data analysis from various sources and mixed methods during the formative experiment (Gravemeijer & Cobb, 2006).

The quantitative data were primarily collected through the pre- and post-intervention test results. The comparison of pre-and post-intervention tests through paired samples t-tests was summarised to relate the findings of the first primary research question and its two sub-questions. It is followed by the results of the second research question about the improvement in the writing skills of the learners, which is analysed through descriptive statistics. The chapter discusses the findings of the qualitative data collected during the formative experiment study. Two types of qualitative analyses have been explained using thematic analysis through NVivo, which was conducted to evaluate the data collected during the focus group interviews from learners and in-situ interviews with the composition instructors. The analysis was used to test the hypothesis regarding how the learners found digital multimodal composition beneficial for their academic writing. The learners' focus group and instructor interviews were analysed retrospectively using the analysis proposed by Braun and Clarke (2019). Codes and subsequent themes were identified using this six-step method. During analysis, recurring themes in the initial codes were sought. These themes then guided us in refining the codes to be more targeted. The initial codes were grouped according to emerging themes to form more focused codes. These focused codes have been further aligned with aspects of the formative framework (Bradley & Reinking, 2011). The following section will present a detailed analysis of the formative framework's components and associated focused codes. There is a priori coding of learners' artefacts, interviews from learners and instructors, and the quantitative scoring of pre-and post-DMC prompt responses were evaluated and discussed according to what focused codes to add depth and richness to their analysis.

They complemented quantitative findings with qualitative data, further bolstering

their conclusions (Onwuegbuzie, 2012).

Quantitative Results

Hypothesis Testing

In statistical language, we would, for instance, evaluate the following hypothesis:

Ho: the average mean scores of the pretest = the average mean scores of the post-test

Or symbolically

Ho: $\mu_1 = \mu_2$

Here

μ_1 is representing the average mean scores of the pretest.

μ_2 *is* the average mean scores of the post-test

Table 4.1. *Paired Samples Statistics*

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretests	16.29	41	2.316	.362
	Post-tests	18.71	41	1.209	.189

Table 4.2. *Paired Samples Test*

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 pretests – post-tests	-2.415	1.923	.300	-3.022	-1.808	-8.039	40	.000

Table 4.2 reveals that accepting this study's alternative hypothesis, as the P-value

=0.000, means highly significant for this study. It interprets that there is a difference

between the learners' scores, and more critically, we can say that the difference

between the two means is negative (-2.415), which means that, on average, the

learners' academic writing performance improved beginning and after the

intervention. As is evident and complies with Table 4.1, the mean score of the pretest

(16.29) is smaller/lower than the mean score of the post-test (18.71). The statistical

analysis evaluates the essential variables available in the dataset to understand the

potential relationship between variables to investigate the effects of a DMC as an

intervention on argumentative writing skills, such as graphical representation (in the

next section), in terms of distribution and measurements of the central tendency. Pre-

and post-test scores of learners using visual rubrics have risen during the intervention.

Skill-wise Analysis of Learners' Results in Pre- and Post-intervention

The descriptive statistics of colour, images/graphics, font, layout/design, multimodal

orchestration, and the total score earned on these criteria concerning the visual rubric

before the intervention were given have been presented and discussed below:

Table 4.3. *Pre-Intervention Descriptive Statistics of Participants on Visual Rubric*

Criteria	Mean	Standard Deviation	Range
Colour	3.07	0.92	0 – 4
Images/Graphics	3.13	0.97	0 – 4
Font/Text	3.10	0.67	1 – 4
Design/Layout	3.02	0.73	1 – 4
Multimodal Orchestration	2.80	0.69	1 – 4
Earned Score	15.13	3.28	3 – 19

These results show that most respondents scored good to exceptional on

visual, image quality, graphics clarity, and relevance, and medium to good on

multimodality. The mean and standard deviation of the total score were 15.13 ± 3.28,

which showed that most of the respondents had scored between 11.9 and 18.4, which

can be ranked as a medium to good score. The descriptive statistics of colour,

images/graphic elements, design/layout, font, and multimodal orchestration, and the

total score earned on these criteria concerning the VG-informed visual rubric *(see*

Appendix A) after the intervention were given are summarised in Table 4.4.

Table 4.4. *Post-Intervention Descriptive Statistics of Participants on Visual Components*

Criteria	Mean	Standard Deviation	Range
Colour	3.55	0.78	1 – 4
Images/Graphics	3.53	0.75	1 – 4
Design/Layout	3.55	0.55	2 – 4
Font/Text	3.35	0.74	1 – 4
Multimodal Orchestration	3.25	0.74	1 – 4
Earned Score	17.20	2.80	6 – 20

These results show that most respondents scored good to exceptional in colour, images/graphic elements, design/layout, font/text, and multimodal orchestration. The mean and standard deviation of the total score were 17.20 ± 2.80, which showed that most respondents scored between 14.4 and 20.0, which can be ranked as good to exceptional. A notable difference can be seen in the lower and upper bounds of pre-intervention and post-intervention on the argumentative writing rubric. The lower bound at one standard deviation increased from 11.9 to 14.4, and the upper bound rose from 18.4 to 20.0. The mean difference between pre-and post-intervention criteria on the argumentative writing rubric is summarised in Table 4.5:

Table 4.5. *Pre- and Post-Intervention Differences on Visual Components*

Criteria	E	Standard Deviation	95% CI of Mean Difference
Colour	0.48	0.60	0.28 – 0.67
Images/Graphics	0.40	0.67	0.19 – 0.62
Font/Text	0.45	0.50	0.29 – 0.61
Design/Layout	0.33	0.57	0.14 – 0.51
Multimodal Orchestration	0.45	0.68	0.23 – 0.67
Earned Score	2.10	1.28	1.69 – 2.51

These results signify a positive mean change post-intervention, with the highest visual shift followed by font, text, and multimodal orchestration. A positive mean change of 2.10 can be noted in the total earned score in the post-intervention stage. The 95% CI of the mean difference for the total earned score shows that the post-intervention mean change score can vary between 1.69 and 2.51 in any other random sample.

Before applying the paired sample t-test to assess whether these differences were statistically significant, the skewness and kurtosis of the difference between pre- and post-intervention earned scores on the visual rubric and their standard errors were calculated to assess normality. The skewness value was -0.12 with a standard error of 0.37, while the kurtosis value was -1.04 with a standard error of 0.73. The skewness value divided by its standard error was between ±1.96, which was also true for the kurtosis value; the normal distribution can be assumed.

The results of the paired sample t-test showed that the post-intervention mean difference of 0.60 in colour was statistically significant, $t(39) = 5.02$, $p < .001$. For the same reason, the post-intervention mean difference of 0.40 in the use of colour and hue was also statistically significant, $t(39) = 3.77$, $p < .01$. For the font and text, the mean difference of 0.45 in post-intervention was statistically significant, $t(39) = 5.65$, $p < .001$. The mean difference in design/layout relevance after the intervention was also statistically significant, $MD = 0.33$, $t(39) = 3.59$, $p < .01$. Regarding multimodal orchestration, the mean difference of 0.45 in post-intervention was statistically significant, $t(39) = 0.45$, $p < .001$. The mean difference of 2.10 in overall earned score after the intervention was given was also statistically significant, $t(39) = 10.40$, $p < .001$. These results are presented visually in Graphs 4.1, 4.2, 4.3, 4.4, 4.5, and 4.6.

Graph 4.1: *Pre- and Post-Intervention Mean Differences in Colour and Hue in Blogposts*
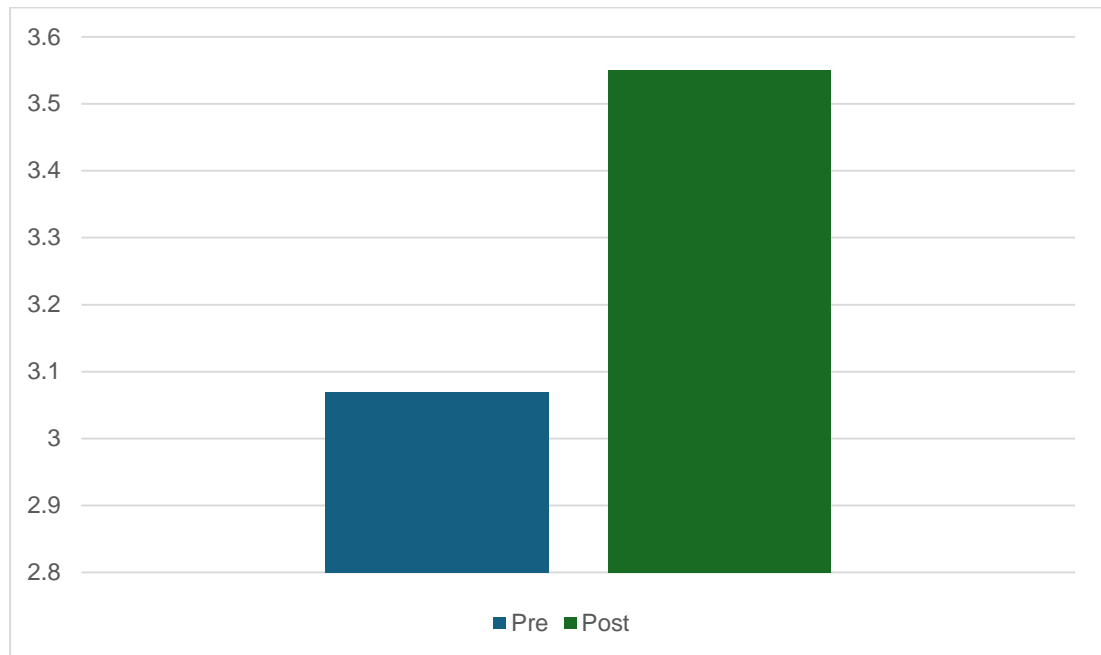
Graph 4.2: *Pre- and Post-Intervention Mean Differences in Image/Graphics in Blogposts*
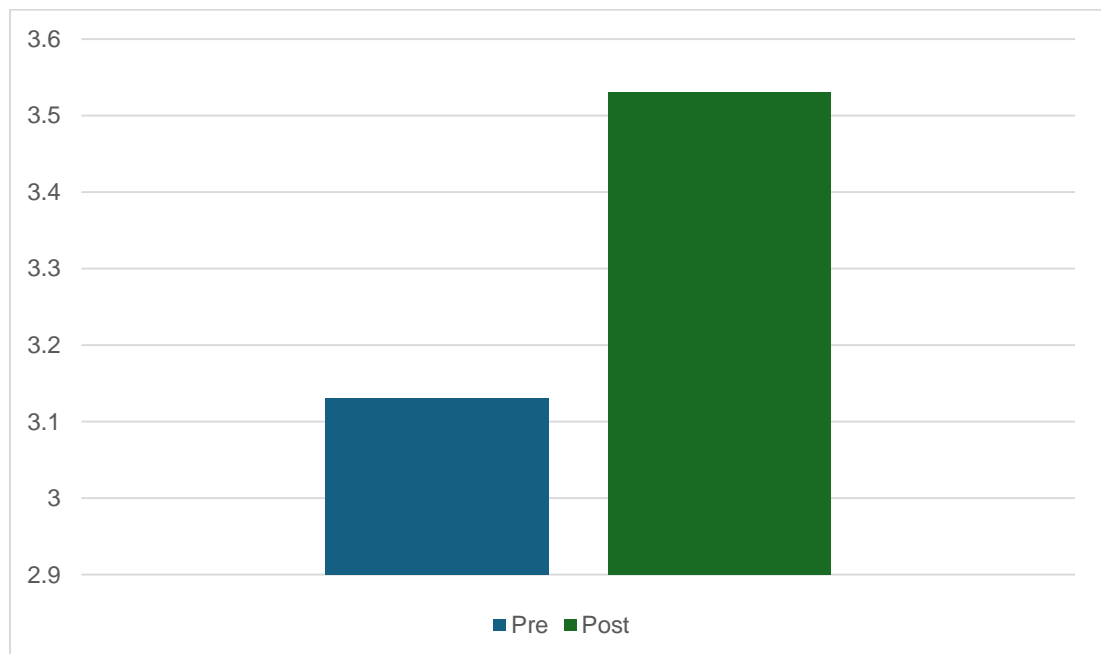
Graph 4.3: *Pre- and Post-Intervention Mean Difference in Font & Text*
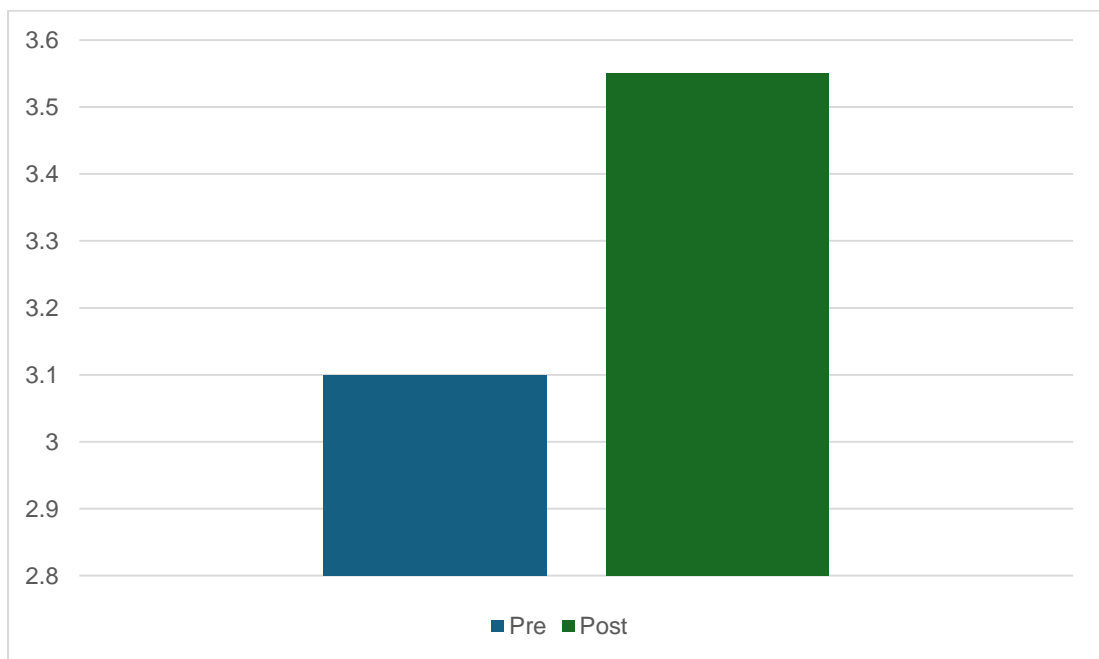
Graph 4.4: *Pre- and Post-Intervention Mean Difference in Design/Layout in Blogposts*
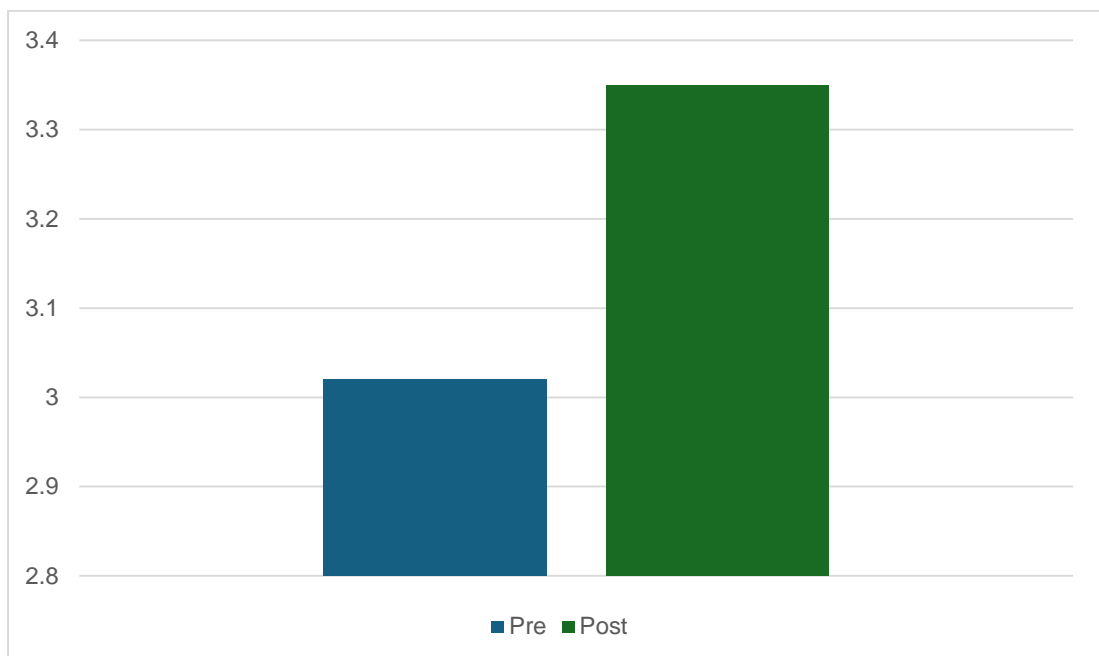
Graph 4.5: *Pre- and Post-Intervention Mean Difference in Multimodal Orchestration*
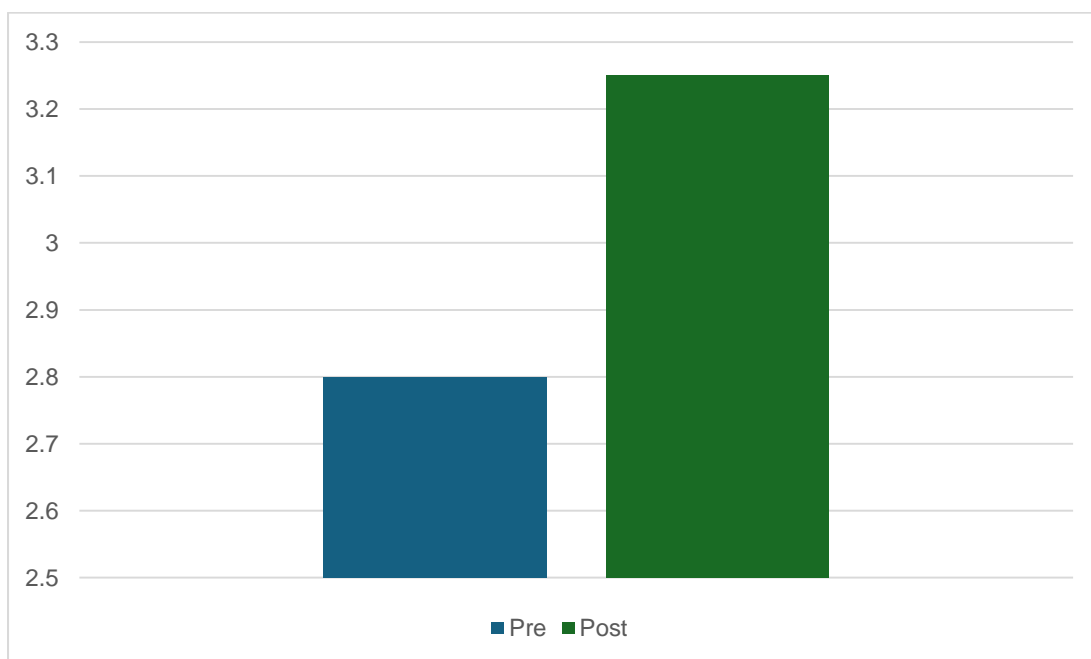
Graph 4.6: *Pre- and Post-Intervention Mean Difference in Overall Visual*

Representation Score
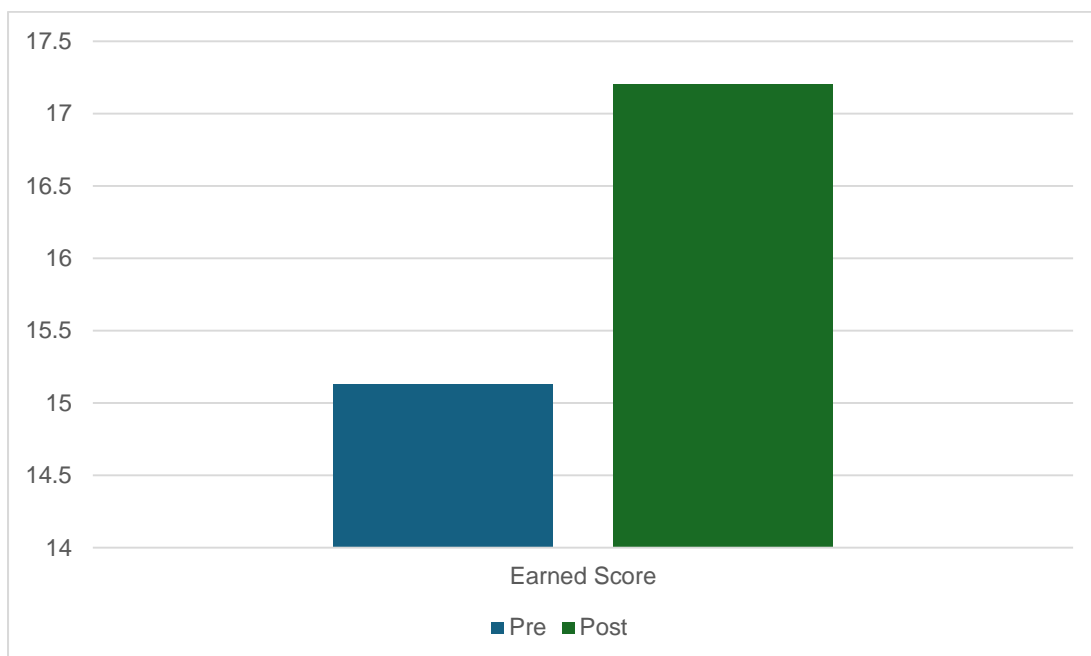
Summary of Quantitative Findings

There is a significant difference when comparing the mean score of the learner participants' level of argumentation before and after they attended the genre-based pedagogy argumentative writing course during a semester for an academic writing course. The analytical findings demonstrate that the intervention successfully raised argumentation scores at post-test one and post-test two of the testing process. Additionally, comparing the pre-test and post-test one and the pre-test and post-test two results, which show a statistically significant difference at each testing time, suggests that the participants' retention for argumentation was sustained over the two testing points. This result may be connected to some limitations included in the research, with the help of P-value = 0.000, which means the DMC intervention in the ESL context has been highly significant. Primarily, this study's one-semester intervention was most likely insufficient to make a discernible effect on how arguments were developed.

Furthermore, it is conceivable that the learners could have required extra time to get used to using the digital platform for both their own writing and review exchanges. According to statistical results, there was a statistically significant difference in argumentation between the pre-test and post-tests. These quantitative findings suggest that the genre-based instructional design for argumentative writing developed for Pakistani university learners positively impacts the increase of argumentation skills.

Qualitative Findings

Formative experiments are characterised by iterative data collection to improve an instructional intervention (Reinking & Bradley, 2008). The bounded study was based on genre-based pedagogical instruction intervention while incorporating digital

multimodal composition in an academic writing course comprising learner participants' final projects. Learners' generated DMC were analysed using an iterative process through conventions of multimodal social semiotics to examine the project's composition, the resources used, and the interplay between the modes. Continuous comparative analysis was employed throughout the data collection, transcription, and coding procedures that produced codes and subcodes (Corbin & Strauss, 2015). The interviews with learners were triangulated with their DMC projects to see how the DMC process took place in an ESL context. For thematic analysis, interviews with learners and instructors were analysed using NVivo Software because thematic analysis allowed for going beyond isolated responses and identifying the underlying structure of people's experiences and perspectives while unveiling patterns and making sense of the complex dataset.

Learners' Interest in Choosing the Topics. There has been a debate since the inception of this task on the selection of topics for the presentation of these topics, keeping learners' interests and their audience's interests and to pick on issues that have been prominent in their context that they find effective to give voice and advocate for those topics. TOEFL exam topics have been considered for producing these learner-generated digital multimodal compositions. So, these learners selected these topics after keeping in mind their interests and inclination toward exploring that topic in greater depth, and keeping in mind what their intended audience would find distinctly possible to interpret.

Contrarily, when learners were asked in their focus group interviews why they chose this topic over the others, they all agreed that their choice of topic had been an illustrious concern and should be given a voice by the academic community. As LLD

mentions, '*Making the content visually interesting and which helped me share my ideas more excitingly.*'

> *You can also include images like statistics in your Google Sites. So, if you need to illustrate your fact, you can copy-paste it into your blog, making it very easy to operate. Developing a better presentation on your multimodal blog is also easier than writing on paper.* (LLZ)
> *Google Sites topic centres around advocating for an increase in government public transportation services by developing into the matrices of transportation infrastructure I aim to highlight the societal benefits and the pressing need for enhanced public transit options this project allowed me to explore the intersection of civic responsibility and going into it is enforcing accessible and efficient transportation for all answering the Question-C, creating related blogs for future projects holds a genuine appeal for me the process of expressing ideas through digital platforms not only refines my writing skills but also provides a dynamic outlet for creativity as I envision undertaking diverse projects the prospect of crafting engaging blogs to accompany them is an exciting avenue for self-expression and knowledge dissemination in Question-E, I would like to say yes to writing a multimodal blog presents a unique set of challenges that distinguish it from traditional paper drafting the integration of various elements such as images videos and interactive features.* (LLU)

Kress (2010) posits that signs are created with two viewpoints and interests in mind, one of the producers and one of the addressees, concerning communication, the necessity of considering interests, and the demands of power concerning the representation and interests. The idea of the audience is primarily more relevant when it comes to Google Sites, as this interface has been designed to disseminate and publish a piece of information while keeping in mind its audience. Creating and designing these blogs was highly relevant.

> *This project allowed me to express my thoughts creatively and connect with a broader audience, which I find both challenging and rewarding. LLD*
> *I have inserted different stats, images, and memes to capture the audience's attention. LLA*
> *The theme is knowing who the audience is, so the weakest point of the DMC blog is that the lowest points are that I struggled with things like how one idea flows into the next and making the context stay the same throughout, but by presenting different ideas. LLA*

Analysis of Learners' DMC Artefacts

As Hiippala (2014) pointed out, none of the analytical layers in the GeM model can describe an artefact's multimodal structure alone. Instead, crossed-layered analyses are permitted and are required to pinpoint relevant semiotic choices that characterise multimodal blogposts as an artefact. Bateman (2008) has not theoretically defined any specific relationships between the analytical layers, leaving these *'open to empirical investigation.'* Moreover, the analytical layers are not restricted to the four mentioned; analysts may add additional independent layers or delete them if needed. I will focus solely on the content, layout, navigation, and rhetorical analytical levels within the GeM model, which I will explain in detail in the following section. I annotated data manually and accessed this data using GeM cross-media comparison, as suggested by Hiippala (2017). Bateman *et al*. (2007) introduced such a comparison and named this concept *'genre mapping'* when comparing front pages in print newspapers and digital news websites. According to them, mapping genre differences allows analysts to outline dimensions within the genre space, a critical step in accounting for variability, specifically, the range of choices available in page-based documents.

Focusing on these factors within each analytical level captures the nuances of multimodal communication in blogpost data. However, it is essential to address this concern, the rationale for accessing data manually, and the straightforward answer would be to promote broader adoption of the GeM framework; efforts should focus on making its application more concise and more efficient, as Hiippala (2017) suggested. Given the prevalence of web-based digital services, it is a promising approach to develop a web-based interface that offers tools for automatic annotation (Würsch *et al*., 2017). Such a platform could leverage modern web technologies to facilitate collaborative annotation, enabling annotators to divide tasks and annotate artefacts

incrementally. However, the scope of the research was not meant to generate computer-based annotations and corpus-driven data but to manually annotate data that would help understand the contextual accuracy and maintain domain-specific information; computer-generated annotations might lack the precision needed due to limited training examples. Humans interpret the relationships between different elements more accurately when dealing with multimodal data that combines text, images, and layout (like the data in the GeM framework). This is crucial when studying how different media elements interact to convey meaning, which is often challenging for automated systems to replicate. With manual annotation, the researcher ensures that the annotation guidelines are followed precisely, especially if the guidelines require subjective interpretation. This framework allows for the exploration of both linguistic and non-linguistic modes, in alignment with the study's DMC foundation and SDG-4's emphasis on inclusive and quality learning. Therefore, manual annotation served the purpose of the research with the GeM framework. Overall, it has been illustrated how the framework offers a systematic approach to describing multimodal documents using manual annotation for a page-based artefact.

DMC Data from the Research Participants
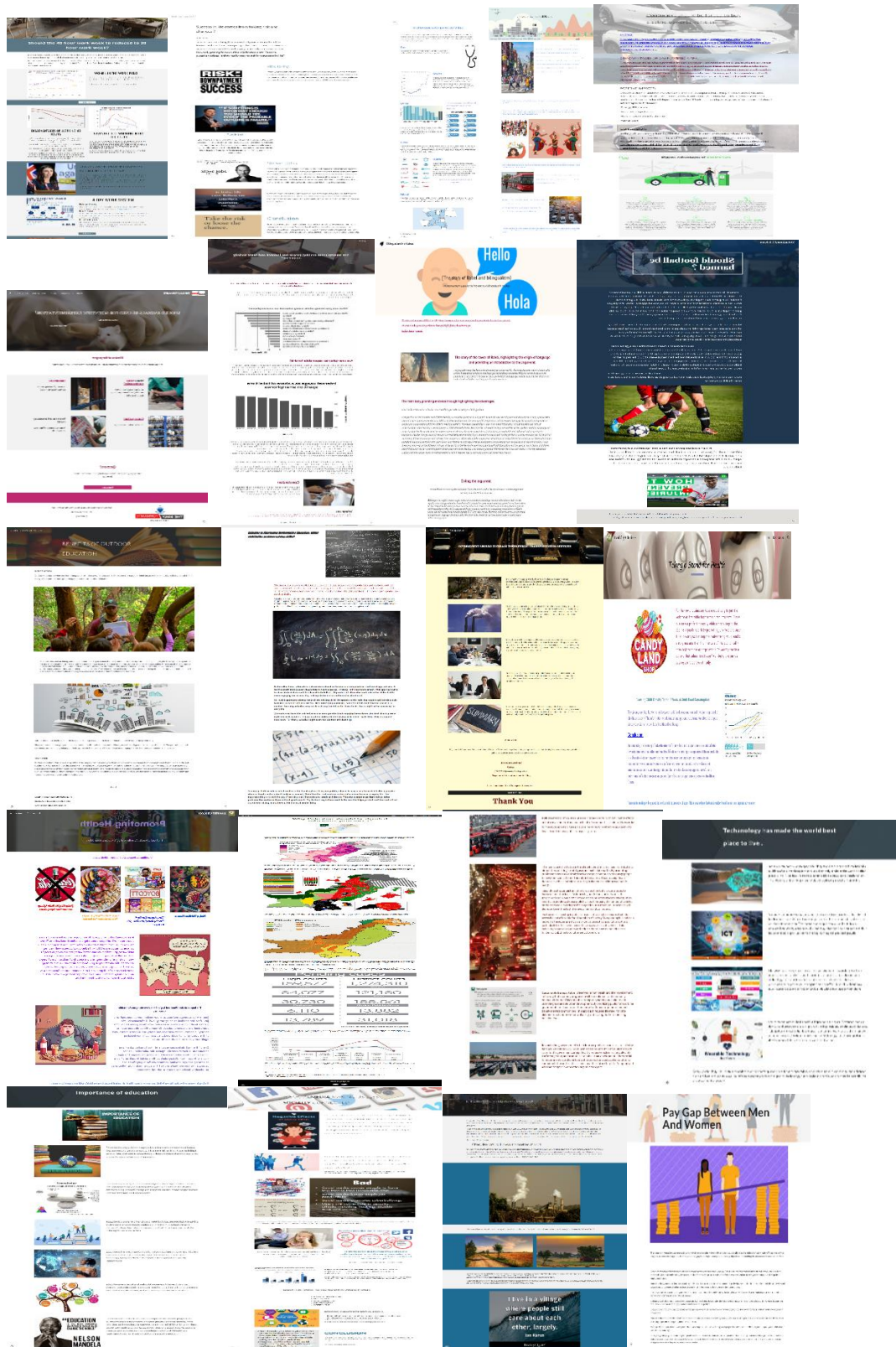
Figure 4.1: *Collage of Learners' Generated DMCs*

Blogpost as a Medium for Multimodal Artefact

The research uses manual annotation to identify the preferred choices within learners' digital multimodal compositions, which may offer insights into their characteristics as academic texts in an ESL context. The GeM framework will be applied to the data, focusing on semiotic modes. Additionally, it is essential to introduce new analytical perspectives by integrating information from multiple layers of analysis. The analysis will follow a logical sequence, starting with the medium, progressing to the semiotic modes, and culminating in their interpretation. The step-by-step approach will help uncover each element's contribution to the multimodal artefact's overall structure.

Defining a medium is challenging due to its frequent use across academic discourse and everyday contexts. Terms like print, digital, and social media are commonly referenced. To enhance the analytical value of the concept, it is crucial to explore why the medium plays a critical role in describing the structure of a multimodal artefact. Bateman (2015) views the medium as a historically stabilised platform for deploying specific semiotic modes to fulfil various communicative purposes. For instance, print media encompasses newspapers, books, magazines, blogposts, and landing pages. Each of these media tends to favour semiotic modes; furthermore, the genre of the medium influences which semiotic choices are prioritised. As part of a rhetorical strategy, these choices are considered appropriate to the genre's conventions and communicative objectives (Hiippala, 2014).

At this point, it is essential to contrast the genre of learner-generated blogs with the medium of academic blogging. The central question is: does the medium offer more than just a material platform for realising the genre? Bateman (2016) argues that features such as page numbers, text spacing, paragraphing, and the intentional use of margins do not directly shape the multimodal genre structure

(Bateman, 2016). Their presence, absence, form, or placement is not inherently tied to any specific genre. Instead, these features arise from the practical requirements of pagination and layout, which are how content is organised on a page and appears across genres within the same medium (Bunton, 2005; Paltridge, 2001).

For example, consider this page as part of the genre of a doctoral dissertation, which is realised within the medium of a book. Here, pagination, layout, and formatting features are not genre-specific but serve to structure and support the content. These features perform an essential function within the multimodal artefact, complementing the content they organise. To conflate these structural elements into a single analytical layer would misrepresent the unique contributions of both the genre and the medium. In a multimodal artefact, the medium, the semiotic modes, and the genre each play distinct roles that need to be disentangled for practical analysis. The study aims to identify how these elements interact to produce a multimodal artefact. Specifically, by focusing on mapping the distribution of verbal and visual content within the learner-generated blogs and highlighting trends suggesting a preference for the visual, the analysis will explore whether this assumption holds in the data and what implications it may have for the structure of a multimodal artefact in an academic context.

Interactivity refers to a digital affordance within a digital text that enables embedded signs or sites, such as buttons, hyperlinks, or icons, to be realised in different modes. Adami (2015) presents a framework for such interactivity in a webpage that allows users to add potentially interactive components and distinguishes how valuable a webpage's interactive potential is. Word-based signs and sites are typically viewed as the least interactive, whereas dynamicity is a marker of highly perceived interaction. Therefore, compared to other learners, the arrangement of some

learners' interactive sites communicates a higher level of interactive aesthetics on the page. The degree of interaction is correlated with knowledge, technology, and up-to-dateness. This reinforces the contrast between the old and new layout orientation and other aesthetic meaning potentials of the overall modal configuration.

The learners have used this interactivity affordance in their blogs by using hyperlinks that lead to another illustrious yet relevant interface, advocating their message to the discourse communities. References have been embedded in this blogpost at two points, indicating that there are eminent sites that add interactivity to this LLB blogpost. LLA used interactive images in her blogpost. Contrarily, the blogpost that the image is from may be interactive. Nevertheless, there is less interactivity as there is no hyperlink or space for the readers to leave a comment. LLF's blog uses interactive elements, such as allowing its readers to leave comments to share their opinions and suggestions; it is also referred to as a blogpost from YouTube, making it highly interactive. The LLL blogpost used references as interactive elements and embedded them into the blogpost. Interestingly, all learners mentioned that their emails referring to not closely embedding would make it interactive, primarily because they are interested in contacting their potential readers. One of the blogs by LLD has been highly interactive, with plenty of embedded links, and each link leads to another new interface, inviting readers to act.

Visual Rhetoric in Multimodal Argumentation

The study explores the shift towards visual elements in communication, often called the *'visual turn,'* which has gained attention across different academic fields (e.g., Kress *et al*., 1998; Mitchell, 2009). The analysis focuses on multimodal communication (combining visual and verbal elements), and the study, using data from learner-generated digital multimodal composition (DMC), identifies visual

content through the presence of alt attributes indicating images, and the types of images containing photos, illustrations, and maps quantified in the layout structure of these DMCs. In the manually annotated corpus, the visuals have been captured based on the occurrence of graphic elements and the layout area occupied by these elements (Tseronis, 2021). It shows that visuals tend to occupy at the time half of the space in these learners-generated DMCs, indicating that there has been a tendency towards visual rhetoric for conveying arguments and contextual information. The research notes a need to examine the degree of integration between visual and verbal content, where both components could share communicative tasks effectively without one mode dominating (Tseronis, 2018).

The study highlights that more extensive data sets would benefit from a comprehensive investigation into visual rhetoric. The analysis also underlines the importance of teaching critical multimodal literacy, raising questions about the balance between teaching visual interpretation and the combination of verbal and visual content. Addressing these issues requires interdisciplinary insights and empirical data, especially as technological advances continue to shape multimodal communication production. It is also essential to recognise that reworking a blogpost's visual presentation may involve modifying its multimodal structure, including layout and rhetorical organisation. This section has established a foundation for further analysis of learner-generated digital multimodal content (DMC) as a multimodal artefact. Understanding the distinctive features of these DMCs is crucial as a precursor to examining their multimodal structure in the following analysis. The attributes of this medium are essential for identifying and differentiating the various elements that contribute to the multimodal composition of academic blogs created by learners.

Visual rhetoric, connected to traditional rhetoric, offers a lens within a theoretical context that focuses on how images convey meaning. While *'rhetoric'* is usually tied to language and persuasion, *'visual'* suggests a form of seeing that can be understood as a way of looking (Sturken & Cartwright, 2009). Since images gain meaning through cultural contexts, visual rhetoric draws on concepts from a visual culture that analyses the agency of creators and audiences and the role of images alongside other modes by considering how discourse communities intersect (Kostelnick & Hassett, 2003). In this sense, visual rhetoric supports an analysis of both the visual and verbal components of texts, such as learner-generated digital multimodal compositions. Such visual culture through rhetoric provides insight into the relationship between the resource's learners leveraged for meaning-making across ESL academic writing contexts that engage with visuality's social and cultural dimensions. Evolving from cultural studies, visual culture emphasises the sociocultural significance of visuality and the practices of looking (Sturken & Cartwright, 2009). Terms like the *'pictorial turn'* (Mitchell, 2009) and the *'visual turn'* (Jay, 2002) highlight visuality as a mode of communication and meaning-making that facilitates a critical exploration of how visuals function within multimodality to convey and create meaning. In an educational context, its primary objective is *'showing seeing'* (Mitchell, 2002). The question that arises is how learners experience the process of digital multimodal composition in an ESL context and when technology and multimodal composing practices are integrated into an academic writing curriculum focused on composition, as well as social, academic, and visual language merging. From the data under scrutiny, three essential aspects emerged through the lens of visual rhetoric: resources, process, and awareness.

In this digital multimodal composition process, resources refer to the abilities, strengths, and experiences that learners contributed to the composition process. Social semiotics' concept of *'Available Resources'* refers to the social and cultural symbols that members of a community use to communicate (Kress, 2009). The driving principle behind using any resource in this digital multimodal composing was rhetorical. The learners in the class had a clear purpose and audience in mind, and they drew on multiple resources to convey their messages within their academic ESL community. LL6 notes the following while integrating DMC into their argumentative writing blogs:

> *Each element that one integrates, any picture, any video, or any image or interactive element, should serve a purpose and enhance the meaning of your work. It should not be out of your context. (LL6)*

> *This project allowed me to express my thoughts creatively and connect with a wider audience, which I find both challenging and rewarding. (LL2)*

> *His project allowed me to express my thoughts creatively and connect with a wider audience. (LL11)*

> *It is crucial to articulate and support a convincing argument with relevant organisations and awareness of the target audience to ensure the project's success. (LL2)*

> *Its goal is to convince the audience of the validity of the writer's position. It provides both the positive and negative aspects of a particular viewpoint. It has aspects like pattern, like the first introduction, then the body paragraph, then counterarguments, and all the evidence that provides a strong viewpoint to convince the audience. (LL1)*

> *I designed the content carefully, planned, and organised, considering the multimodal elements to convey my message effectively and explore diverse modes to engage the academic audience. (LL4)*

> *I designed my multimodal composition project and planned visuals and textual elements, ensuring they complement each other to convey a cohesive message and emphasise the importance of a clearer purpose and audience awareness for effective communication in multimodal text. (LL7)*

Another learner, LL6, states the following:

> *Multimodal composition projects carefully plan their visuals and textual elements, ensuring they complement each other to convey a cohesive message and emphasise the importance of a player's purpose and audience awareness for effective communication in multimodal text. (LL6)*

Another learner, LL4, stated the following:

> *I understood critical thinking, audience awareness, and how we should provide a particular viewpoint to convince the audience. (LL4)*

Resources emerged in complex ways in learners' DMC artefacts and interviews. Social and academic languages were identifiable through conventions employed in argumentative writing following Toulmin's Model of Argumentation (1958). Their objective had to be communicated through both the visual and verbal languages they used. Additionally, resources were drawn from various discourse communities that shared meaning across social boundaries and were specific to academic contexts and subgroups. Their resources all demonstrated seamless integration of different digital literacies. Conventions are how things are usually done, particularly in certain cultures and social groups. People maintain memberships in multiple communities (Gee, 2014; Kostelnick & Hassett, 2003; Latour, 2007) and present as different *'kinds of people'* in various contexts (Gee, 2014). Communities promote fluencies in unique codes, such as verbal and visual codes (Kostelnick & Hassett, 2003). Visual fluencies were demonstrated in how learners presented content related to popular culture in their digital multimodal compositions. For example, they used semiotic resources without clarification, such as images, graphs, or infographics.

> *What background colour do you have to set, what image do you have to add, where do you have to add it, and is the research that you are using authentic or not? It helped me plan and execute argumentative writing and express my creativity through visuals and graphics. (LL5)*

The DMC project language choices used by learners represented learners' affiliation in diverse discourse communities. There are many distinct ways in which memberships in different communities overlap and intersect. In the DMC, learners were directed to use digital applications such as Google Sites, and they drew on their previous social media usage and languages of their daily lives for an academic writing class. Consequently, as illustrated in Figure 4.2 below, this DMC project shaped the

conditions for the intersection of academic discipline, various social and academic cultures, and the institution's context within an organisation.

Figure 4.2: *Typical membership in multiple, overlapping discourse communities (Kostelnick & Hassett, 2003)*

Conventions have the potential to encourage creativity and nurture, and not inhibit innovation because these conventions evolve with usage and are not set in stone; they change through use (Kostelnick & Hassett, 2003). Conventions are visible to audiences, so they know what to anticipate, yet original or non-obvious methods indicate innovation (Grant, 2013). Learners used conventions from genres specific to argumentative writing using Toulmin's model of argumentation (1958) and academic language to communicate a message directed primarily at peers but also for educational purposes while using Google Sites to publish.

There are many examples of Learners drawing on social languages to support their rhetorical intentions. They drew on multiple social issues in their blogposts to communicate what they believed, supported by their knowledge of social languages and conventions through which they use visual language and how their social language included visual languages or vice versa. Many learners agreed that their thinking about how the images and words complement each other had been aptly demonstrated through their DMCs.

This project helped me understand how we can connect ourselves with digital media in the digital world. (LL5)

Learners' writing was carefully crafted. The organisation of the argument followed careful logic, presenting both sides of an argument about the benefits and drawbacks of the topics they covered. Their DMCs followed a rhetorical intention to present something peculiar about their social surroundings concerning technology. The following excerpts from various learner interviews demonstrate the resources they brought to the digital composing process, including academic writing proficiency and the ability to use visuals to achieve their rhetorical goals effectively.

I have structured the writing part according to Toulmin's model of argument. I have tried to cover all the points and use counterarguments and qualifiers to support the argument and make it more relatable to the readers. (LL9)

My understanding of argumentative writing likely involves presenting a clear position on a topic, providing evidence to support my claim, and persuading the reader through logical reasoning. And demonstrating a well-structured and corresponding line of thought. (LL12)

I learned how to structure an argumentative essay properly, create content-related designs, and always use attention-catching words, phrases, fonts, and colours. (LL15)

It involves the skill of presenting a cohesive and processive argument using multiple modes of communication. This may include combining written text with visual elements such as images or graphs to enhance the overall impact of your arguments. In this type of writing, we usually collect and present evidence that allows the reader to decide on the discussed topic. (LL24)

While writing a multimodal blog on this topic represents unique challenges, I find it equally difficult as traditional drafting of a paper. (LL8)

I learned how to apply Toulmin's model in argumentation. (LL17)

In an argumentative essay, an author takes a stance on a specific issue and presents arguments to support that stance. It involves research evidence to convince readers of the validity of the writer's perspective. (LL19)

Argumentative writing is where the writer takes a stance on a specific topic and goes through it with facts and their perspective, using extensive research, evidence, and persuasive language. (LL20)

Argumentative writing is an important genre-specific convention in learners'

DMC blogposts. Understanding the conventions helped them meet the genre's

expectations from their audience's perspective. Consciously crafted conventions lead

to innovation (Kostelnick & Hassett, 2003). Audiences familiar with a particular

genre anticipate specific characteristics but also derive aesthetic enjoyment from

encountering innovative approaches (Grant, 2013; Mihaly, 2013). The resources

derived from various discourses within the intersecting communities of peer groups

and the educational environment helped learners develop unique and exciting

multimodal arguments.

> *Argumentative writing involves presenting a clear and persuasive argument on a specific topic by considering various perspectives, data, and ethical considerations. Overall, it involves presenting a well-reasoned position supported by evidence and addressing counterarguments to persuade the audience. (LL21)*

> *It presented a well-reasoned argument supported by research and advocates for responsible regulation of potential harm. (LL18)*

> *Emphasise the importance of thorough research, acknowledging different perspectives, and presenting a nuanced argument. They should also consider the audience's perspective and incorporate diverse modes of expression to enhance the overall impact of the composition. (LL22)*

> *I was reading different articles, and I just, you know, liked designing the overall blogpost. It was quite fun. (LL22)*

> *Writing a multimodal blog is more difficult than drafting a paper. Because of the complexity of combining different media types, the time required to master various tools for multimedia integration, and the need for visual design skills. (LL14)*

Discourses communicate through intertextuality (Cope & Kalantzis, 2000).

These discourses interact with and draw on dominant or mainstream discourses, like

academic or content-specific discourses, but they can also be subcultural, like

conventions that learners present from their prior knowledge. It is crucial to remember

that discourses interact to shape one another (Cope & Kalantzis, 2000). Learners used

their knowledge of argumentative writing conventions learned during genre pedagogy

and drew on contextual understanding to communicate their perspectives to peers and a broader academic audience. Capitalising on the outsider perspective, in writing and visual rhetoric, they used different approaches and drew on amplification to make a point about the argument sound convincing to their audience.

In academic arguments, intertextuality is interdependent and helps unlock meaning through visual and verbal modes. In such multimodal arguments, verbal language provides a general direction for interpreting the visual, whereas visual language offers an analogy through a pop culture reference. The use of intertextuality, as this term describes how a text references another text, allows the readers to draw on references with clear markers, for instance, explicitly, quotation marks (common in written text), which have been referred to as manifest intertextuality by Fairclough (1992), that also challenges in multimodal arguments their audience's knowledge. This is one way of shifting responsibility, in that the audiences are solely responsible for understanding hidden references. According to Adami (2016), a rhetoric of the implicit shapes the politics of communication in an elitist way in the age of copy-and-paste, absolving sign-makers of the need to be explicit, clear, cohesive, and coherent while placing the blame for communicative success or failure on meaning-makers. In this instance, the producers' use of famous beverages and snack brands echoes Williams's (2015, 2016) findings that there is a belief among aspiring composers that audiences and peers can rely on popular culture contexts and traditions as shared references.

In addition to language, visuals are used to create affinity. Archer (2013) says that employing imagery that the target audience is familiar with might help develop a closer social gap. Blogpost-LLB responds to a specific prompt. A familiar atmosphere is created by intertextual references to the blogpost's images together with references

to famous personalities around the world, such as the Prime Minister of New Zealand's image (see Figure 4.3 below), and intertextual allusions to materials from popular culture, for instance, famous beverages and snacks brands, Coca-Cola and Candyland (see Figure 4.4 below). A sign maker's choices significantly impact how well people receive and understand the information on a sign (Archer, 2013). These resources promote a favourable response to the argument since the audience can relate to the individuals and social events on the screen.
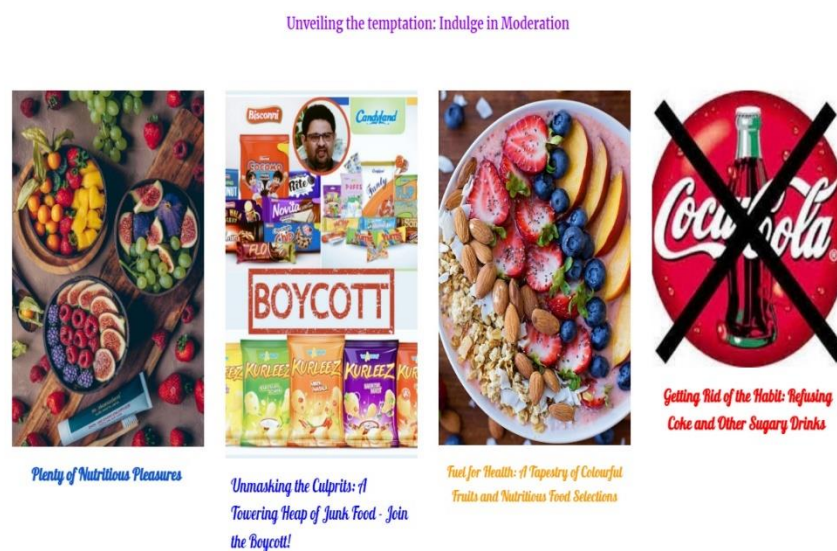
Figure 4.3: *Intertextuality in the Blogpost*
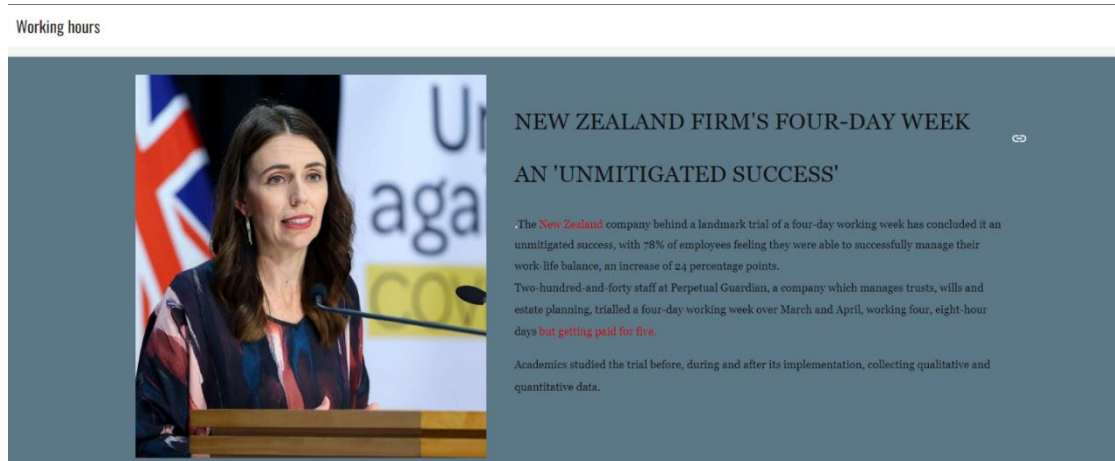
Figure 4.4: *Intertextuality in the Blogpost*

Academic learners use citations to establish credibility, which means gaining the reader's trust. These selected blogposts have employed citations to establish credibility for their academic audience. Academic citations in academic essays prove that the author acknowledges sources by mentioning the author and their expertise in the field. Nevertheless, Johnson-Eilola and Selber (2007) argue that focusing on originality in learner writing can lead to plagiarism. Learners might hide their sources because citations are seen as less valuable than original work. They suggest we rethink citation practices and propose valuing *'remix'* or *'assemblage'* in learner writing. This means creating text by reusing existing sources explicitly. For such assessment and remixing, instructors could then emphasise finding reliable source materials for an assemblage for such multimodal digital texts, and it will help twofold: first, to nurture the originality of the learners, and second, learners would confidently present their citations. These citations are a tool for effective creation instead of merely acknowledging these sources. By valuing assemblage skills and the function of reused content, we remove the pressure to hide sources and encourage learners to find excellent source material (Johnson-Eilola & Selber, 2007). Intertextual referencing has been used to establish ethos in the learners' generated digital multimodal arguments. Referencing has been widely used in academia to acknowledge sources, incorporate ideas, and give credit to those sources through citations. In digital blogposts, this device has been used for hyperlink functions that enable learners to create their blogposts and link their blogs with other digital texts, sites, and videos by clicking a button. These Google blogposts link to various documents and websites, all supported by the hyperlink. Such a network of hyperlinks generates several opportunities for intertextual references to appear.

The DMC data revealed three main themes: resources, process, and awareness, each intersecting and connecting at fluid, shifting points. A starting point was highlighting the resources learners brought into the composing process. These resources were drawn from diverse discourses to communicate aspects of identity for an audience from various communities. Learners negotiated and organised their resources in the process theme, tailoring them for a unique rhetorical situation. Awareness encompassed their choices in using linguistic and visual resources and social conventions to leverage these resources for their DMC blogposts. Most blogposts demonstrated how social languages serve rhetorical purposes, allowing learners to connect meaningfully with their audience. Social conventions often internalise and subconsciously structure learners' DMCs using visual and multimodal elements. In today's world, the visual is dominant. Mitchell (2002) asserted, *'To live in any culture is to live in a visual culture.'* Visuality extends beyond biological sight, encompassing social practices and multisensory experiences (Mitchell, 2002). Thus, looking replaces seeing (Sturken & Cartwright, 2009).

Visual elements provide a starting point, anchoring rhetorical approaches in a digital age. However, scholars of visual rhetoric have recognised that visuals are part of a multimodal meaning-making process (Handa, 2004; Rose, 2022). While some advocate for a distinct language for interpreting images (Kostelnick & Hassett, 2003; O'Toole, 1994) and grammars for multimodality (Kress, 2009; Kress & Leeuwen, 2001), traditional and visual rhetoric share many overlapping terms and concepts. Though words and images fundamentally differ in communication (Kostelnick & Hassett, 2003), rhetoric establishes meaningful connections. This analysis takes us to the next step of realising the genric structure in DMC in the context of constraints following the GeM framework.

Constraints in Consumption and Production in Realisation of Generic Structure

in Digital Multimodal Blogposts

Genre constraints in content production, specifically for a single-page format like an encyclopaedia entry, where all information fits on one side of the page. This format affects navigation and layout, with the main content positioned in the top left to align with conventional reading habits. The text should be simple and engaging for young readers, using familiar comparisons and vibrant visuals to support easy navigation. Production constraints include limited space due to the one-page format, template restrictions (e.g., on Google Sites), and the necessity to design for accessibility, which impacts the layout and features. Consumption constraints also affect the design, as the content needs to be concise for readers with limited attention spans and adaptable to different devices and screen sizes. Positive user experience is emphasised through intuitive navigation and readability.

The GeM model's layout layer allows in-depth analysis of layout structures in list-driven formats. For example, headers and typographic emphasis clarify the page's structure. The paragraphs introduce the topic, describe data, and provide a rationale, which can be broken down into finer rhetorical structures. Characterised by its flexibility, this modular text-flow structure could introduce several topics using the same layout principles (Waller, 1987). In this example, the paragraphs serve to introduce the subject in general, then describe the topic, followed by presenting data, and lastly, provide supporting grounds. These paragraphs can be further broken down into microstructures consisting of RST (Rhetorical Structure Theory) segments and their interconnections (Longacre, 1992). From here, the analysis could extend to the lexico-grammatical level (Hiippala, 2007). The paragraphs and their segments

demonstrate the flexibility and potential of text-flow, showing that the same structural pattern could effectively introduce entirely different topics.

Academic blogposts as a genre in an academic context have been studied, but still need investigation (Zou & Hyland, 2019). Hasan (1978: 229) states genre as a '*type of discourse, a generalised structural formula, which permits an array of actual structures*' and introduces the concept of contextual configuration, which is related to (Halliday, 1978) register variables of field, tenor, and mode. Hasan's (1978, 1984/1996) and Ventola's (1984, 2012) genre perspectives suggest that the values within a specific social context's contextual configuration predict the structural pattern (SP), encompassing functional elements and their sequence. Therefore, a genre is represented by its Generic Structure Potential (GSP), which outlines the required and optional components a text needs to include to fit within that genre. The GSP for a genre is the sequential representation of these elements in an allowed order. The study of multimodal genres has faced challenges in adapting traditional genre theories, such as Hasan's GSP, Ventola's (1984, 1987) flowchart notations, and Martin's (1992) genre model within SFL, as well as genre definitions from other traditions, like Miller's (1994) and Swales' (1990) works.

These theories often emphasise a linear, phased structure, making them less applicable to multimodal genres where communication is multidimensional and does not unfold in a single sequence of space or time (Bateman, 2014). Despite these limitations, understanding genre as a staged, purposeful process remains foundational across genre studies (Bateman, 2008, 2012, 2014, 2016). Bateman (2014) defines a multimodal genre as a structured and temporarily stabilised *'bundle'* of communication strategies among a community. This approach considers genre in relation to the semiotic modes involved, where a mode includes a material substrate,

semiotic resources, and discourse semantics (Hiippala, 2014). Bateman (2008) asserts that genre cannot be determined without identifying the deployed modes, as genres are composed of rhetorical strategies shaped by the medium's semiotic modes (Bateman, 2014). Thus, multimodal genres consist of multidimensional, repeated practices that appear across cultural artefacts. This leads to a topological approach where genres are mapped by proximity based on similarities in rhetorical strategies and semantic features, allowing for a multilinear, probabilistic approach to understanding the relationships and sequential possibilities of verbal and visual forms (Lemke, 1998; Bateman, 2008).

Content Structure in Blogposts

The analysis offers a detailed examination of content and structure within the learners' DMC data. Here, it focuses on semiotic modes to identify where critical choices influencing the structure of a multimodal artefact are made. Language and image play crucial roles in constructing a mental image, making it essential to analyse the semiotic modes used to convey content closely. Additionally, it is helpful to revisit the model of the academic blogpost as a genre, with its distinct communicative objectives. The aim is to determine whether specific semiotic modes are directed explicitly at fulfilling communicative goals as part of a broader rhetorical strategy (Bateman, 2016). If so, it is intended to uncover how these semiotic modes achieve this by systematically deconstructing each mode. The following section examines text-flow, a foundational language-based semiotic mode following the GeM framework. Wysocki (2004) contends that *'compositions only ever work within and as part of other, already existing, structures and practices' and 'innovative technologies do not automatically erase, overthrow, or change old practices.'* Google Sites allowed blank slides and templates as two methods for designing layouts. Google

Sites' default interface allows users to select themes, colours, layouts, and page layering as embedded templates. This enables users to use these templates to choose socially acceptable layout design techniques. The learners constructed blogs using Google Sites and exhibited the possibility of using this option by composing their sites and presenting their arguments in unconventional ways. Exposition can be differentiated by colour scheme in addition to content. Next, we will understand text flow using the rhetorical and content layers in the GeM framework.

Argumentation following Toulmin's Model – Understanding Text-Flow

The semiotic mode of text-flow leverages the full meaning potential of language, making it versatile for various communicative contexts. This section analyses the structure and functions of text-flow within the learners' generated digital multimodal compositions (DMCs). Specifically, it examines the type of content conveyed through text-flow and the structuring of blogpost content based on Toulmin's Model (1958). The model is widely recognised, especially in rhetoric, logic, and computer science, as it clarifies and rationalises argumentation more effectively than traditional syllogistic reasoning. Much like Rhetorical Structure Theory (RST), which has gained traction among linguists, rhetoricians, and computer scientists, the model enhances the transparency of argumentative structures.

To address these questions, the primary data source is the rhetorical layer of the GeM framework, complemented by layout layer data to outline the hierarchical structure of the DMC artefacts. This approach allows for analysing the rhetorical structure within its contextual setting, such as paragraphs or other layout units. A multimodal artefact structure model helps identify these clauses' roles concerning other page elements, where they may serve as titles, captions, or integral parts of

linguistic content. Expanding the analysis across the full multimodal page reveals the need to comprehend the discursive roles of each text segment.

The rhetorical structure of the text, both textual and graphical elements, shows how content is argued and how various segments are interconnected textually. To analyse the rhetorical structure, traditional rhetoric relies on the Rhetorical Structure Theory (RST) by Mann and Thompson (1988), which offers a framework and notation to express the hierarchical relationships among text segments, supporting coherent text presentation. Nash (1980) also proposed a limited set of rhetorical structures that documents can follow. For the present analysis, Toulmin's Model of Argumentation (1958) has been used to study the rhetorical discourse structure of argumentation. The rhetorical structure aims to guide how the individual genre stages have been achieved in these digital multimodal compositions.
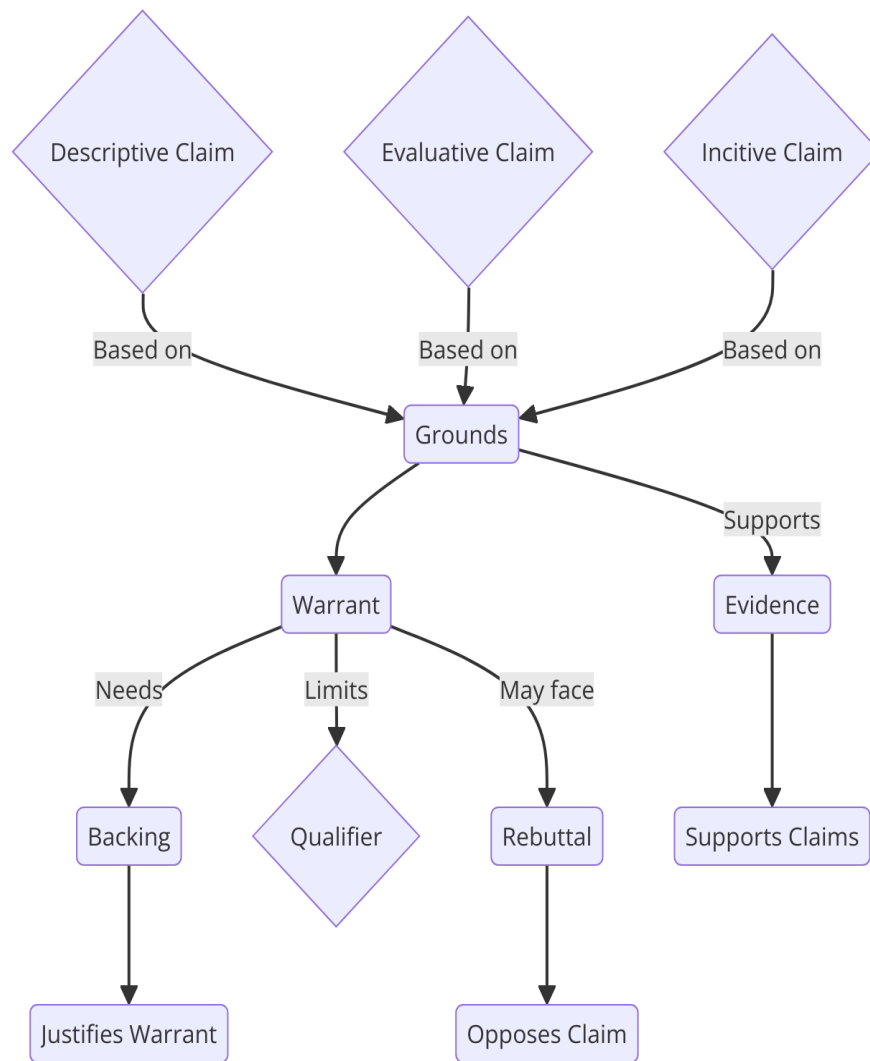
Figure 4.5: *Toulmin's Model of Argumentation (1958)*

One of the blogposts argues that a four-day workweek could be the future, with grounds for supporting graphs and illustrations that suggest shorter workweeks increase productivity. In warrants, it provides how a four-day work week leads to positive outcomes. It backed up the data with examples from other countries, such as New Zealand, where it has already been implemented. However, rebuttal and qualifiers were not mentioned. For qualifiers, the learner mentioned subtly how a shorter week could be conducive for females, and it depends on the employee's preferences. It rebuts how this claim could not be valid in specific contexts and situations. In another blogpost titled *'Should Animals Be Used for Scientific*

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Experimentation?' The claim is to argue and provide evidence that conducting experiments on animals is not justified, suggesting that the purpose was to present various aspects of the claim. It supported the claim on the grounds against using animals in experiments by projecting visuals containing caged rabbits, as the sub-heading 'cruel or justified' implied the potential of cruel treatment and animal suffering. The DMC blogpost provided data on animal cruelty and experimentation in various laboratories. It provided warrants for the greater good; such experiments have benefited, at all events, from causing animal injuries. Researchers use animals to learn more about the diseases and infections that plague today's world, both human and animal, and to affirm the safety of new medical treatments. Unfortunately, some of these issues involve studying a living animal. It is backed up by leading research in the field. It presented the qualifier: According to the World Health Organisation (WHO), animals must only be studied when there is no alternative, and studying humans is impractical or unethical. Proponents of animal testing might argue that it has been essential for developing life-saving vaccines and treatments, provided for rebuttal. Nevertheless, the increasing effectiveness of alternative methods and the limitations of animal testing in predicting human outcomes need to be considered.
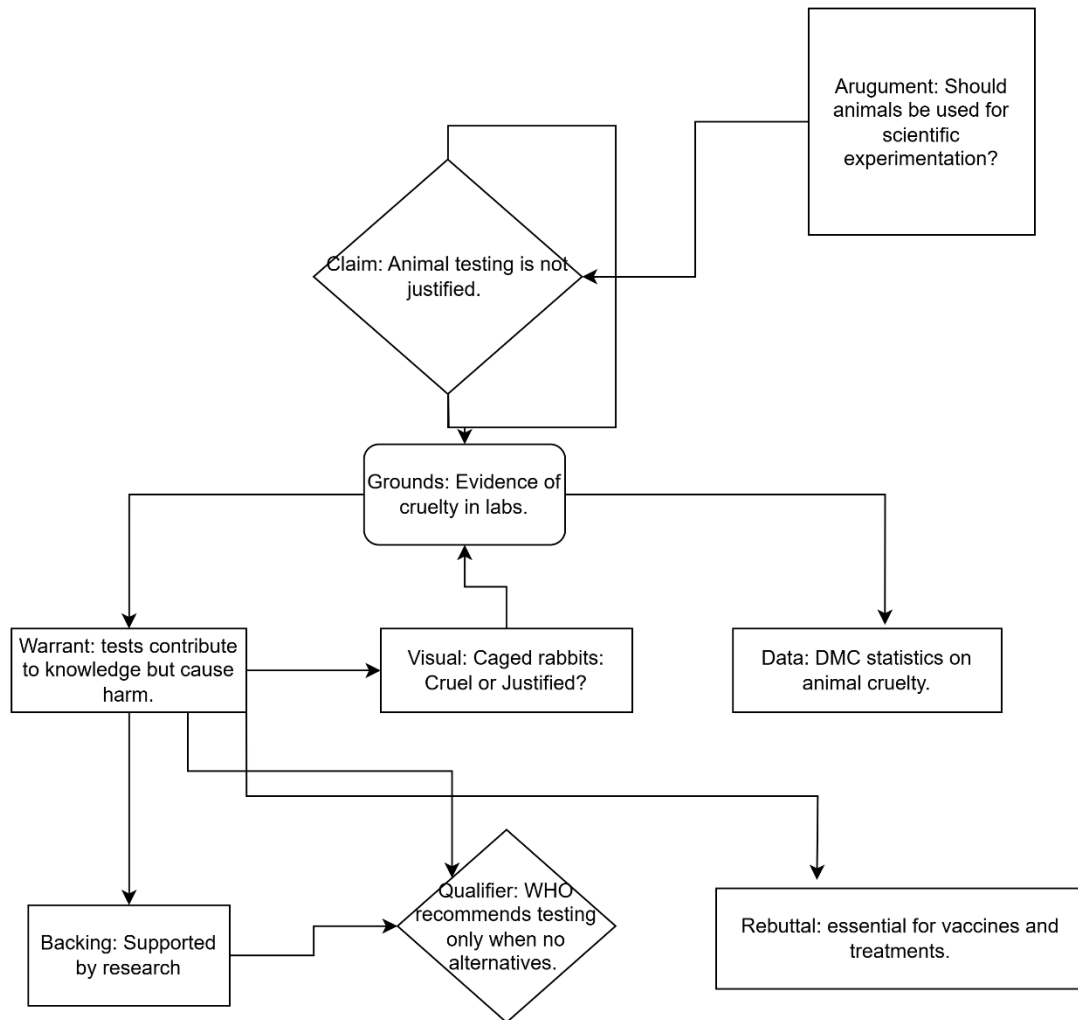
Figure 4.6: *Application of Toulmin's Model in the Blogpost*

The blogpost LLU argues that the government should increase public transportation services and grounds; it provided visuals of crowded buses, suggesting a high demand for public transportation, and an empty car, implying under-utilised space on the road. For warrant simplicity, indicating that if more people use public transportation, there will be less traffic congestion and a more efficient use of space. For backing, the blog mentioned specific research on the benefits of public transportation, such as reduced pollution and cost savings. For the qualifier, it mentioned that the needs and effectiveness of expanded public transportation will vary depending on the existing infrastructure, population density, and urban layout of

a specific city or region. For rebuttal, it argues that expanding public transportation is too expensive for weaker economic infrastructure and that people in Pakistan prefer travelling via private vehicle instead of public transportation.
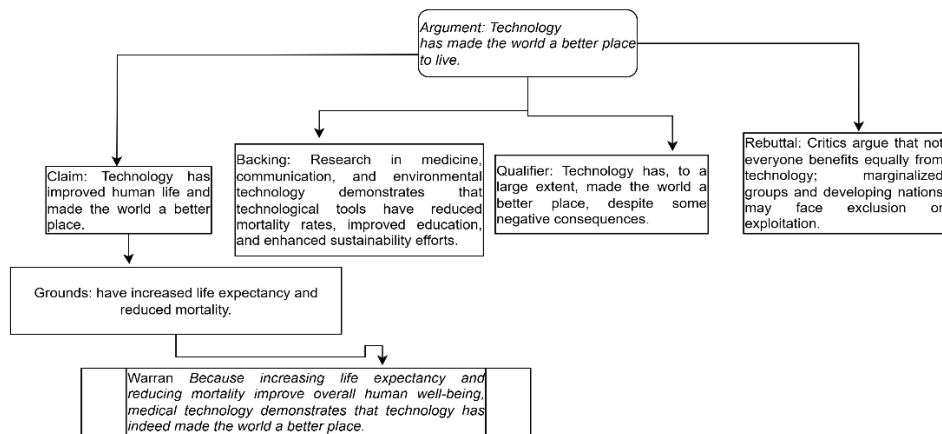
Figure 4.7: *Application of Toulmin's Model in a Blogpost*

LLB blogpost *'Education for All'* stated the claim title *'Should Higher Education Be Free for All'* posits a question that suggests a debatable position. For grounds, the text within the image distinctly includes arguments for and against free higher education, serving as grounds for considering both sides of the debate. For a warrant, the blogpost might not explicitly state the warrant, though it supports the reasoning behind connecting the grounds to the claim. Nevertheless, there could have been warrants in terms of 'Free higher education would increase social mobility and access to knowledge for all,' though not explicitly stated, but implied by the reader. Warrants against free education were presented that free higher education could lead to decreased quality or a burden on taxpayers, again, not explicitly stated but implied. The blog provided the backing in terms of a positive correlation between education and economic growth. It provided financing models that could be counted as qualifiers. In rebuttal, this blog argues that free higher education would be too expensive or decrease quality due to increased enrolment. Nevertheless, alternative

funding models explore and increase efficiency and focus on core programs that address quality concerns.

The following blogpost on technology claimed that technology has made the world the best place to live, made a clear claim, and provided grounds such as improved access to information through the internet. It transformed industries, made our lives more convenient and efficient, and has positively impacted healthcare. The warrant, the underlying assumption that justifies the connection between the grounds and the claim, has been explicitly stated in the blogpost. Nevertheless, it can be inferred that the warrant is that these improvements to communication, efficiency, and healthcare have made our lives better overall. The internet backs this claim, and online resources provide access to educational opportunities and information previously unavailable to many. Technologies such as water purification, irrigation, and efficient agriculture have improved access to clean water and food sources. The blogpost's qualifier that technology has made the world the absolute best place to live is subjective and depends on individual perspectives. The rebuttal states that technology has exacerbated social inequalities, created existential threats, or damaged the environment. Nevertheless, the positive impact on health, education, and living standards cannot be ignored. Technological advancements directly address these challenges and promote a more sustainable future.
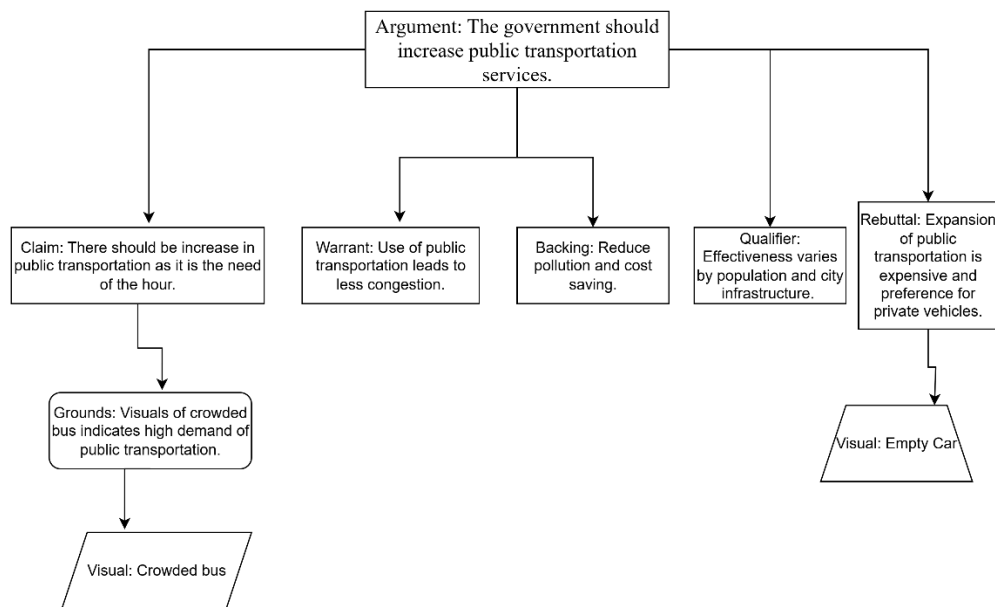
Figure 4.8: *Application of Toulmin's Model Realisation in a Blogpost*

Blogpost LLA argues that companies should be prohibited from advertising junk food and sugary drinks; there are several grounds to support this claim, such as the consumption of junk food has reached an alarming level and is connected to several health issues, including diabetes, heart disease, obesity, and tooth decay, targets vulnerable children and adolescents who are easily influenced by such advertising have been given in their argument. Warrants in this argument inferred that protecting children from unhealthy habits and promoting public health are pivotal goals that justify restricting junk food advertising, supported by research that has indicated a clear link between exposure to food advertising and increased consumption of unhealthy foods, especially in children. The qualifier in this blogpost refers to a complete ban on advertising might not be the only solution; instead, alternative approaches, such as restrictions on advertising during certain times, media platforms, or regulations requiring more transparent nutritional information labelling, could also be considered. Rebuttal has been laid out as opponents might argue that a

ban on advertising infringes on a company's freedom of speech and hinders consumers' choice. Nevertheless, public health concerns often outweigh these concerns, and alternative marketing strategies that do not target the audience can still be employed.

The following blog claims that smartphones make people less isolated and more socially connected. The data provided supports that smartphones allow for instant communication and connection with friends, family, and social circles through texting, social media, and video calls. It has been warranted that if smartphones provide easy access to communication tools and social platforms, then they have the potential to increase social connections. In terms of qualifiers, it states that the impact of smartphones on social connections depends on individual usage patterns and awareness. Mindful use prioritising real-world interaction and healthy online habits leverages the positive aspects of social connection offered by smartphones and provides a rebuttal that argues that smartphones provide new avenues for social connection, not replacing traditional methods. Contrarily, the potential for social media to be addictive and the ease of withdrawing into a virtual world warrant considering the potential downsides.

The following blogpost claims that drug abuse is a serious problem with negative consequences for individuals and society, has grounds that state drug abuse is increasing and is linked to several issues, including addiction, health problems, crime, and social instability, provided with evidence such as a graph showing an increase in drug overdose deaths between 2015 and 2020, a statement that drug abuse is a generational source, meaning that children of parents who abuse drugs are more distinctly possible to abuse drugs themselves, a statement that drug abuse affects the brain and leads to unusual behaviour, a quote from an article stating that teenagers

who use gateway drugs such as nicotine or marijuana are at a higher risk of developing severe drug addiction later in life, a statement that substance abuse negatively impacts a community's economy. The blogpost used the warrants to justify the linking between the evidence and the claim: Warrant 1: Correlation between drug use and negative consequences implies causation; Warrant 2: Experts agree that drug abuse is a genuine problem; Warrant 3: It is reasonable to assume that children of drug-abusing parents are more likely to abuse drugs themselves. For the backing component, it can be assumed that the author relied on the credibility of the sources cited, such as the KFC. The blogpost provided rebuttals, which are counterarguments to the claim by arguing that the potential benefits of medications need to be weighed against their risks, and regulations mitigate some of these concerns.

The rhetorical layer of the GeM model serves as an effective tool for analysing the structure of multimodal artefacts, where the layout structure adheres to a systematic pattern based on Toulmin's Model of Argumentation. In Writing New Media, Wysocki (2004) argues that *'compositions only ever work within and as part of other, already existing, structures and practices'* and that *'innovative technologies do not automatically erase, overthrow, or change old practices'* (2004). The blogpost analysis validates this argument since these blog entries' organisational structure is like that of a humanities essay. All these blogposts have thesis statements in their main paragraphs, identical to a written essay for any academic requirement, having text, references, and different sections and paragraphs. These blogposts for a fine-grained analysis to unearth multimodal granularities followed a framework for constructing their arguments, but in a way that offered certain gains and losses for academic writing (Kress, 2005).

Following Toulmin's Model of Arguments (1958), rhetorical strategies invite engagement with argument, clarity, and structure. This model helps construct effective rhetoric by providing a framework for persuasive, efficiently supported, and clear arguments. The rhetorical structure of arguments using this model investigates the argument flow, dividing arguments into six parts: backing, rebuttal, claim, warrant, grounds, warrant, and qualifier. The model provides a clear structure. This makes it easier for the writer to construct a logical and well-organised argument and for the audience to follow the reasoning. Secondly, it would weigh the strength of evidence (grounds) to support the claim and find relevant and credible data to support the argument, making it convincing. At the second level, it would look at the rhetorical aspects within this model that strengthen an argument by addressing counterarguments, including qualifiers and rebuttals, which address potential objections in claims and qualifiers and engage with diverse academic audiences.

Graphical Components in the Learners' Generated Blogposts – Understanding Image-Flow

The content and structure of the blogposts have been analysed by extending the focus to include images, illustrations, maps, and other graphic elements. This analysis seeks explicitly to identify which visual semiotic modes contribute to realising the academic blogpost genre. Emphasis will be placed on graphic elements, their interaction with text-flow, and ultimately, their combinations within the page-flow. Initially, it is essential to identify which graphic elements are present in the data. As established, the blogpost medium is inherently visual. Previous examples have featured images and illustrations in various forms and sizes; however, further examination of the learners' generated DMC data is necessary to observe their distribution.

This represents the initial step in examining the role of graphic elements within the multimodal structure. The graph appended below 4.7 shows the distribution of graphic elements in the learners' generated DMC data: a total of 166 graphic elements, having seventy-six images, twenty graphs, twenty-six infographics, thirteen pull quotes, twenty-three memes, five maps, and five hyperlinks, images covering most of the space in the dataset. The analysis demonstrates and discusses how these graphic elements function as parts of the blogposts' multimodal structure.

Graph 4.7: *Indicating graphical representation in the DMC Data*

Graphical Representation in DMC Data
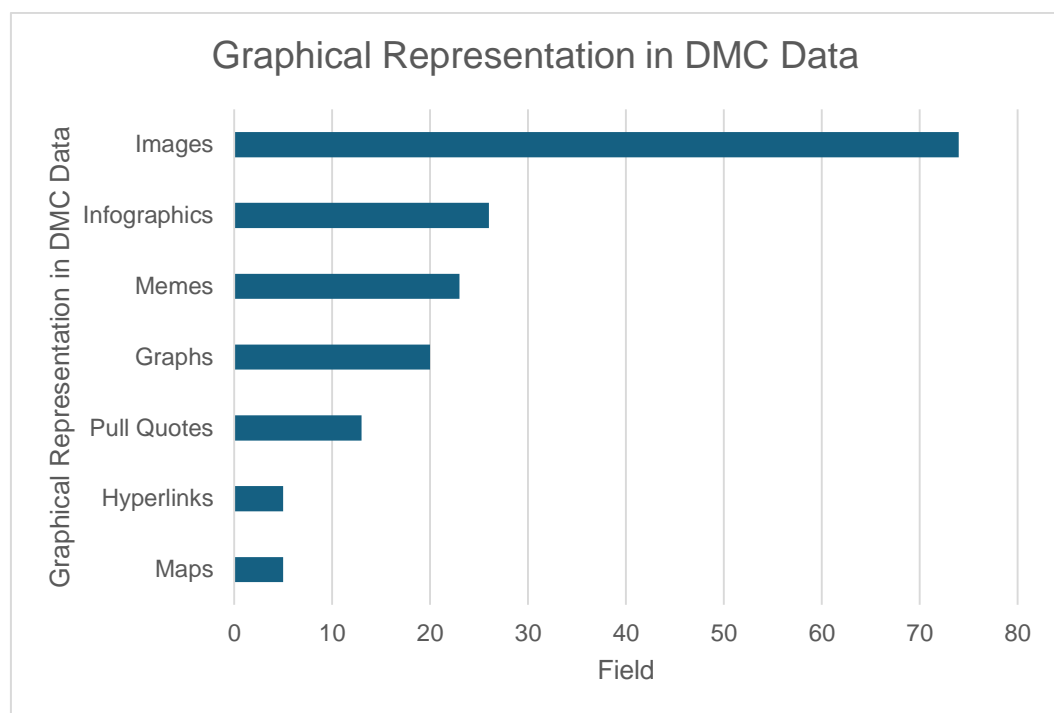
Graph 4.8: *Indicating Percentage of each Graphical Representation Through Pivot Charts*
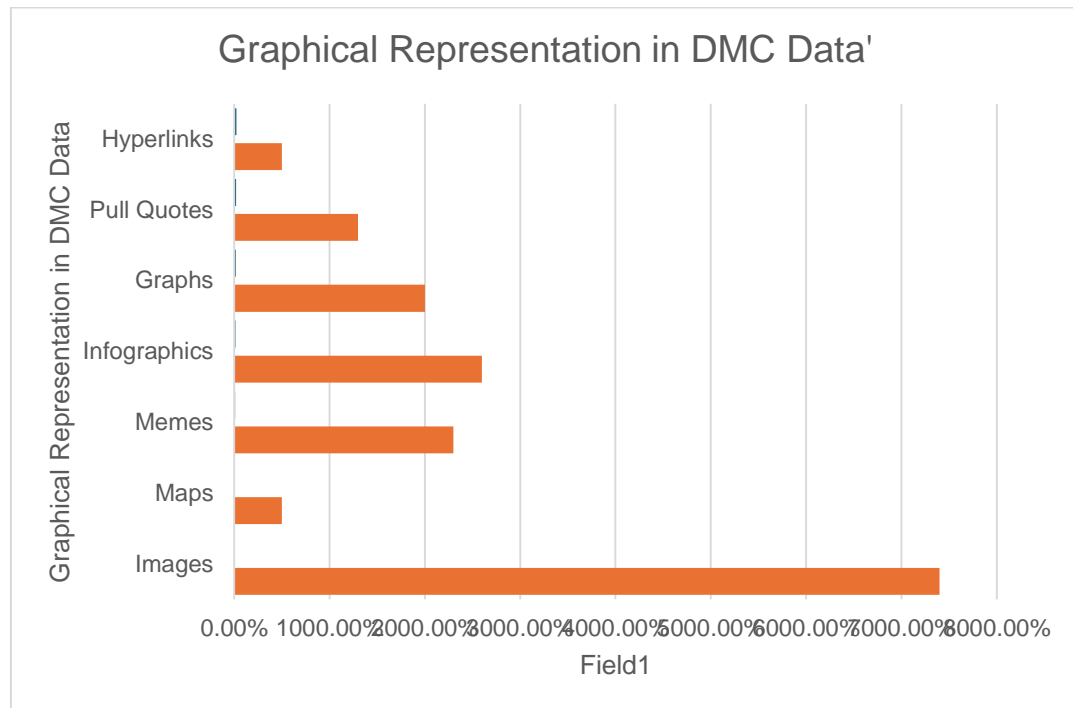
Graphs

Graphs are versatile tools for visually representing numerical data that enhance an academic blogpost's clarity, impact, and effectiveness (Kirk *et al*., 2016). Graphs in these blogposts reveal trends, such as increases, decreases, or stability over time, and establish a Comparison on the dataset, highlighting similarities and differences. These blogposts have frequently employed graphs, providing visual evidence to support claims and arguments while establishing the author's credibility. In these blogposts, following the stated model, the use of graphs supports backing and visualises evidence, making it easier to understand and interpret. Moreover, it has been noted that warrant reinforcement has been done using graphs, as illustrated in the Blogpost LLB below, which are the underlying principles that connect the data to the claim.

Figure 4.9: *Use of Graph in Blogpost LLB*

Maps

Maps are more interesting from the perspective of multimodal structure because they show how the maps contribute to the reader's navigation and use of the blogpost (Hiippala, 2012, 2015), found in two blogposts in the same series. In terms of structure, the maps participating in an implicit navigation structure resemble the configuration described above because these illustrations also occur close to a header. Maps **a**re powerful tools in academic blogposts, especially when dealing with geographical, historical, or spatial data. In the blogpost, only two learners used maps to build a geographical context that illustrates the geographical context of a study, highlighting specific locations and regions as indicated in the blogpost below LLH. It reveals spatial patterns, distributions, and correlations between variables and shows changes over time, such as migration patterns, territorial shifts, or ideas spread. If we contextualise, then maps break down complex data into visually digestible formats, and well-designed maps capture the reader's attention and make the content more engaging. In the blogpost, maps provide visual evidence to support the claim and establish a strong rationale for location-specific demand for establishing new provinces in the country. (Hiippala, 2007) In his doctoral dissertation, he suggested maps as an essential factor principal factor in guiding tourists while studying tourist brochures.

Figure 4.10: *Blogpost LLH Indicating Use of Maps*

Images

The text-flow was arranged around the images, suggesting a potential rhetorical

relationship between them. However, the images occupy separate layout nodes in the

hierarchy, as indicated by the bounding boxes, and are positioned in different areas

within the area model. It could be argued that the contrast between the subtle

signalling and the high impact of these conceptual images reflects their established

role within the academic blogpost genre. In essence, images in this context provide

background on the argument, location, or event without being deeply integrated into

the rhetorical structure of the blogpost. In contrast, when designers aim to emphasise

specific visual content, this can be achieved by incorporating images into the

multimodal structure as captioned images or illustrated descriptions. An image-text

complex forms a strong rhetorical link between an image and its accompanying text, allowing flexibility for various content types through cohesive ties between images and text-flow, a common semiotic feature across genres.

Pull Quotes

Blogposts use pull quotes to assemble, and how the texts are put together influences how valuable people think the argument is, and reinterpreting and conversing with the referenced sources dialogically (Spranzi, 2011). Blogpost LLL, at all events, uses lengthy passages of text as direct quotations to make the argument sound, for instance, a *'derivative'* or a copy of the original argument. Pull quotes significantly enhance the impact of effectively employing Toulmin's Model (1958) in these academic blogposts. It intrigues and piques the reader's interest and encourages them to read further by highlighting specific evidence or data supporting the claim and articulating the underlying assumption that connects the data to the claim.

Figure 4.11: *Blogpost Indicating Use of Pull Quotes in Blogpost LLM*

Meme

Integrating memes into academic blogposts is an intriguing trend that raises questions about their potential to enhance or undermine scholarly discourse (Carpenter, 2024). While memes are often associated with light-hearted humour and internet culture, the learners are strategically employed to develop their academic arguments, particularly within the framework of Toulmin's model. Memes potentially contribute to this model, providing grounds to visually represent a complex idea, making it more accessible and engaging to a broader audience while enhancing the persuasiveness of an argument. The learners carefully consider these factors and the academic audience while incorporating memes to harness the power to create engaging and impactful blogposts that effectively communicate their ideas in the ESL context, as indicated in the Blogpost below. An eminent feature of Healthy Eating is including a picture meme under the credits.

Figure 4.12: *Use of Meme in the Blogpost*

Figure 4.13: *Use of Meme in the Blogpost*

Infographics

Infographics have been employed in these blogposts. These infographics significantly enhance the impact of academic blogposts, particularly those presenting their academic arguments. By visually representing complex information, infographics present clearly stated arguments; also, it has been argued that using icons, symbols, or illustrations makes a claim more memorable and easier to understand. Through the logical flow of information in a well-structured infographic visually represents the logical flow of evidence, making it easier to follow the argument. Strengthening the warrant visually explains the underlying assumptions and principles that connect the evidence to the claim and helps persuade the reader to accept the warrant and the overall argument's validity.

Figure 4.14: *Use of Infographic in LLB Blogpost*

Semiotic Modes Employed in the Blogposts – Understanding Page-Flow

Information design has increasingly recognised the significance of page layout and its impact on communication. Waller (2012) contends that *'page layout is a little-discussed aspect of the text, but it connects closely to a range of fundamental issues concerning the nature of text, documents, writing, and reading.'* While he highlights how page design supports and influences the reading process, my analysis will consider the page through the lens of semiotic modes and their discourse semantic interpretations. Given a page's diverse forms, any artefact structure model explains its structure and function, what pages do, and how they do it. This analysis identified distinct configurations of text-flow, each contributing to various stages within the genre of an academic blogpost.

Additionally, the integration of graphic elements into the multimodal framework of these blogposts was also explored. However, the semiotic mode of page-flow, which merges text-flow with graphic elements, has not yet been fully addressed. Page-flow's defining characteristic is its ability to combine the *'output'* of participating semiotic modes across the two-dimensional space of a page, using

discourse semantics to signal relations between these modes (Bateman, 2009). The analysis will move from detailed multimodal structural analyses toward a broader view focused on the page to clarify how semiotic modes work together within page-flow.
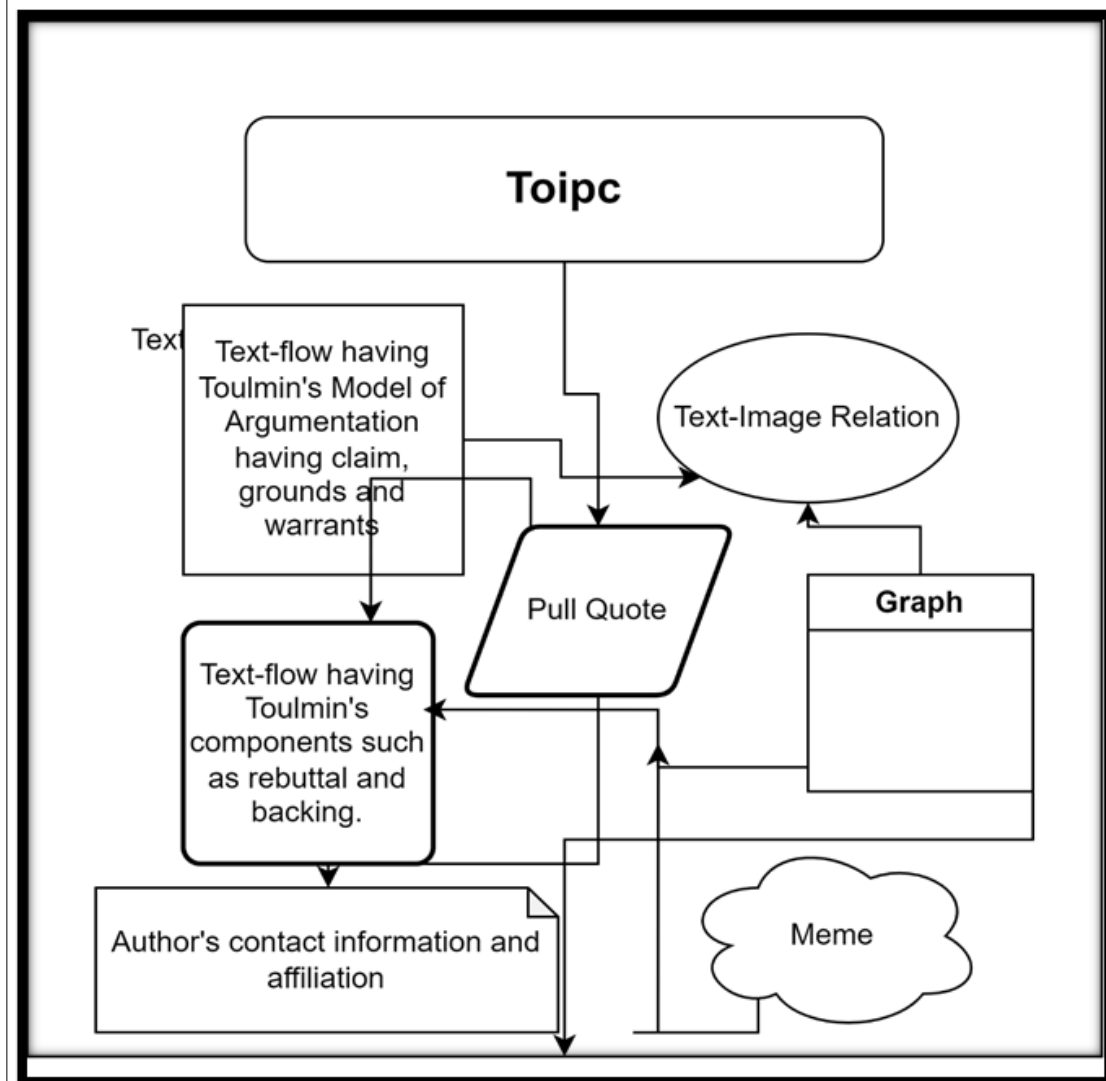
Figure 4.15: *Page-flow in the Blogpost*

Insights from document theory, particularly Bateman and Schmidt's (2012) observation that multimodal artefacts are *'articulated parts designed to be assembled in numerous ways by users'*, are helpful here. This analysis aims to determine what cues prompt a discourse semantic interpretation specific to page-flow rather than text-flow. According to Waller (2012), understanding which features of a multimodal

artefact encourage nonlinear reading strategies is essential. The analysis emphasises

cross-layer relationships between layout and rhetorical structures (Hiippala, 2013). It

has been anticipated that these layers will help readers recognise page-flow by

shaping the *'articulated parts'* of an artefact that readers reassemble during

interpretation (Bateman & Schmidt, 2013). The question at page-flow within the GeM

framework is whether a multimodal blogpost exemplifies page-flow and whether it is

text-flow with an image-text-complex in a unique configuration.

Instead of relying solely on the visual appearance of the spread, examining its

rhetorical and layout structures significantly enhances the identification of the active

semiotic mode. To correctly interpret the image-text relationships in Figure 4.16

below, the reader refers to the captions and associates them with the appropriate

images, requiring distinct interpretations. In the case of page 3, the captions and

images proceed from top to bottom, progressing from left to right.
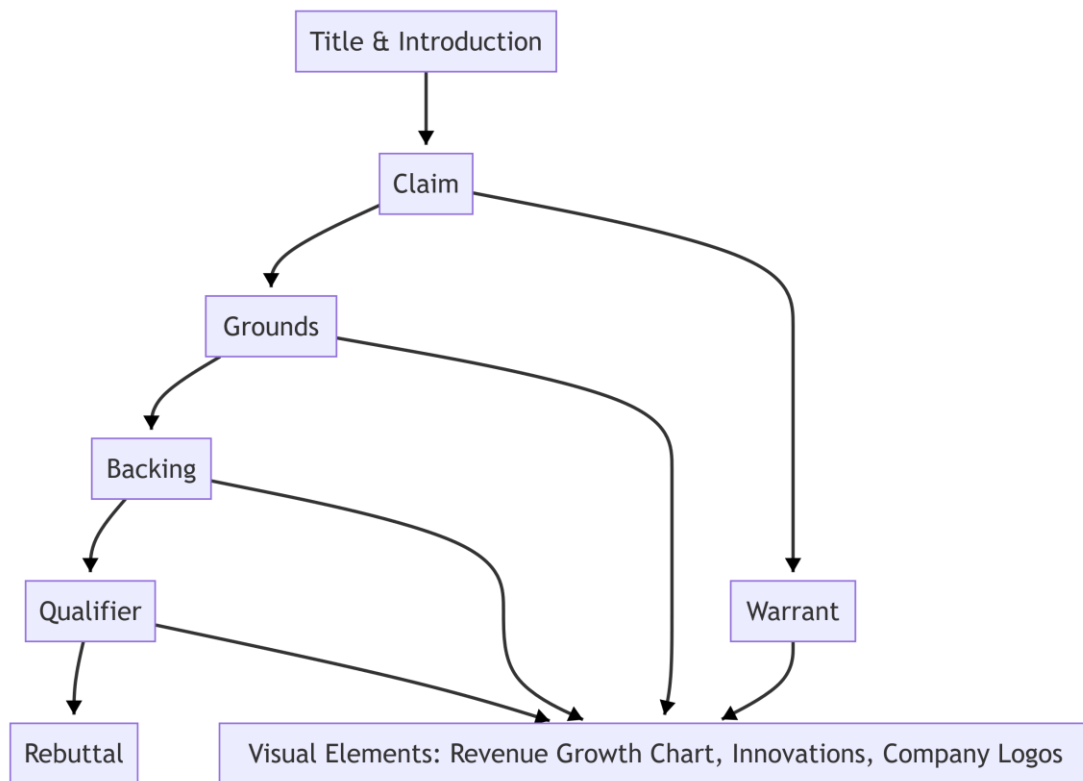
Figure 4.16: *LLF blogpost highlighting Rhetorical and Layout Structure*

In contrast, interpreting the correct relationship between captions and images requires understanding their organisation on the page, which, it is argued, supports identifying page-flow as the active semiotic mode. Crucially, the interface between rhetorical and layout structures appears central to grasping the underlying principles of page-flow (Hiippala, 2013). This interface will, therefore, serve as the foundation for the subsequent examination of page-flow. The initial step in deconstructing page-flow within the analysis involves examining the semiotic modes in use. As noted earlier, distinguishing between 'visually enriched' text-flow and page-flow can be challenging, as visual intensity alone does not suffice to determine that page-flow is the active mode. A deeper analysis of a multimodal artefact's structure is essential to clarify semiotic modes. Now, it is also helpful to recall the (Bateman, 2011) definition of page-flow: *'relies upon the complete two-dimensional space of the 'canvas'*

provided by the physical substrate and uses proximity, grouping of elements, framing, and other visual perceptual resources to construct connections, similarity, and difference patterns.'

It is essential to distinguish between the process of visual perception (Kappas & Olk, 2008) and the role of visual perceptual resources on a page, which are interconnected yet distinct issues (Höllerer *et al.*, 2019). It focuses primarily on how visual perceptual resources contribute to organising the content. With detailed descriptions of both content and its multimodal structure, the study is well-positioned to examine how these elements combine on a page and achieve specific communicative goals.

The subsequent question, then, is: does the organisation of content affect how the page is interpreted? The discourse semantic component directs the interpretation of semiotic resources within a semiotic mode. Interpreting semiotic resources is crucial in page interpretation; Bateman (2011) demonstrates that understanding a single page may require multiple discourse semantic interpretations. An entire page's interpretation processes are vital for modelling a multimodal artefact. It directs analytical focus toward the interface between layout and rhetorical structures. Interpreting *'visual perceptual resources,'* the landing page layout aligns with several page-flow characteristics identified in the previous section (Bateman, 2021). The content is structured into content blocks, each fulfilling stages typical of an academic blogpost genre, in context and discourse. These descriptions follow a consistent structural pattern, like what Waller *et al*. (2012) describe as a *'pattern language.'* Simply put, patterns serve communicative needs by providing specific means of expression. These patterns form the *'building blocks'* of a genre, a concept that Stöckl (2024) expands upon in his research on modal interrelations.

Figure 4.17: *Content side in Blogpost LLF*

The identified structures exemplify patterns essential for realising the academic blogpost genre. The GeM model and semiotic modes enabled the identification of these patterns. In Figure 4.18 below, it has been argued that page-flow is the active semiotic mode, though understanding page-flow requires a more focused analysis of the landing page's multimodal structure, particularly its layout structure. Notably, two image-text complexes are visible in the layout structure, marked with a grey background in Figure 4.17 above, while white boxes indicate text-flow content blocks for examining the rhetorical structure of *'image-text-complex.'* Arguably, spatial proximity within an image-text complex signals their intended interpretive relationship.
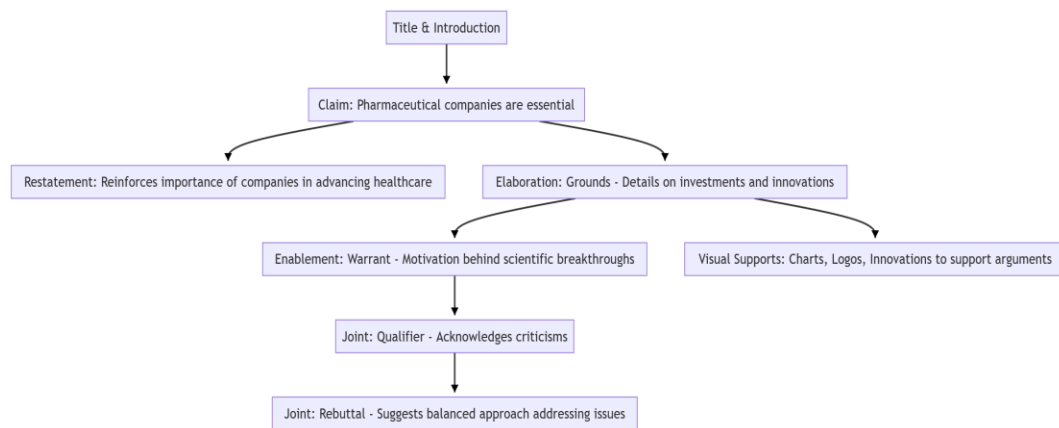
Figure 4.18: *Indicating the layout structure and a part of the RST structure in Blogpost LLF*

Understanding page-flow hinges on recognising how layout structure signals that content should be interpreted separately, chunk by chunk. If multimodal artefacts indeed consist of articulated parts that users piece together during interpretation (Bateman & Schmidt, 2013), organising content into distinct layout chunks strongly encourages a selective reading strategy (Waller, 2012), supporting the discourse semantic interpretation associated with page-flow. Alternatively, encountering a

different layout structure while still aligned with the academic blogpost genre might lead to a different interpretation. For instance, the cover side of the same blogpost is primarily visual, with 50% of the layout occupied by graphic elements. Figure 4.17 shows the layout structure of the entire cover side, which it proposes aligns with the semiotic mode of text-flow. The conclusion rests on several observations: unlike the fragmented page-flow structure, the layout in Figure 4.18 above is simple, with only three layout chunks across the page.

While layout structure may help identify the semiotic mode, it is essential to note that it is not arbitrary; it is functionally motivated and must be combined with rhetorical structure for a comprehensive analysis. This combination reveals how a page's various 'articulated parts' cohere through layout structure (Bateman & Schmidt, 2013), establishing a basis for the next section, which delves into layout structures in learner-generated DMC data. It is essential to discuss how the page-flow semiotic mode functions at the layout-rhetorical structure intersection and how this dynamic can be captured through the GeM model. The visualised layout structure shows the parent node representing the double page, with individual page nodes below. Though they display some structural similarities, they are not symmetrical. Perfect symmetry would imply identical structures, which is unlikely given multimodal semiosis's variability on more granular levels. However, ideal symmetry may serve distinct purposes in specific contexts, such as conveying equivalent meanings in bilingual content.

The repetition of this pattern across the blogposts aligns with the *'pattern language'* view of document design (Waller *et al*., 2012), aptly describing multimodal meaning on a page. The analyses pave the way for establishing patterns relevant to blogposts. Whether these semiotic mode configurations are defined as articulated

parts (Bateman and Schmidt 2012) or design patterns (Waller *et al*. 2012) is secondary; the focus should be on how semiotic modes enable the interpretation of semiotic resources individually and collectively. Two key concepts inform this task. First, genre as an *'expectation-generating device'* sets expectations for content and communicative goals, which are then expressed through anticipated *'forms of expression'* (Bateman, 2009). In academic blogposts, these expressions align closely with genre expectations. Second, these expressions are described as a pattern language, transcending the academic blogpost genre. Forms like the image-text complex appear across media and genres (Caple, 2009; Knox, 2007). This means that content and structure expectations and patterned responses facilitate interpreting semiotic modes, enabling readers to navigate complex layouts like that in Figure 4.18, appended above. The GeM model's layout and rhetorical layers capture the multimodal structures that shape expectations for content, structure, and interpretation. Successful interpretation relies on selecting the correct semiotic mode, which is central to *'document literacy'* (Waller, 2012). Document recognition studies suggest that humans classify multimodal artefacts uniformly, indicating that document literacy is responsive to various artefact types (Cohen & Snowden, 2008).

Formalising the Discourse Semantics

Having already examined the semiotic modes through the lens of both layout and rhetorical structures, one of the critical aspects of these semiotic modes encompasses their discourse semantic interpretation following the GeM framework. It has been argued that these structures guide the reader's understanding of the page and its elements, thereby directly contributing to the discourse semantics of the active semiotic mode. According to Bateman (2011), interpreting a multimodal artefact successfully requires selecting and applying the discourse semantics of the

appropriate semiotic mode. By doing so, the reader is able to access the intended content. This research, for example, demonstrates the interpretive process: since it uses text-flow to convey its meanings, readers are unlikely to interpret the page using the discourse semantics of page-flow, as there is no indication that additional meanings could emerge from the layout space. Thus, the correct interpretation here is achieved through the discourse semantics relevant to linguistic discourse in an academic dissertation genre.

In other contexts, the discourse semantics of page-flow are more applicable. My argument is based on multiple semiotic modes on the page, which simultaneously introduce various discourse semantic interpretations. The reader's task is to determine appropriate interpretations for each semiotic mode. Moreover, Bateman (2011) suggests that these discourse semantic interpretations may sometimes compete on the page. However, before assessing whether such interpretations compete, it is necessary to delineate the discourse semantics for each semiotic mode present on the page. Text-flow operates on a linear structure characteristic of this semiotic mode. Text-flow is used to achieve several stages of the academic blogpost genre. The analysis demonstrated how the GeM model's rhetorical layer captures the discourse structure of text-flow and organises different genre stages, such as argument structure.

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Layout Space   **Text-flow**

z

e

Order

e'

z(e)

z(e')

text Structuring

z

Text- flow (after Bateman 2011)

Layout Space   **Rhetorical Structural Relation (RST)**

z

e

Composition

e'

z(e)

z(e')

RST

z

Page-flow (Bateman 2011)
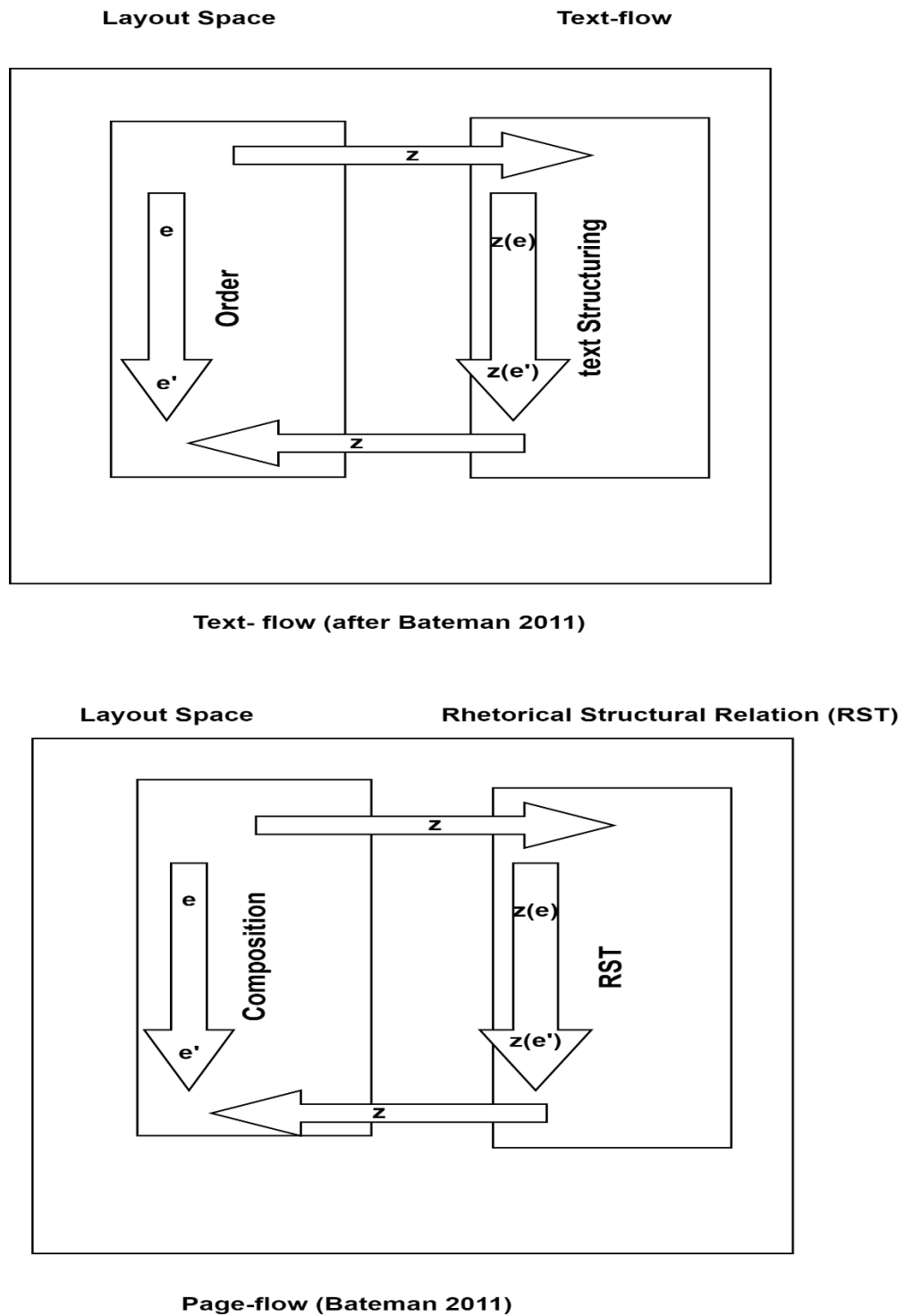
Figure 4.19: *Back-and-forth mappings of discourse semantics*

The principle of linearity is intrinsic to text-flow interpretation. This is
illustrated in Figure 4.19 above, which shows the discourse semantic interpretation of
text-flow through a back-and-forth mapping (Bateman, 2021). In text-flow, the

evolving discourse follows order and text structure across various language strata. Although linearity guides rhetorical structures, these structures provide a specific representation of the discourse structure of text-flow, particularly for the academic blogpost genre. Bateman (2011) expands on the general principle behind page-flow; we observe compositional relationships where spatial layout is integrated with the principles of rhetorical structure theory; in essence, hierarchical composition aligns with hierarchical rhetorical organisation.

In GeM terms, hierarchical composition corresponds to a blogposts' layout structure and area model. Rhetorical relations emerge between different segments within this hierarchical layout, often distributed across the page's distinct areas. This exemplifies the concept of page-flow in action. By examining the interaction between layout and rhetorical structure, we can explore how the GeM model captures the specific dynamics of page-flow in blogposts.

A key question arises: What initiates the discourse-semantic interpretation of page-flow, mainly when the layout is characterised by a few segments and a shallow structure? Due to this simplicity, interpreting the page demands less cognitive effort than more complex layouts, such as those presented in Figure 4.19. The latter's complexity stems from using a webpage with a higher number of layout segments, multiple content blocks, and a deeper, more fragmented structure. These observations suggest that the layout structure significantly influences an interpretation based on the discourse semantics of page-flow. Multiple layout segments prompt the reader to examine potential rhetorical relations among them. This identification and interpretation of layout segments are supported by specific forms of expression in the blogposts. These forms, identified in the learner-generated DMC data, combine information from the layout and rhetorical layers of the GeM model.

With the core principles of page-flow established, the next step involves a more detailed exploration of how this semiotic mode functions in learner-generated academic blogposts. Earlier analyses using layout and rhetorical layers were further refined through back-and-forth mappings that capture the discourse-semantic interpretation of semiotic modes. For example, consider the image-text complexes referenced in Figure 4.19. I previously argued that the meaning potential of these complexes arises from the spatial proximity between the image and its accompanying caption. The discourse-semantic interpretation that guides our understanding of the image-text complex is achieved through such back-and-forth mappings, as demonstrated in Figure 4.19.

In the case of these image-text complexes, the spatial relationship between elements within the layout space is precisely defined: their proximity signals a rhetorical relation. However, this interpretation remains constrained compared to the more abstract notions of text-flow and page-flow outlined in Figure 4.19, as it pertains only to the image-text complexes. It is also important to clarify that the image-text complex is not an independent semiotic mode but a multimodal structure, a recognised form of expression that appears within both text-flow and page-flow (Bateman, 2009). In this context, back-and-forth mappings enhance the explanatory power of the GeM model, particularly for understanding intricate multimodal arrangements.

Additionally, it is crucial to recognise that semiotic modes are conceptual tools for analysing meaning-making in multimodal artefacts. Bateman's (2011) discourse-semantic definitions provide a theoretical foundation for understanding how semiotic modes operate, although further investigation is required to see how these modes are configured across different contexts, including other multimodal artefacts. For

example, research on film discourse, a dynamic form of image-flow, illustrates this potential. Studies by Bateman (2007), Bateman and Schmidt (2012), and Tseng and Bateman (2010, 2011) show how syntagmatic and paradigmatic choices within the semiotic mode of a film are systematically mapped, shedding light on how these choices shape discourse structure and meaning across various filmic artefacts.

Having outlined the vital semiotic modes involved in academic blogposts and their structural configurations, we understand how these modes work together to form a cohesive multimodal artefact. These configurations are viewed as recognisable patterns or expressive forms reflecting the genre conventions of the academic blogpost. They contribute to meaning-making and coherence, ensuring the blogpost functions effectively as an academic and multimodal artefact.

Detecting Semiotic Modes in the Blogposts

The analysis of Figure 4.9 reveals that using image-text complexes significantly enhances the effectiveness and engagement of learners' blogposts. The grey and blue bars in Figure 4.9 (A) represent the percentage of layout space occupied by graphic elements. The right vertical axis indicates the percentage of this layout space, while the left vertical axis shows the number of items: image-text complexes and text-flow paragraphs.

Graph 4.9 (A): *Pareto Charts Indicating Percentage of Layout Area Occupied by Graphics*
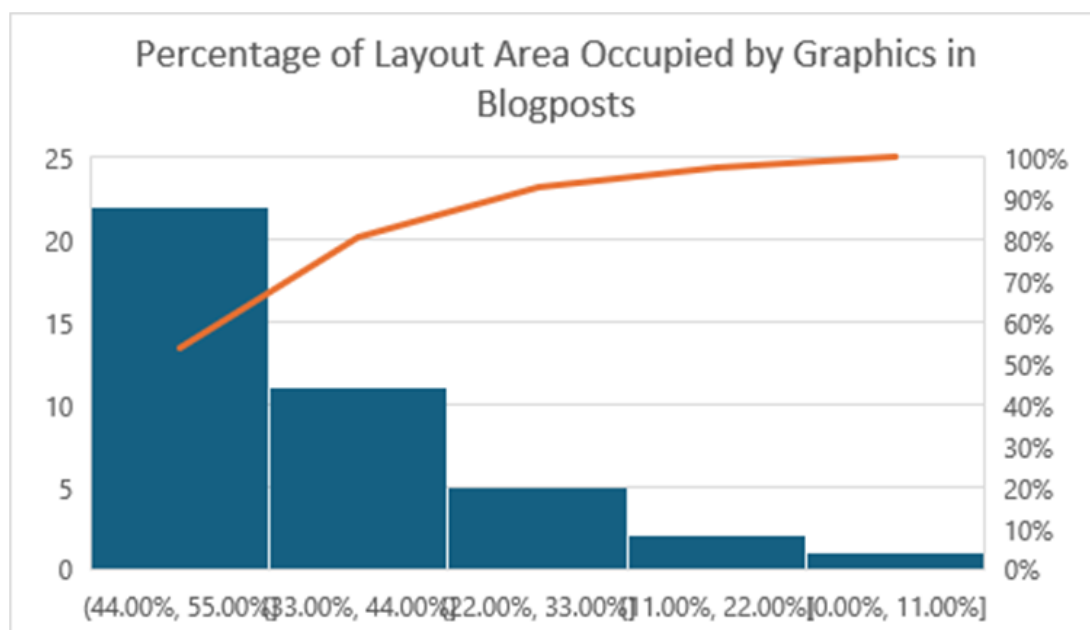
Graph 4.9 (B): *Pareto Charts Indicating Distribution of Semiotic Modes in the Blogposts*
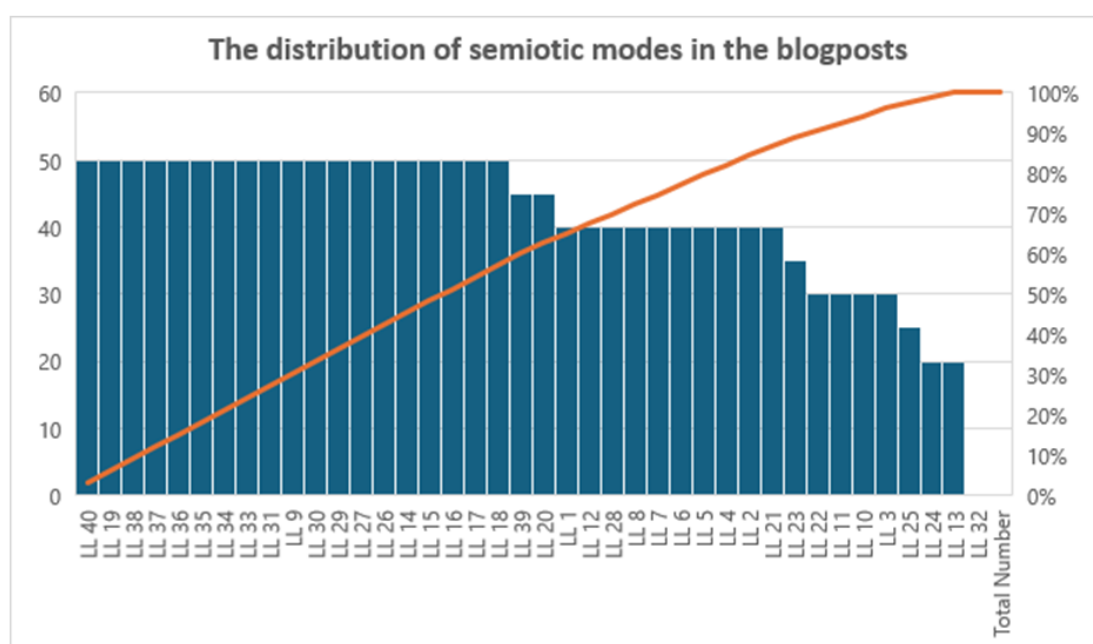
Through a systematic examination of learners' DMC data, seventy-one image-text complexes were identified, consisting of images accompanied by verbal descriptions. The combination of visual and verbal elements creates specific visual

representations that enrich the content of the blogposts. Integrating these image-text complexes supports a more coherent layout structure, fostering meaningful relationships between the visual content and the accompanying text. This relationship encourages readers to engage in a discourse semantic interpretation, enhancing their overall understanding of the material presented. The methodology for identifying image-text complexes involved establishing criteria that required a layout chunk to contain at least two content blocks: one image layout unit and one verbal layout unit. The diversity observed, such as captioned images and illustrated descriptions, highlights how learners incorporate visual elements into their writing. Additionally, pages featuring image-text complexes contained multiple examples in fourteen out of twenty instances, suggesting that a fragmented layout facilitates better discourse semantic interpretation.

However, it is essential to note that not all pages in the data set feature image-text complexes. Some pages lack these elements, often representing a single annotated blogpost, indicating variability in the application of visual elements among learners. Furthermore, certain pages lack text-flow because they are table-driven or serve as cover pages with limited visual content. Moreover, multiple image-text complexes on a single page sometimes led to a fragmented layout, potentially confusing readers. Therefore, the criteria for identifying text-flow ensure that only substantial text content is included, filtering out shorter fragments that do not contribute meaningfully to the narrative.

In conclusion, the learners' DMC data findings indicate that image-text complexes play a vital role in enhancing the semiotic richness of their blogposts. These complexes demonstrate their effectiveness in creating coherent and engaging narratives by analysing layout structures and adhering to specific identification

criteria. The strategic use of layout space and text-flow integration exemplifies how learners may leverage various semiotic modes to convey meaning and enhance reader engagement in an academic writing context.

Language and Image Interaction in DMC and Meaning-Making

Language serves as the primary semiotic tool to introduce the blogpost topic concisely. It enables learners to address socio-economic issues effectively by helping them articulate claims and advocate for these causes succinctly. Declarative clauses and nominal groups often deliver factual, neutral information. In contrast, imperative clauses prompt specific actions (commands) and encourage positive practices, such as arguing and advocating for social challenges, such as stopping excessive use of technology and pursuing healthier lifestyles by avoiding junk food. Nominal groups and imperative clauses provide additional details and resources (e.g., calls to action and invitations for global initiatives), which support and motivate viewers to respond or gain further insight into the following topics:

Table 4.6: *Blogpost Topics Motivated for Further Response*

Government should increase their public transportation services.
Consumers should be forced to buy electric-powered vehicles.
Not everyone will succeed in life on their first try.
Homeschooling is better than sending children to school.
Calculus yields better problem-solving skills.
Technology has made the world a better place to live.
Middle and - high-class people should pay 30% of their income to make the country better.

In academic settings, language and images contribute to meaning-making in diverse ways. Images tend to be more visually compelling to the general audience than text alone. They heighten blogpost visibility and convey meaningful messages, often encapsulating complex ideas more vividly than words. Illustrations break down sequences and clarify difficult-to-see scenarios, while images briefly capture key

ideas or components; whereas language is crucial for delivering clear, precise, and socially relevant messages, images possess unique strengths for meaning-making. Semiotic resources (e.g., language, images, layout) work in unison to fulfil communicative purposes within these academic blogposts. Verbal and visual semiotics blend to build and solidify ideas (e.g., knowledge and life skills), reshape perspectives (e.g., beliefs and values), and foster greater awareness and a sense of responsibility.

Images are frequently used to reiterate key messages initially introduced by language. Visuals illustrate or paraphrase a nearby line of text or passage, with the text or passage functioning as a caption that directly interprets the visual message. The proximity between the image and the text created a strong association between the two. The handshake between humans and the robot could symbolise a harmonious relationship between humans and technology. In the LLA blogpost, the image used contrast to highlight the two main messages of the blogpost. The left-hand side of the image was dominated by text and images that promoted healthy eating. The right-hand side of the image was dominated by text and images that promoted sugary drinks and unhealthy foods. The proximity of the text and images on each side of the image created a sense of comparison and contrast. The text and images were also arranged to emphasise the blogpost's message. The text at the top of the image is the largest and most prominent, and it clearly states the blogpost's call to action: '*Boycott sugary drinks and unhealthy foods*.' (LLA)

This blogpost data has been analysed by the network of image-text relations proposed by Martinec and Salway (2005), which gives a structured overview of different Logico-Semantic Relations (LSR) and their status in understanding text-image relationships within blogposts. LSR has been further divided into Elaboration,

Exposition, and Exemplification. Exposition, where the image and text share the same level of generality, may provide mutual reinforcement. In contrast, Exemplification, which has variations of 'image more general' and 'text more general,' suggests that images or text may serve as either a broad context or a specific example. Secondly, Extension, as a second major category, indicates an additive relationship where the text and image bring additional, related content rather than duplicative information. Enhancement with subcategories like 'temporal,' 'spatial,' and 'causal,' this relationship specifies how images and text may frame each other in time, space, or purpose. The last category of this relationship includes 'locution' (the specific wording) and 'idea' (meaning), focusing on how images and text convey statements or interpretations, especially where an image may prompt a particular reading of the text or vice versa; however, this category does not come under the scope of this study's analysis and hence will not be discussed here. In 'status,' equal refers to the independent image and text stand-alone, suggesting each could be understood separately, whereas complementary image and text enrich each other's meanings without complete dependency, creating a balanced relationship. The second category in status is 'unequal,' in which the image subordinates to text or text subordinates to the image.

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Equal — image and text indepent
image and text complementary

Status ⟶

Unequal — image subordinates to text
text subordinate to image

Elaboration

Expansion — Extension

Enhancement

**Logico-semantic
relations** ⟶

Projection
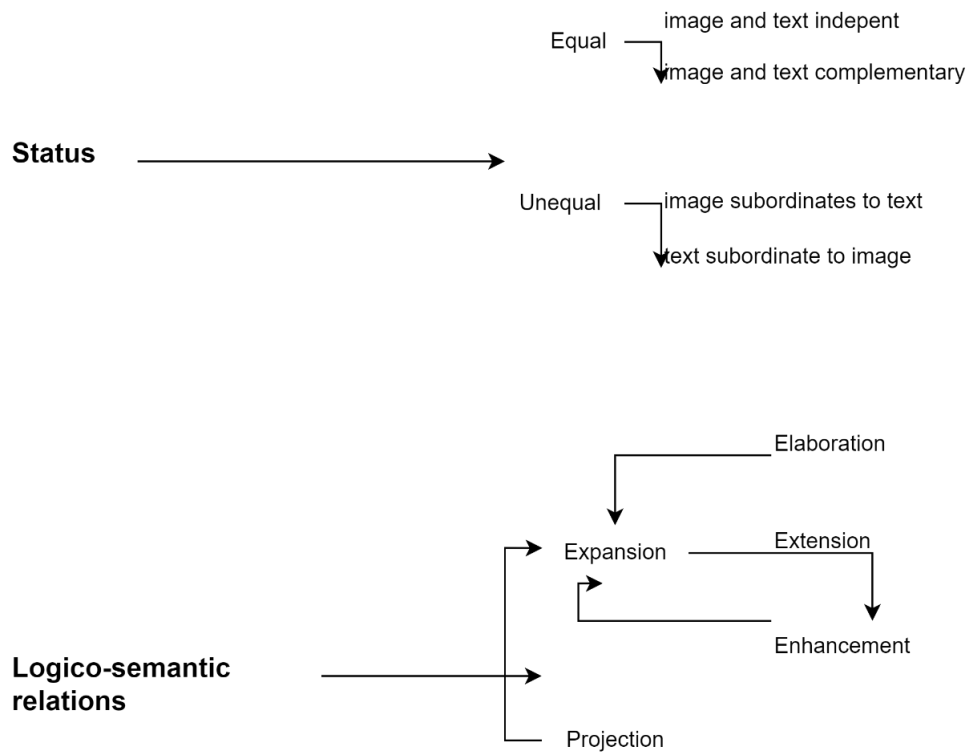
Figure 4.20: *The network of image-text relations proposed by Martinec and Salway (2005)*

Thus, verbal and visual elements serve as core components, reinforcing the same message. Secondly, images may further develop and exemplify the content conveyed by language. This combination of restatement and elaboration enhances clarity and simplicity in meaning-making, effectively linking verbal and visual segments.

Table 4.7: *Indicating LSR in Text-Images in Data*

	Logico-semantic relations	Text-Image Relations in Blogposts	
1	Elaboration		26
	Exposition	Image and text same generality	13
	Exemplification	Image more general	8
		Text more general	5
2	Extension		12
3	Enhancement		36
	Temporal		4
	Spatial		6
	Causal (Reason/Purpose)		26

Graph 4.10: *3D Surface Chart Indicating LSR in Text-Images in Data*
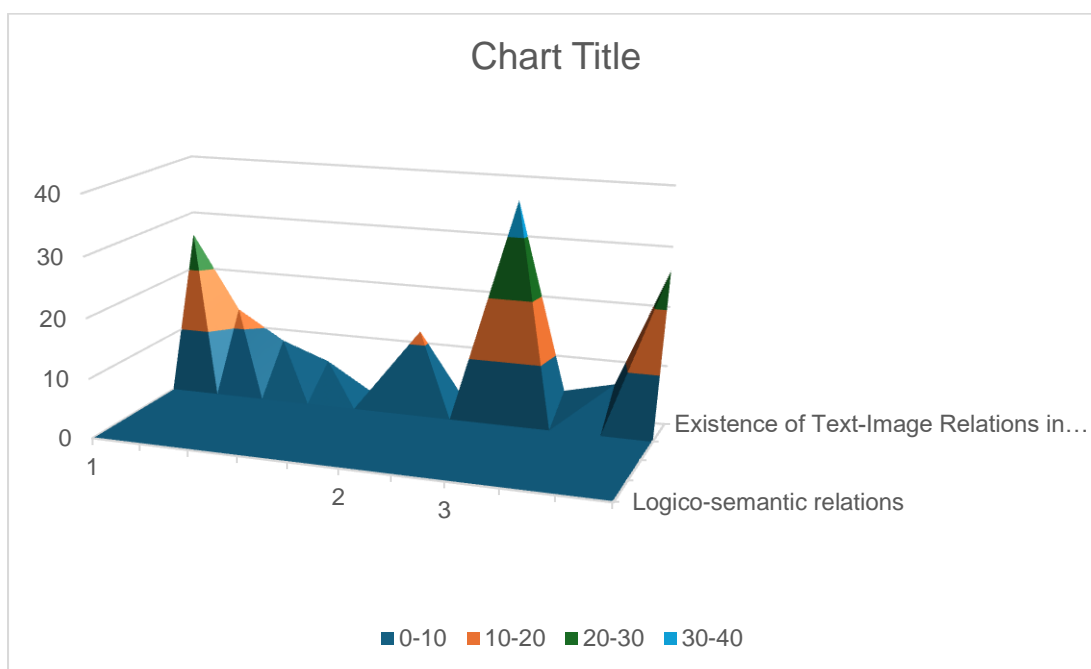
Graph 4.11: *Line Bar Chart Indicating LSR in Text-Images in Data*
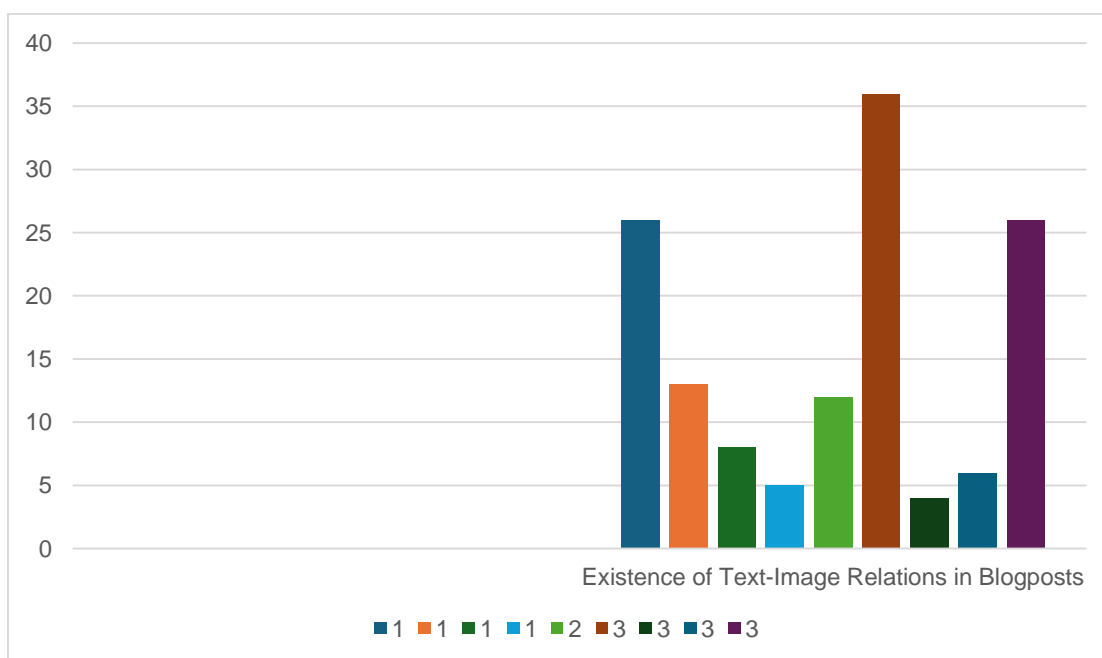
Graph 4.12: *Stack bar Chart Indicating Equal and Unequal Relations in Text-Images in Data*

Image and text complementary has noticeably higher 'No. of occurances these relations in Learners's Generated Blogposts'.

(Horizontal bar chart — Field2 on y-axis, "No. of occurances these relations in the Blogposts" on x-axis from 0 to 45)

- ii. image and text complementary: ~41
- ii. text subordinate to image: ~12
- i. image and text independent: ~11
- i. image subordinates to text: ~10
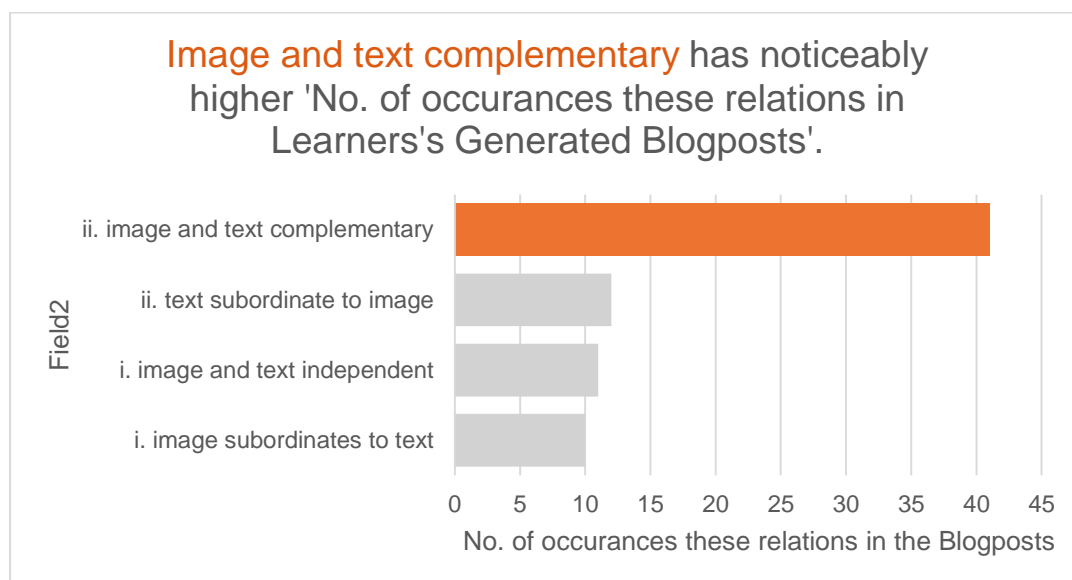
Table 4.8: *Status Relation in Text-Image in Data*

Sr. No.	Status	Field	Number of occurrences of these relations in the Blogposts
1	Equal	i. Image and text independent	11
		ii. Image and text complementary	41
2	Unequal	i. Image subordinate to text	10
		ii. Text subordinate to image	12

Graph 4.13: *Treemap Chart Indicating Equal and Unequal Relations in Text-Images in Data*
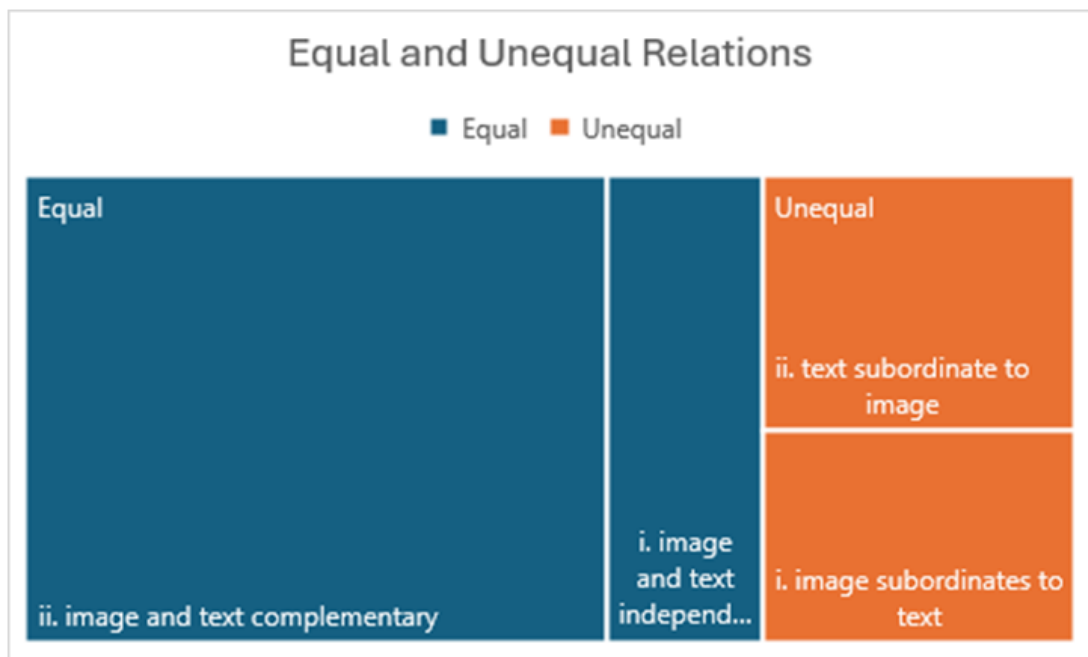
Graph 4.14: *Sunburst Chart Indicating Equal and Unequal Relations in Text-Images in Data*
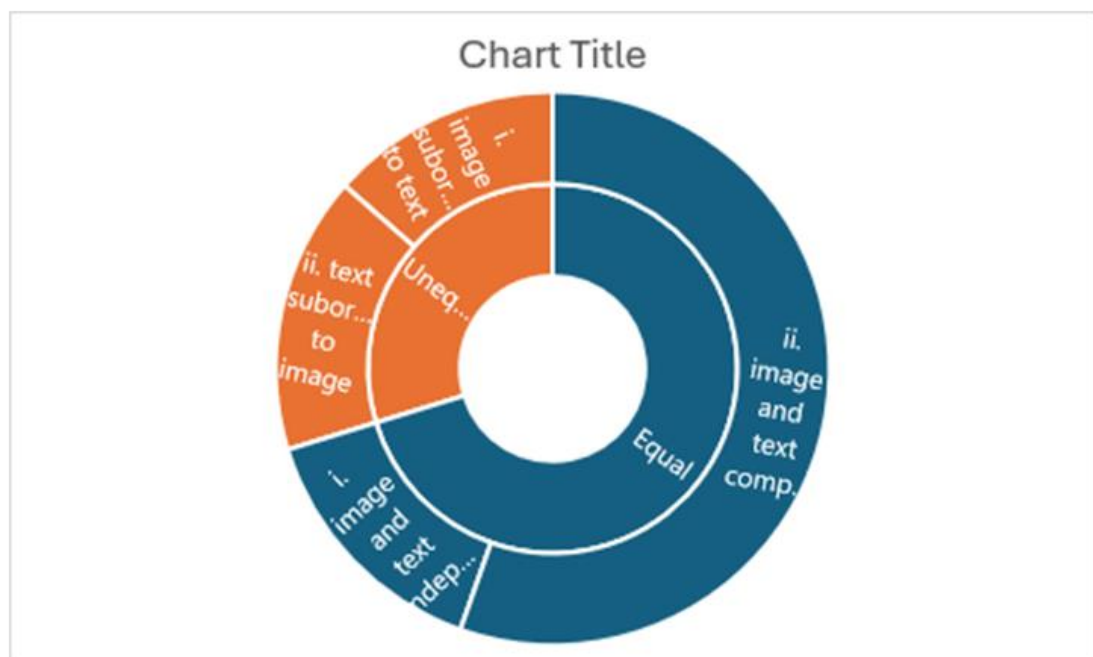
In the blogpost data, the dominant pattern in text-image relationships in status is that of image-text complementary relationships with 41 instances, suggesting a trend where image and text often support each other. In contrast, unequal relationships are sporadic in the dataset. On the other hand, in LSR, the most frequent is enhancement with a 'causal' subtype relation, showing a trend where image and text have been employed to explain the cause in blogposts. Elaboration has a higher frequency than Extension, and within Elaboration, Exposition, where image and text have the same generality, is quite common in the dataset, as shown in the Figures appended above.

In the LLD blogpost, text elements, for instance, headings and subheadings, are distinctly possibly left-aligned for an organised reading experience, whereas, in the layout, this blogpost followed a clear layout with a headline, subheadings, explanatory text, and an image section, which promotes a structured reading flow. In the LLU blogpost, for alignment, all text elements, for instance, headings and subheadings, are left-aligned for an organised reading experience, whereas in layout, a clear and organised layout is followed with a headline, subheadings, explanatory text, and an image section. This structure creates a logical flow of information. The placement of the image directly below the question about animal testing creates a strong connection between the visual and textual elements. In the organisation, the blogpost mentioned a question prompting further action, which suggested the blogpost is designed to inform and lead readers towards further exploration. Next, it is essential to discuss how this text and image have integrated and interacted with each other in the dataset through a fine-grained analysis of learners' generated blogposts, highlighting granularities in the dataset.

In LLF, the text could be left-aligned for an organised reading experience, whereas the layout organised the blogpost with a clear structure, including a title, introduction, body sections with headings, and a conclusion. It considered and approached the flow of information in an organised way, the way traditional essays do. In LLZ, the text and image are aligned in a way that is easy to follow. The text is located above the image and refers to the image, whereas in another blog, LLL, the image and text are well-integrated. The text overlayed the image in a visually alluring way and did not obscure the image. The layout of the page was simple yet uncluttered. The text was aligned to the left, and there was plenty of white space between the text and the image. This made the page easy to read and navigate. The overall design of the page effectively communicated the text's message. The visuals, text, and layout all worked together to create cohesive and engaging content, an argumentative piece of writing. The blogpost LLH used a clear and consistent layout. The text was divided into sections with headings, and the graphics were all aligned throughout the blogpost. This made the blogpost easy to read and navigate. The text, images, and graphics all worked together to support the central message of the blogpost: that technology has made the world a better place to live. The blogpost used text, images, and colour in LLA to create a persuasive message. The layout of the blogpost was clear and easy to navigate. The text was efficiently written and easy to understand.

The images were relevant to the blogpost's message and used effectively to create contrast and emphasis. In LLD, the layout was divided into sections with a clear headline, subheadings, and an image section based on the mention of 'The Picture News.' This separation suggested an efficiently organised and easy-to-read format. LLU divided the layout into clear sections with a blue masthead, headline,

subheadings, explanatory text, an image section ('The Picture News'), and a call to action. This structure promoted easy navigation and information retrieval.

This blog used three images that add value to the text, enhance contrast and proximity, and emphasise the essay's thesis statement and overall structure. In the title, the image is of an empty office space that conveys the sense that something is wrong with this space and needs to be addressed or fixed to ensure that the employees are there. The second image is a picture of New Zealand's Prime Minister, adding meaning and providing context to the quality of the argument. The last image again reinforces the same idea that has been discussed in the thesis statement and adds emphasis to the meaning of the message logically and coherently. Also, frequently used thumbnails reflect the careful selection of these academic thumbnails. The sensory modality with high-quality contrast, proximity, and emphasis adds value to the argument and gives the reader a feeling that each image has been selected carefully to complement the overall theme of the blogpost.

The text mentioned in LLD 'contrast' did not provide details on its use. It is possible there was contrasting text (black and white) against a coloured background or vice versa to make elements stand out. Subheadings such as 'What is animal experimentation?' and 'Cruel or justified?' are distinctly placed close to the relevant text to show the connection. The use of questions in large font ('Should Animals Be Used for Scientific Experimentation?' 'Justified or Cruel?') created emphasis, highlighting the central debate of the blogpost.

There is a sharp contrast between the black text and white background in the LLU blogpost, making the text easy to read. The image also used the contrast between the dark cage bars and the lighter fur of the rabbits. This contrast draws the reader's attention to the image and the rabbits. Subheadings such as 'What is animal

experimentation?' were placed close to the relevant text, connecting the written explanation and the image. Leverage contrasting elements to highlight key points in the LLF blogpost. An image comparing average learner debt across different countries could be used. Place images strategically near relevant text sections to create a clear connection between the visual and written content.

The image showed a man sitting at a table with a pile of pills in front of him in an LLZ blogpost. The man looks down at the pills, and his expression is serious. The pills are the most visually salient element in the image. They are arranged in a way that suggests that the man is about to take a pill. The proximity of the text to the image created a strong association between the two people. In the LLL blogpost, the image of the people sitting around the table was the most prominent visual element on the page. It was placed high in the frame, occupying much of the space. This suggested that the image was essential for understanding the text's message. The people in the image looked down at their phones, creating a keen visual unity. This reinforced the idea that the blogpost was about smartphone use. There was a clear contrast between the people in the image, focused on their devices, and the text, asking about social connection. This contrast could be interpreted as suggesting that smartphones may be hurting social interaction.

Analysing Page-Flow – Semiotic Modes in Textual and Verbal Modes in Blogposts

Text-flow is often preferable when detailing complex topics or providing extensive explanations. In contrast, page-flow allows the structure to diverge from the linearity of traditional text (Waller, 2012), inviting more dynamic visual compositions, such as image-text complexes, to illustrate various stages of content in the academic genre. This structural flexibility is supported by the number of pages found using layout

structures that enable varied semiotic expressions. In some instances, however, solely relying on layout cues may not fully capture the intended semiotic mode. The integration of rhetorical analysis is sometimes needed, especially in cases where the layout appears as a visually rich text-flow. Here, page-flow identification depends on recognising the rhetorical structuring of content, reinforcing the necessity of cross-layered analyses to reveal underlying design principles. This multi-layered approach exemplifies the strength of the GeM model, although some misunderstandings about its layered analytical framework persist (Scott, 2021).

It has been argued that understanding page flow is central to any model addressing academic blogpost structures, and the role of colour as a semiotic resource is essential to help with navigation, especially in digital publishing. Analysing learners' generated DMC data reveals that page-flow in academic blogposts primarily segments content into manageable units, enhancing readability and comprehension. This segmentation creates identifiable content clusters that align well with the structure of academic genres, like in other educational formats (Bateman, 2021; Hiippala, 2012). Nonetheless, the data shows that page-flow may also employ the two-dimensional layout to create more complex structures.

An ultimate consideration about the distribution of text-flow and page-flow in the learners' generated DMC data warrants attention, and distinguishing between these flows allows us to question how technological advancements, such as using colour in desktop publishing, might have influenced the adoption of semiotic modes. Colours played assertive roles in establishing ethos and foregrounding actuality; natural colours are preferred in traditional ways. It may be argued that the blogpost quality is lowered by excessive colour saturation and distinction. Unlike Blogpost LLM, Blogpost conveys a less confident demeanour. The unconfident attitude

represented by external resources overshadows the confident attitude conveyed orally through attitude markers and modal verbs. For instance, the visual characteristics of the images, such as their gritty texture and greyish tone, are typically highly modal in documentaries but not on web pages. The pictures' obvious haziness communicates a lack of confidence.

To conclude, the presenting authority depends heavily on visual quality. There is a stronger sense of assertiveness in the blogpost titled '*Should Higher Education Be Free for All?*' due to the improved quality of the image. In comparison, the worst quality of the image in Blogpost LLZ gave out a less confident vibe.

The colour palette of this LLB blogpost uses subtle, darker shades of colours such as grey, blue, and black, with a mixture of white. The colour palette used here is the same, adding meaning and professionally advocating the message to the intended audience. The red colour palette is used intentionally and carefully as a resource to add emphasis to the subject. Even the colour palette used in the images has similar reinforcement and is in alignment with the same colour palette. As in the dress code, these colour palettes reinforce elegance, professionalism, and academic context. The use of colour palettes blends efficiently with the font's and framing's meaning-potential to influence the social orientations of this blogpost.

In LLF, navigating colour palettes used for this blog, such as blue, green, and yellow, is associated with knowledge, growth, or creativity, giving an impression of a positive and stimulating learning environment. In LLD, the text mentioned a blue-coloured header, '*The Daily Formanite*,' and a black and white image, building trust and sagacity toward the disposition of knowledge. The LLZ blogpost used a blue-and-white colour scheme, a colour palette associated with the health and education sector. In LLH, this blogpost used a bright blue and green colour scheme. Blue is often

associated with trust, security, and peace. These colours could convey that technology has made the world safe, secure, and positive. In LLL, the colour scheme was blue and white. The LLA blogpost used a bright and colourful design with various fonts. There were also several brightly coloured images throughout the blogpost, including a red banner at the top and a collage of images in the centre.

This LLB blog uses a bold font for the heading and a standard font for the text; all the subheadings are capitalised. This blogpost uses bolding effects for all subtitles in posts and is visible across. It produces an assortment of different combinations. The heading is in bold, white, sans-serif font, and the subheadings have all capitalised fonts. The subheadings have larger fonts than the title but with an assorted colour, i.e., black, corresponding to the title. In sum, the font resources are combined with variation and symmetry. Each category in the blog is divided into subparts and paragraphs, resulting in a multiplication of functional elements, making each category identifiable. The font is cohesive and consistent throughout the blog, interpreted as an academic blog; each font has been logically put forth to convey the meaning of the main argument. Font colour adds meaning to the cohesiveness of the meaning since the palette involves darker shades of black, grey, and blue with a blend of white that adds soberly to the blog. In social evaluation terms, the font seems, for instance, an expert use of font and affordance of mode while using the font in this blogpost.

The font choices convey genuineness and sophistication, which might relate to its viewer's peer-to-peer trustworthiness. The font in the layout of this blog uses academic meaning potential, silhouettes unusual interactions with the scholarly community, and advocates a clear purpose, which is to persuade peers and the academic community. LLZ's font is sans-serif and may be easily traced on a screen. In LLD, the text did not mention the specific font, but it is distinctly possible to use a

standard newspaper font that is easy to read and professional. LLF used an easy-to-read sans-serif font for titles and body text, whereas it considered using different fonts or sizes for emphasis. The LLU blogpost used a standard sans-serif font, which was distinctly chosen for print and digital media readability. In LLH, the text was set in a clean, sans-serif font. This type of font was easy to read on screens and in print, which made the blogpost more accessible to a broader audience. In LLL, the text is overlaid on the background image in a clear and easy-to-read font. The headline text is in a larger font and bold, making it stand out.

The design of the LLB blogpost has been addressed to add a meaningful contribution to the discussion and an easy-to-follow design. The design used in LLF was clear and uncluttered, promoting easy navigation. Sections might be dedicated to specific topics (e.g., 'The Benefits of Free Higher Education,' 'Challenges of Implementing Free Higher Education') with clear headings. In LLL, the background image showed a group of people sitting around a table looking down at their smartphones. The people were diverse in terms of age, race, and gender. The table was cluttered with coffee cups and plates, suggesting the people had been sitting there for a while.

It is interesting to note that in Toulmin's Model of Argumentation (1958), the ethos has not explicitly functioned as a separate element; several aspects within this framework of argumentation serve as the ethos that leads to establishing credibility in the argument and demonstrate the rhetor's authority over the subject. Ethos shapes the rhetor's ability to situate themselves as credible, strengthening their authorial ability to express and appeal to their intended audience. It is relevant to specify that even though the learners were not instructed on employing this specific element in their arguments, it is interesting to highlight that they made full use of ethos as a resource

in constructing their digital arguments in the ESL context. Using multimodal ways helped them establish ethos through colours, fonts, and images. Visually, the images' high colour saturation and differentiation transmit a definitiveness and commitment. A sense of formality and gravity is also conveyed when additional images are arranged against a black background. The black background gives the printed words authority when paired with white text. Modality depends on certain domains (Kress & Leeuwen, 2006). By incorporating these elements, the learners present as efficiently informed and fair-minded rhetors, which builds trust and strengthens overall ethos.

The narrative's world is characterised by colour, whereas the exposition is black and white. Kress and Leeuwen (2002, 2006) note that colours have cultural or domain-specific qualities associated with them. Academics tend to value black-and-white over colour since it is the colour of alphabetic print culture. It is the austere colour and the one that best represents the *'objective truth.'* Therefore, one could argue that it is appropriate to frame the factual fragment of the argument in black and white.

On the other hand, colour has a more extraordinary modality than black and white. We live in a colourful world beyond black and white. Colour conveys energy and joy. It makes sense to have it frame the argumentative component through colour codification. Thus, besides serving as a framing element, the colour scheme also conveys the interpersonal sentiments connected to the two components.

Results of Learners' Focus Group Interviews

Focus group interviews were conducted. Thematic analysis, guided by the Braun and Clarke (2006) framework to gain deeper insights into learners' perspectives, was then used to analyse the qualitative data collected. This well-established framework outlines six key steps meticulously followed throughout the analysis process

(discussed in Chapter 3). NVivo 14 software facilitated the analysis, but to ensure accuracy, the researcher also conducted a manual review to verify the findings. The section delves into the rich qualitative data from the focus group interviews, providing a detailed picture of learner experiences.

Theme I: Genre-Pedagogy-Based Instruction Intervention Outcome. The researcher initiated the discussion with straightforward questions about their experience composing their blogs using digital tools throughout the semester and how they found the instructions. The researcher keeps probing them for further explanation and their responses based on the DMC intervention, recalling various stages of the genre-pedagogy and what they achieve at each stage. The overall experience of the genre pedagogy was reported as optimistic and challenging. ELL14 expressed her opinion in the following way:

> *I learned how to compose essays digitally, and Open Education*
> *Resources are available, especially for the visuals; it was like*
> *just an experiment a hands-on on a different kind of platform, so*
> *I learned like I have this experience now that I can write a blog,*
> *any blog, or even if I want to create any webpage to present the*
> *content to the audience so I learned how to use free sources and*
> *how to present my ideas. (ELL14)*

Nevertheless, learners reported challenges, too, which will be reported under a separate heading below. Nonetheless, the current theme has been further divided into three emerging sub-categories to highlight the skills and concepts they learned during this intervention.
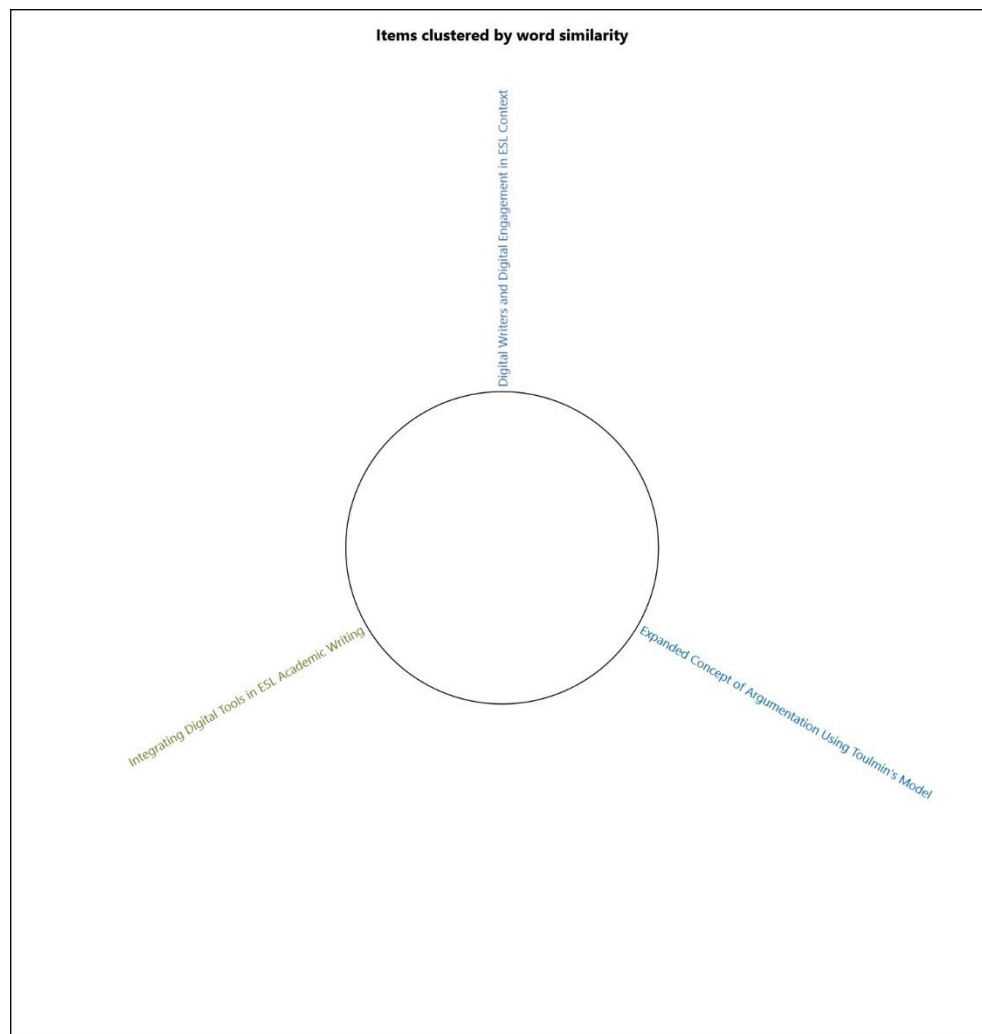
Figure 4.21: *Item Clustering Based on Genre-Pedagogy*

Focus Group Interview Data Analysis at Each Stage of Genre-Based

Instruction. Two primary categories emerged from the data gathered from learners'

digital argumentation essays and focus group interviews: learning content and genre-

based instructions. Pertinent topics were integrated into the analysis under each

writing stage in the instructional design of the study to provide a thorough analysis.

The procedure was used because, depending on their areas of interest, each participant

developed their thoughts with a distinct emphasis. Each interviewee was labelled with

an LL (language learner) number, while each essay writer was assigned a W (writer)

number followed by a T (topic) number.

Building the Context. At the stage of intervention, which lasts over four weeks, the learners were introduced to the academic writing conventions and argumentative writing in particular, and most of them found the stage quite helpful for them to lay the foundation for argumentative writing and appreciate the genre in academic writing. When the learners were asked to reflect on this stage during focused group interviews, all the respondents found it relevant to learn and understand the basics of argumentative writing through genre pedagogy, the structure of an academic essay, and how to develop an argument logically. Contrariwise, a few learners revealed that this was not the first time they had learned argumentative writing and would have done the primary level during previous academic studies. They all agreed that they knew more profoundly and in detail for the first time. This stage was quintessential for them as they were also introduced to the visual rubric criteria and were fully engaged in understanding it. They acknowledged that this step helped them learn what to include in their argument to make it coherent and how the instructor would evaluate it. This process helped them gain familiarity with the logical elements of argumentative writing.

When asked what could have been improved at this stage, most agreed to give detailed instructions on using structural and logical features in their writing. Twelve out of twenty-six respondents agreed because they anticipated receiving more extended instruction and more thorough explanations of what to use for writing. Two participants, in particular, felt that the orientation period should be extended, citing the need for a deeper comprehension of argumentative writing strategies, and building the context sessions focused on common errors.

Also, when they were asked about their understanding of Toulmin's Model of argumentation and how it helped them learn and structure their academic arguments,

the learners agreed that this model of argumentation facilitated this process and enhanced their understanding of constructing a scholarly argument. They all decided that learning through mnemonics in class was fun and exciting. On the contrary, when applying the model, some learners had difficulty approaching it correctly as they found certain aspects confusing and complex. They found claims and rebuttals exciting and easy to understand and elicit. However, they have had difficulty differentiating between progressively categorised parts, such as data, warrants, and grounds, even though they all belong to the same general category of evidence that supports a claim. When it came to visual rubrics, they revealed that they had no idea how to produce academic blogs, but all of them agreed that this was the first time they learned about visual aspects that were to be implemented in their academic arguments later. When the instructor explained what each component meant and helped them practice, it started making sense to them. They were also put into practice with different website-building tools and techniques, and were directed to learn Google Sites for the specific assignment.

The feedback from the learners in a focused group interview revealed that this stage has helped them build the context, as referred to by its name. Notwithstanding, it is noteworthy to understand that such interventions have been designed to evaluate for the first time in a specific context and typically addressed the overwhelming response from the learners to help them acclimate themselves to the writing process, academic writing conventions, rubric structure, and how any assessment pattern would operate. It could be seen as a covert indication that they were under abundant mental strain or experiencing additional language skills and genre-specific knowledge difficulties. The instructors should keep these aspects in mind while designing such writing interventions for the ESL context because, in specific contexts, writing

anxiety might jeopardise their ability to produce academic essays. It can be achieved by having a clear set of instructions and assessment practices, and should develop representative ways for understanding argumentative writing. Another aspect would be considering taking on board learners in designing the rubric for such argumentative writing tasks.

Similarly, learners benefit from opportunities to construct sentences and paragraphs with logical flows based on an efficient understanding before they begin their writing tasks. Given that what they learn at this stage is crucial to their writing later, it is intriguing that the data indicate that the interviewees frequently stressed this building that the context stage is equally as grave as the actual writing stage. Given the brief time for warm-up assignments each term, instructors ought to consider the tremendous value that learners place on this stage. Next, they ought to organise a selection of efficient and successful exercises and educational materials based on the writing proficiency of the learners.

Modelling. In modelling the task over three weeks, they found that different steps at this stage had been helpful for them, such as providing them with a clear understanding of what needed to be done in this task. The instructor introduced the idea and substance of information about various components of argumentation, such as formal, rhetorical, and subject levels, and requested that they investigate the internet resources accessible for writing according to their areas of interest. Using academic websites and semiotic resources, the instructor assisted learners in dissecting academic texts by imparting knowledge about various aspects and written argumentation expressions. The instructor guided learners to apply a framework for genre knowledge to analyse each of their separately gathered articles. The instructor

facilitated group discussions, posed questions, created charts, and prompted the learners to use and review academic web pages of their choice.

Except for three in the initial interview, every respondent said brainstorming was required before writing. The focus group interview was also validated because 21 out of 26 respondents felt that using mind maps for brainstorming was beneficial. However, four interviewees said they did not mind if there was no brainstorming, and one said he preferred not to use it. It was to accustom them before they began writing. They were producing thoughts as they considered their stance and justifications. A minority of learners unfamiliar with brainstorming before writing suggested that brainstorming exercises be conducted beforehand or thoroughly explored, particularly for more extended essays and writers with less experience. One of the respondents reported that at this stage, it was helpful for them to start with brainstorming to save time and sequentially organise their writing, especially for argumentative writing. It also referred to the fact that they would prefer diverse ways of brainstorming, such as outlining and listing, which helped them to save time and arrange themselves as academic writers. However, the instructor made sure to make all information available efficiently beforehand on their digital learning portal, i.e., Moodle. Contrarily, in digital multimodal composition, the learners found it hard to apply and run the digital applications, text typing using the keyboard, writing together with finding the right visual for this task, and following Toulmin's Model of argumentation (1958), all at once. It reflected the learners' perceptions of the visual rubric as they considered it complicated to incorporate writing and visual components. It infers that the general attitude toward intervention was more negative than positive, as they found it overwhelming.

Learners' reviews of their essays indicate that they would be more adept at self-monitoring, thoughtfully considering, and revising their work before and after peer reviews. To measure argumentation quality using standard evaluation criteria, the first rubric, developed based on Toulmin's argument elements, enables learners to establish more objective and unambiguous points of view. This result demonstrates that the first rubric's categorial components were crucial in fostering logical coherence and motivating learners to adhere to its procedural structure, even though it was sometimes difficult to distinguish between the two sections, which are covered in more detail later.

Although the initial interviewees said they felt under pressure to employ each argumentative component in the rubric, they had to write for longer. The rubric was supposed to help the learners establish their logical structure more quickly. Since the first rubric included a rebuttal category, many interviewees felt tempted to bolster their logical framework with rebuttals.

Surprisingly, every interviewee stated that they would not like to have too much assistance while creating their first draft regarding supporting materials, for instance, articles, a list of pertinent words, and details of consideration. It was often said that they might be discouraged from implementing dictionaries or looking up information that supports their viewpoints in favour of passively relying on the instructor's provided materials and writing essays that seem like their peers if they receive enriched input. Nonetheless, the learners recommended a suitable time to offer all auxiliary material. Three respondents in the focus group interview said they did not want any additional material from the instructor, while five respondents in the first interview said that all the supporting information might be provided after the initial drafting stage. Learners who believed they could find essential materials

independently and viewed essay drafting as solitary work indicated a lack of perceived need for additional support at this stage.

Overall, even though learners thought modelling would be required, the results indicate that learners should be given a variety of brainstorming activities through modelling. Consequently, they can choose the one they are most comfortable with and apply it more quickly and easily. Additionally, the learners anticipated receiving more language assistance to create the content during this first draft stage in place of reading resources, indicating that their inability to speak English efficiently is a crucial obstacle to writing a fresh essay. The learners took the writing rubric of each category gravely and incorporated it into their initial drafts, viewing it as a valuable guideline to follow when writing. The rubric focused on overall organisation, structure, and logical processes.

Joint Construction. The instructor organised actions in the classroom that support the development of learners' knowledge (e.g., arguing with the audience, arguing with a goal, and structural, linguistic, and content types). The instructor demonstrated how to create their profiles using Google Sites. Learners constructed a personal knowledge framework in argumentation and digital resources. The instructor organised activities to develop persuasive written content with learners and allowed learners to practice Google Sites and similar web pages. Later, the instructor reviewed the argumentative and VG-informed visual rubric with learners. Learners constructed argumentative written texts in groups with instructors' support and later published them using other semiotic resources. All participants felt it was a helpful writing stage as it helped them consider how to work collaboratively toward a common goal for digital multimodal composition when revising their writings; learners used input from

peers and instructors, reviewed the writing rubric, and considered what areas to emphasise in their comments.

In addition, eighteen out of twenty-six initial feedback sessions should be mandatory, according to respondents in the focus group interview, since learners would not be eager to provide initial peer feedback if it were discretionary or skippable. Remarkably, during one focus group interview session, all four respondents concurred that receiving and giving feedback was enjoyable and that having additional group members would benefit from doing more review work at once.

While most respondents placed a high value on the initial feedback stage, both interviews indicated that peer input is valuable only if certain conditions are met. Everyone in the first interview felt that peers' English competence was crucial since constructive peer evaluations with strong participation and reliable revision may offer insightful criticism to others. More specifically, every interviewee in the initial round believed that group members' sense of responsibility and their degree of English writing ability determined the number and quality of peer critiques. In the focus group interview, two participants underlined how important it is for responsible and conscientious group members to share enlightening critiques. Regarding this, two interviewees stated explicitly in the focus group interview.

The results demonstrate that it was challenging for comparatively lower English language learners to identify and discuss the weak areas of the essays written by higher-level learners. The benefit was that lower-level learners had excellent opportunities to pick up practical vocabulary from better-written essays. For collaborative learning, participants in each feedback group ranged in writing competence from poor to high. Additionally, learners in the interview mentioned that

they developed their next draft by consulting and implementing input from peers and instructors. They relied more on instructor feedback since they did not think all the remarks made by their peers were accurate; therefore, not all the input was accepted.

In the focus-group interview, the lone participant who expressed dissatisfaction with the initial peer feedback stated that only input from more advanced peers was helpful and that feedback from peers who were less proficient in English was distracting. On the other hand, most learners thought the criticism they received from others was valuable and pertinent; very few of them had encountered unclear, hostile, or superficial remarks from others.

An increased reliance on the instructor's feedback was frequently the outcome of the initial peer feedback's low reliability. In the interview, seventeen respondents admitted that they relied more on instructor input than peers, citing that they read the instructors more carefully and found it to be correct. Two respondents in the focus group interview said they attentively studied the instructor's input but only skimmed peer comments, despite one respondent in the focus group interview stating that he paid equal attention to both the feedback. According to one respondent, peers had a better opportunity to actively contribute to first peer feedback than second peer feedback, which allowed them to improve on each other's writing.

The assignment of group members, or whether diverse learners are mixed in a group or similar levels of learners are placed together, directly affects the reliability of peer input. The second peer review took a more severe view of this problem since it forced learners to pay more attention to logical consistency and a broad framework than to language and style problems.

All the interviewees acknowledged that, despite the rubric's great worth, it was difficult to comprehend and that they lacked some clarity on the categories in

disputes, such as warrant and ground. All the interviewees recommended combining relevant and detailed components for deeper comprehension and more straightforward evaluation. The writing rubric's detailed categorisation may be more complicated than anticipated, making it more difficult for learners to rate or remark on others' initial drafts after completing each step. As for the visual rubric, they also started appreciating how words complement visuals and how each component thoroughly helps them in meaning-making.

According to the results, learners anticipated receiving insightful criticism from others to enhance the content before making minor adjustments. It makes sense that non-native English authors would want assistance with language usage instead of substance. The research suggests, at all events, that learners place a high value on helping with content development, including argumentation. Hence, instead of emphasising feedback stages for minor edits, argumentative writing courses should concentrate on drafting and feedback phases for content organisation, which includes argument building.

Independent Construction. The instructor organised formative feedback and autonomous writing exercises, and learners employed their understanding of argumentation while adhering to the visual rubric. While reviewing the writing and VG-informed visual rubric, learners actively engaged in self-reflection and individually applied their knowledge of argumentation in writing. Because they were not native English writers, the learners frequently felt apprehensive about their linguistic clarity and accuracy. Therefore, they gave careful thought to grammatical precision and suitable word choice. Assessing the learners' strong inclination to annotate sentences for peer feedback is now essential.

When considering the amount and calibre of the second peer feedback, the learners tended to exhibit more direct and active participation in peer review activities. Some learners may still find peer editing on the sheet a more straightforward and practical option. Contrarily, the fact that more learners participated in the feedback process when they had the option of online editing suggests several potential advantages for a digital writing classroom. First, the anonymous learning setting, where Group members' opinions of their English writing abilities were not considered, may have encouraged learners to take part in peer assessments, given their lack of confidence or prominent levels of worry about proper editing. This proposition results from the fact that they are less obligated to uphold public standards or risk embarrassing themselves.

In response to questions about the importance and necessity of the final draft stage, every learner in the focus group interview stated that submitting their work and receiving a final score was essential. All the participants in the focus group interview believed that this was the last opportunity to refine their writing to achieve better marks or self-satisfaction, which led them to think that this was the topic's ultimate result. In the second interview, only one respondent agreed on the necessity of another opportunity to proofread before submission. In the second interview, most participants stated that the general sequence should not be too long because doing so would make them fatigued and bored, and make it harder to help others further. Twenty respondents in the interviews expressed optimism about their progress, while nine voiced scepticism about the appraisal of the final document based on the degree of advancement from the first to the last draft.

Furthermore, six participants in the follow-up interview proposed that the instructor choose and distribute high-quality essay examples from classmates

following submission. It was primarily due to their belief that publishing and sharing their work with others was neither necessary nor essential for them as learners. To improve their English argumentative writing skills, they concentrated on writing exercises. In general, the respondents expressed reluctance to make their work publicly available. Only twenty-one interviewees in favour of publication agreed to let other people see their work, while five preferred to save it and reread it independently. For most learners, publishing their final work was a valuable way to present it to a broader audience.

The results show how class time was distributed for instructor training while considering the grave and joint issues and recommendations raised by the participants in targeted focus groups. The writing course in this study is based on a genre-based writing approach, which theoretically allows for a high degree of freedom and autonomy for learner writers. Contrariwise, the results show that specific stages of the writing course require more focused or direct instructor intervention for ESL learners. In a writing course, learners are more prone to rely on instructor guidance, including comments during the drafting stages, because they, as non-native English writers, often experience significant pressure and nervousness related to writing in English and arguing. Some learner writers, especially those who have not written in English as much, hope to receive more one-on-one help from the instructor. An argumentative writing course that is customised for ESL learners should include the following, depending on their needs: a more thorough orientation phase with specialised teaching and learning materials; more focused instruction in Toulmin's argumentation components; and streamlined rubric categories for both more straightforward and more precise understanding of the rubric; increased learner participation in an anonymous online writing environment; and the instructor's delayed involvement.

Theme II: Digital Writers and Digital Engagement in ESL Context. The first sub-category from the intervention is that the learners emerged as digital writers and found digital engagement in the ESL context much more fruitful and rewarding. All learners agreed they had learned and sharpened their digital skills during the genre-pedagogy instructions. They understood the importance of having a clear objective and genre awareness before drafting an academic essay. ELL1 reported his opinion in the following way:

> *I did understand critical thinking, audience awareness, and how I should provide a particular viewpoint so that the audience might be convinced. After finishing this project, I now understand argumentative writing better.* (ELL 2)

Another Learner notes the following about this DMC intervention:

> *While creating my DMC project, I gained valuable insights into multimedia tools, the effective integration of visuals and text, and the importance of clear communication. Additionally, I have learned about time management, creative expression, challenges, rewards, and conveying a message through diverse modes and formats. (ELL13)*

Most of the learners explained and agreed that the experience helped them to be better digital writers and engage and connect with the digital academic audience effectively. Another learner, 2, notes that *'the DMC project was a significant learning experience for me from acquiring the technical skills needed for blog writing.'* They also agreed that they learned how to engage themselves using several modes of communication, such as images and videos. ELL 4 noted the following:

> *The ability to engage readers through diverse media, using different visuals, and the satisfaction of effectively presenting a complex argument through various modes of communication helped explore diverse modes to engage the audience. (ELL4)*

Two learners, ELL5 and ELL8, termed the experience an invaluable skill in learning digital multimodal composition, which helped them improve their technical and writing skills.

Theme III: Expanded Concept of Argumentation Using Toulmin's Model. The second most vital component of the DMC intervention was to teach learners to understand and sharpen their argumentative writing skills through genre pedagogy using Toulmin's Model of argumentation (1958). Therefore, the theme emerged organically as part of these focus group interviews as the researcher asked them about their understanding of argumentative writing and their thoughts about its implications and applicability within an academic context. Most learners agree that during the genre-based intervention, they learned argumentative writing and have had positive experiences learning and building arguments. ELL1 notes the following about argumentative writing:

> *It provides both the positive and negative aspects of a particular viewpoint. It has aspects like patterns, like the first introduction, then the body paragraph, then counterarguments, and all the evidence that provides a strong viewpoint to convince the audience. (ELL1)*

After the genre pedagogy, almost all learners have understood what argumentative writing as a genre involves and what pivotal aspects to consider while composing an argumentative piece of writing. The model enabled them further as ELL 10 notes that *'argumentative writing involves much research for evidence to back his claim, and then it also involves. It involves rebuttals and counterarguments that the writer must consider in their essay.'* (ELL10)

The researcher probed each learner about what argumentative writing is for them and how it was helpful for them, and almost all of them covered several aspects of argumentative writing and Toulmin's Model one after the other, as ELL12 talked

about the importance of the main argument and counterargument, to which ELL15

supported staunchly. ELL 16 added that *'this is done by providing concrete proof,*

facts, and figures and discussing differing views' (ELL16).

One learner, ELL6, reflected on other aspects of this model, such as qualifiers

and backing in the following words:

> *I have structured the writing part according to Toulmin's*
> *Model of argument. I have tried to cover all the points and*
> *use counterarguments and qualifiers to support the*
> *argument and make it more relatable to the readers.*
> *(ELL6)*

Success in life comes from taking risk and
chances ?

Success

success is something that everybody wish for in their life.
Everyone have their own perspective and definition towards
success. Some want to be happily married, some are career
focused, getting famous, financially stable etc. But the
question arises, is that really easy to achieve success in life?

RISK IS THE
DOWNPAYMENT
SUCCESS

Risk Taking

I totally agree with this statement because when we take risk we have to face
plenty of failures, but we challenge ourselves and have to push our boundaries
to come out of our comfort zone, because success requires a lot of struggle and
courage. But risk opens door to opportunities and different experiences.

"IF SOMETHING IS
IMPORTANT ENOUGH
YOU SHOULD TRY,
EVEN IF THE PROBABLE
OUTCOME IS FAILURE."
ELON MUSK

Elon Musk

Figure 4.22: *Blogpost Indicating Learner's Multimodal Argument Following*
Toulmin's Model

ELL2 mentioned this genre's importance as it helped develop critical thinking,

logical coherence, and a deep understanding of the subject matter, whereas ELL22

talked about the importance of cohesion and coherence in a logical argument. She

further added the following:

> *This may include combining written text with visual*
> *elements such as images or graphs to enhance the overall*
> *impact of your arguments.* (ELL22)

All learners expressed satisfaction that they learned about several aspects of argumentative writing, and Toulmin's Model has been helpful. At all events, some learners mentioned their frustration in finding qualifiers and grounds for their DMC projects. They also added that building and presenting a nuanced argument (as ELL3 mentioned) requires thorough research, reading, and command over the subject matter. ELL5 called it a way to engage with the audience through a multifaceted approach.

Theme IV: Integrating Digital Tools in ESL Academic Writing. Another pivotal theme from these focus group interventions was their perceptions of integrating and including digital tools and digital multimodal composition in academic writing. The researcher probed them on their integration experiences and beliefs about inclusion and integration. The researcher provided them with context for inclusion in ESL academic writing courses. One of the learners, ELL1, highlighted a pivotal aspect of inclusion in the following words:

> *Each element you integrate, any picture, any video, any*
> *image, or any interactive element, should serve a purpose*
> *and enhance the meaning of your work. It should not be*
> *out of your context. (ELL1)*

ELL17 explained the importance of visual aids in making a writing project interactive. ELL2 seconded his opinion with ELL17 and suggested integrating various media, such as pictures and videos, in academic writing, as it allows one to express ideas creatively.

Nevertheless, the researcher found that the learners were divided on including DMC in ESL academic writing, as some learners did not favour including it and making it a mandatory component, as they faced problems creating, developing, and

publishing their blogposts. One of the learners of ELL6 termed it futile and time-consuming. Nevertheless, another learner, ELL8, considers simplicity the key to an influential blog. ELL 5 notes her reservations in the following way:

> *Writing a multimodal blog poses challenges compared to drafting a traditional paper due to the need for the effective integration of various forms of media. (ELL5)*

On the other hand, certain learners favoured including DMC in academic writing, as ELL22 considered combining various modes to enhance effective communication. ELL3 notes, *'multimodal blogs do involve the integration of various media elements such as images, videos, and potentially interactive features, which I love doing, compared to what a traditional paper or a drafting paper does, which focuses on the language used and the structure and the argumentation.'* (ELL3)

Another learner agreed with the importance of including DMC in the following words:

> *It has also refined my research abilities and honed my capacity for effective communication and portraying my point of view across different media. (ELL5)*

Theme V: Challenges Faced by Learners. One aspect of integrating was to report the challenges the learners faced while composing their DMC projects, and each learner was allowed to reflect and share any challenges they encountered while producing their blogs. Almost all learners agreed they found it challenging to learn DMC, as there were multiple factors to take care of in developing DMC. One of the challenges that ELL7 highlighted was that each mode should be carefully thought of and express their ideas in the following way:

> *Multimodal composition projects carefully plan their visuals and textual elements, ensuring they complement each other to convey a cohesive message and emphasise the importance of a player's purpose and audience awareness for effective communication in multimodal text. (ELL7)*

Some learners expressed their apprehension about using technology, and some reported the challenges they faced with the Google Sites interface, and that they would need extra time and support to understand what it was and how to use it to compose and publish their blogs successfully. Others expressed their frustrations over finding a suitable mode to convey the right message or navigating the freely available resources to include in their projects. One of the learners, ELL7, noted differently and stated that the DMC project interestingly challenged my creative side. ELL10 states that *'personally making a multimodal blog is a bit harder than drafting a regular paper. It is a challenge to use different modes to communicate.'*

ELL15 noted the following about using Google Sites:

> *I would advise you not to use Google Sites for the blog;*
> *instead, use any other available application or website, as*
> *they are user-friendly. It was not easy to grasp tasks*
> *compared to drafting a whole paper.*

Other learners confronted several issues, including finding the right balance between text and visuals and technical problems with handling and publishing blogs. Some learners termed blogs complex and tricky, while others found layout and design the most challenging aspect. ELL14 noted that designing a blog is overall a difficult task in the following way:

> *I found writing a multimodal blog to be more difficult than*
> *drafting a paper, as while drafting a paper, one can easily*
> *write and refine their work without any technological*
> *problems. (ELL14)*

Three learners were disappointed with the selection of their images and noted in the following way:

> *The pictures that I used were of low resolution, blurry, and*
> *unclear. (ELL9)*
> *Some pictures I have used might not be visually appealing*
> *enough to the audience, or the colour scheme or theme*
> *may be duller or may not match every picture, making the*
> *blog lose its sparkle. (ELL15)*

Two of the learners expressed their obstacles politely and called it an

efficiently rounded experience in the following way:

> *Navigating the ins and outs of publishing content online,*
> *ensuring proper formatting and addressing, and dealing*
> *with technical hiccups posed a slight obstacle. Overcoming*
> *this required additional effort but ultimately contributed to*
> *a more well-rounded learning experience. (ELL20)*
> *The main thing I learned from creating my DMC project*
> *was patience. It took so much trial and error to figure out*
> *what worked and what did not with the different formats.*
> *(ELL12)*

The researcher derived the following word cloud from NVivo software to

report the most frequently used words when learners were asked to reflect on their

challenges. It indicated that the learners faced difficulties in developing their DMC

and that the most repeated words inferred that the recurrent issues were related to the

multimodal composition's technological aspects, among other topics, including

finding relevant visuals and uploading and publishing their blogposts.

Figure 4.23: *Word Cloud Indicating Most Frequent Repeated Words Learners Faced*
Challenges

Theme VI: Successes in Producing DMC. Next to the challenges, it was interesting to consider what the learners thought they had learned and what their final product was. All learners reported discovering critical digital skills and tools to help them succeed academically. Some went afar and said that it helped them learn how to present and create online content for specific audiences using specific modes, genres, and digital tools. One learner hailed DMC as a critical research experience. ELL6 notes the following:

> *The effective use of text, visuals, and graphics, the positive feedback from the instructor, and a compelling narrative. I learned how to use free source Open Education Resources (OERS), which are available, especially for the visuals, and it was like just hands-on on a different kind of platform, so I learned I have this experience now that I can Write a blog, any blog or even if I want to create any webpage to present the content to the audience.*

Many learners expressed their feelings of fulfilment after publishing their blogs, and they found them engaging and creative. ELL10 notes that experimenting with visual elements enhances *engagement and discovering new ways to present complex ideas.*

Some learners expressed their feelings and success in the following ways:

> *I learned many new things about how to structure an argumentative multimodal composition project, like how to use a screen recording app, how to use Google Sites, how to structure your argumentative essay, and what picture you should use to make your blog more visually appealing. (ELL9)*
> *During my multimodal blog project, I had a positive experience, such as the opportunity to create and develop a more dynamic and visually appealing communication style than traditional paper writing. (ELL4)*
> *Positive experiences were learning ways to engage the audience and creative expression, like I got to learn. (ELL16)*
> *The blog consists of visuals, tools, and writing, which are more useful for writing. It is easier to manage than drafting a paper. It makes the experience more fun for me. (ELL10)*
> *It was fun to play around with the tools and make boring argumentative writing into a fun-looking blog. (ELL17)*

The following word cloud was derived from NVivo 14 software to seek the recurrent words while the learners discussed their successes in developing their DMC blogposts using Google Sites. It indicated that the digital multimodal composition harnesses their creativity, and they could communicate through multiple modes, which could encourage educators to use multimodal components in their teaching.

Figure 4.24: *Word Cloud Indicating Most Frequent Repeated Words Learners' Having Success*

Theme VII: Perceived Affordances of Composition with Technology. The last theme that emerged from this DMC intervention was knowing their perceived affordance of composition with technology and digital tools. When the researcher inquired about their preference for composing traditionally or with digital tools, most learners agreed that digital multimodal composition offered more possibilities for them to engage themselves, and they would prefer a digital composition project over a traditional paper for their future projects. The learners' affordances for composition with technology included endless possibilities to express themselves innovatively.

They found certain features advantageous, including collaboration, learning with fun, and ease in handling technology, as many agreed that there was something new for everyone to understand. However, some learners said they would prefer to compose blogs on different sites next time rather than Google Sites. The following graph indicates that most learners were inquisitive about producing blogs for future projects.

Graphs 4.15: *Reflecting Learners' Preferences for Digital Over Written Texts*
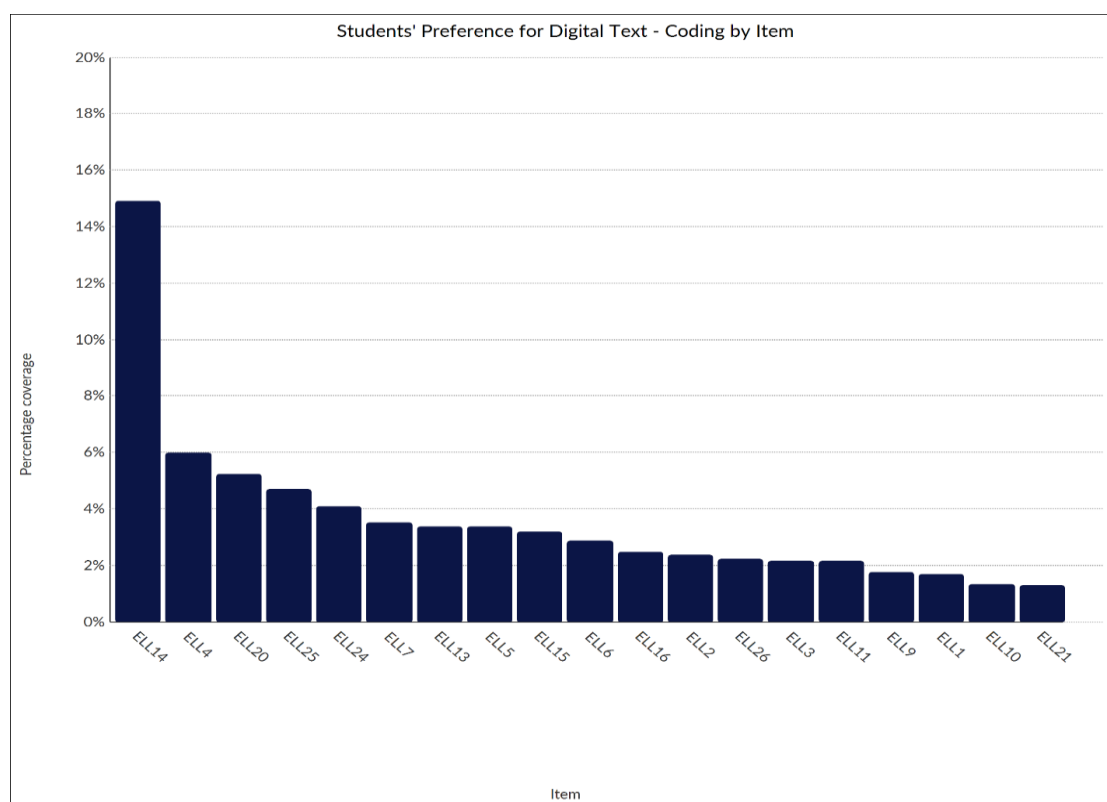
Graph 4.16: *Illustration Reflecting Learners' Digital Affordance in DMC Process*
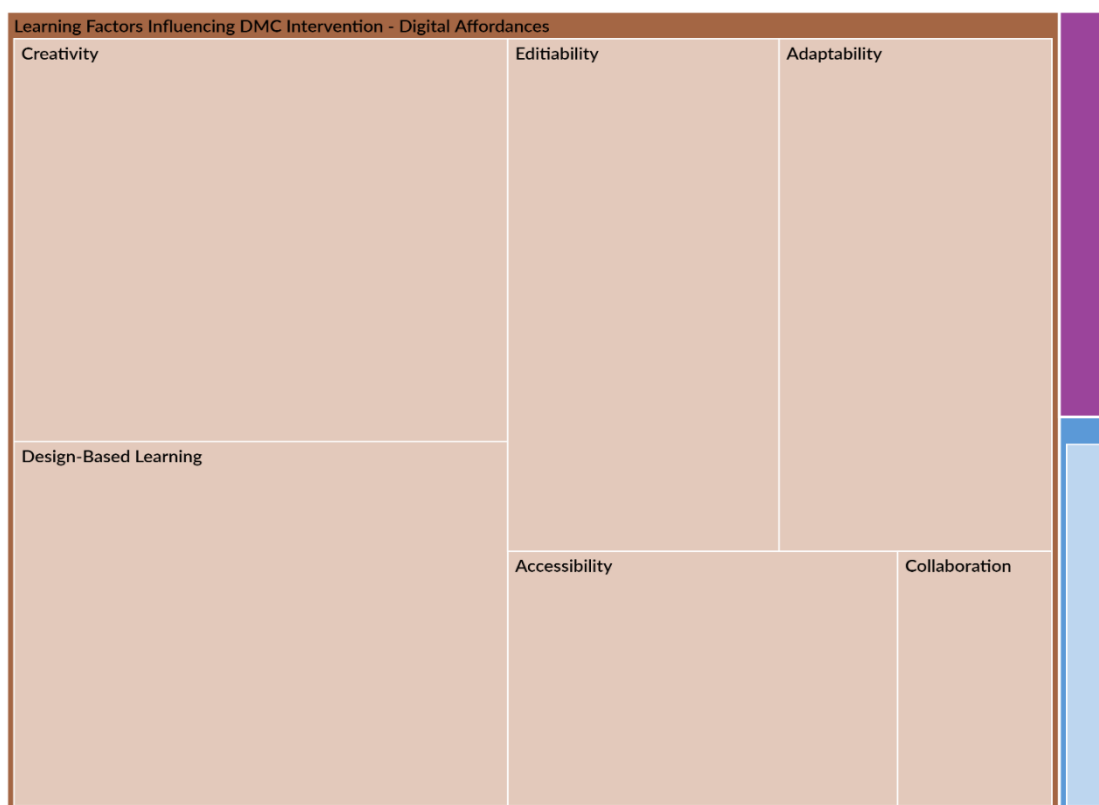
Contrariwise, their preference for the DMC blog was due to various digital affordances that helped them produce a DMC blog that was much more resourceful than simply writing with pen and paper. One such affordance that emerged out of the focus group was editability. The learners who struggled with spelling, editing, and proofreading their drafts, such as the spell check resource, made them feel confident with the structure of their essays. ELL1 notes that:

> *I also edited and re-did it, and I made many changes as it allows editing to be an advantage.'* (ELL1)

Other learners expressed these affordances in the following ways:

> *Typing and multimedia tools skills can be refined through consistent practice.* (ELL13)
> *I learned how to present well, use different templates, explore different templates I use, and organise my information in a way that is interesting and easy to understand. (ELL18)*
> *I am glad I got the chance to revise it.* (ELL3)

Another digital affordance that emerged from the theme and data was the adaptability,

usability, creativity, and accessibility of digital resources and composition. ELL 10

notes:

> *I had to collaborate with my friends, and I got to use this new website, a new forum called Google Sites, which I did not know about earlier.* (ELL10)

Other learners expressed these digital affordances in the following ways:

> *There is also an aesthetic and graphic aspect to remember while focusing on writing material and quality. (ELL16)*
> *I learned how to properly structure an argumentative essay, create content-related designs, and always use attention-catching words, phrases, and fonts together with colours. (ELL17)*
> *These images are aesthetically pleasing and highly relevant, enhancing the overall narrative and effectively communicating key points. The combination of compelling visuals and well-crafted content makes for a compelling and impactful presentation. (ELL2)*
> *It gives me a new perspective on looking at monotonous writing. Now, I can see potential in every non-visual article or story. (ELL9)*

Results of Instructors' Perspectives on Inclusion and Assessment of DMC in ESL

Context

Theme I: Inclusion of DMC. All instructors agreed that Digital Multimodal

Composition should be part of the academic writing curriculum in the ESL

curriculum, as they believed that technology has swayed all parts of the curriculum,

and with it, writing is not possible. They all opined that including digital multimodal

composition in the academic writing curriculum would bring new perspectives to

writing classes. One of the instructors, D, termed it as follows.

> *It is a breath of fresh air for the classes and expands our learners' skill repertoire. It will prepare them better for the upcoming writing tasks and job market skills because there will be a lot of jobs available in the future in terms of content writing on websites and jobs like that.*

Another instructor believed that including digital multimodal composition would be an exciting initiative in the following way:

> *Multimodality changes the classroom, which is very interesting because it brings much cultural depth and transcultural awareness. Other than that, it opens a new door to many different arguments, ideas, and ways of thinking and perspectives; it offers a way to address multiple intelligences in our classrooms and numerous learning styles.*

The researcher was interested in investigating the diverse ways in which instructors integrate technology into their ESL academic writing classes. So, it was interesting to note that the instructors used a wide range of technology in their writing classes, such as presentations, podcasts, video lectures, virtual tours, digital storytelling, and Infographics. One of the instructors, C, responded that the use of technology solely depends on the purpose of the writing task and that it is aimed at increasing the possibility of engagement with learners to make them interested in content.

> *I find multimodal approaches instrumental. I engage my learners in activities that promote visual, auditory, and written learning styles.*

One of the instructors believed that the university instructors have been overburdened and do not have time to incorporate technology in writing classes.

> *Once, when I was a fresh instructor, I was freshly trained and newly qualified. I was enthusiastic because I had more time to incorporate new, innovative, and exciting activities into my class activities.*

One of the Instructor E notes that:

> *I think it should be left to the instructor to decide whether he wants to use multimodal composition or not. We can encourage multimodal composition in class, but making it mandatory could sometimes be counterproductive.* (IE)

She noted that:

Multimodality brings versatility to the academic writing classroom. It allows the instructor to reach out to multiple learners with different abilities simultaneously. It makes the overall learning more flexible. It promotes knowledge and understanding. (IE)

When asked about the anticipated challenges that the inclusion of DMC might bring forth in the ESL Pakistani context, they highlighted several challenges, including the provision of reliable internet connectivity, electronic devices, instructors' training, and lesson plans as one of the instructors' C, noted that *'integration and inclusion of multimodality into academic writing comes with its own set of challenges.'* Another Instructor, D, pointed out that including DMC in academic writing creates opportunities for developing digital literacy, reducing concerns related to plagiarised content, and accessing OER.

Theme II: Assessment of DMC. Another theme that emerged from the DMC inclusion in ESL academic writing was ways to assess it, and all instructors believed that an integrated approach should be devised to evaluate learners' DMC tasks while considering all stakeholders' perspectives. They all agreed that setting clear learning goals and objectives would help the inclusion be much more effective and valuable, and such a framework would allow learning environments to be supportive of generating ideas and foster learners' ability to communicate, comprehend, and create using different modes. However, it was necessary to note that the three instructors emphasised the importance of peer review, reflection, and presentation of the DMC assessment framework.

Instructor G noted that *'my learners in academic writing are willing to write, engage themselves in reflections, and enjoy themselves while presenting.'* One of the instructors, D, highlighted an illustrious aspect of learners' agency and choice in the DMC process of assessment, and she expressed it in the following way:

Some learners incorporate visuals and graphics into their writing or research because I encourage them to use flowcharts, diagrams, pictures, and graphics. After all, that helps in clarifying the examples. But I constantly probe what they do and why they choose this way. I think multimodal composition should be mandatory for learners to reflect on and trust their sense of the design process in an academic writing class.

Theme III: Valuing DMC in Academic Writing. When asked from instructors that what they value most in their learners' academic writing drafts, the instructors came up with a range of several components that they value most; despite everything, all of them agreed that they look for originality and organisation of ideas, accurate use of language, appropriate language, genre, delivery, and range of ideas to be incorporated into academic writing. When it was asked what they would value most in a digital multimodal task for their learners, Instructor C responded in the following way:

What I value the most in multimodal composition tasks is the ability to develop a writer for multidimensional tasks related to non-academic writing. These learners are ready for the upcoming world that is more technology-oriented.

Another instructor, D, responded that with the changing ways and rapid technological interventions, instructors and academia should take heed of those changes and allow learners to explore multimodal ways of writing and composition.

I think we have come to this point now in today's world, especially now that we need to change the teaching approach because the learners today are much more demanding. They're much more aware, and as the landscape is changing in academia, I think we need to modify our teaching approaches as well, and provisions for multimodal learning should be provided to learners.

Instructor G responded about value in the following way:

The thing that I value the most in multimodal composition tasks is the ability and development of a writer for multidimensional tasks related not only to academic writing but also to real-life writing like writing for websites, writing for blogs, developing themselves, and getting themselves, these learners ready for the upcoming

world, which would be more technology oriented. So, I feel the most valuable thing about multimodal composition is that the learners would enjoy it the most, and it would not get boring. Second, it will develop learners' writing skills in multiple ways.

Summary of the Chapter

Evidence suggested that learners' mean scores on the study's genre-based instructional course showed improvement in terms of their argumentation and visual representation from before to after they enrolled. The impact of their writing differed significantly. The developed digital instructional design for argumentative writing for university learners in Pakistan may have numerous positive effects on advancement in argumentation and visual inclusion in an academic writing course, based on statistical findings that indicated a statistically significant difference in argumentation and visuals in their DMC blogposts between the pre-test and each of the two post-tests. The overarching themes that emerged from the qualitative DMC data are resources that contributed to the augmented meaning of an academic argument, challenges, success, and awareness toward using appropriate genres using Toulmin's Model of argumentation (1958). Similarly, writing instructors' data revealed the urge to include digital multimodal composition in ESL academic writing courses and offered ways to assess and emphasise the importance of professional training programs. Lastly, the writing instructors' perspectives were reported, and emergent themes were discussed. The section of the thesis examines the content, structural features, and role of an argumentative academic blogpost within its genre, harnessing the model as a framework. The analysis begins with text-flow, a semiotic mode that realises every genre stage. Text-flow provides rhetorical strategies for employing argumentative structure elements such as claim, backing, warrants, rebuttal, qualifiers, and grounds in these academic blogposts. Each blogpost adopts a unique text-flow configuration captured within the rhetorical and layout layers. Visual elements, such as images,

graphs, and illustrations, contribute structurally to these arguments, often aligning with the rhetorical purpose to complement the text. However, in some cases, image and text do not harmonise in appearance or function. Nevertheless, text-image complexes contribute to the hierarchical layout, helping to prove connections between visual and rhetorical arguments alongside linguistic content.

Elements like paragraphs, headings, titles, and subheadings contribute to the navigation structure, functioning as implicit pointers and entry points. These pointers and entries rely on visual similarity, typically involving shape and colour. The page-flow analysis addresses these blogposts' multimodal structures from the perspective of semiotic modes. Finding the active semiotic mode on a page requires understanding the layout and rhetorical layers rather than relying on visuality or superficial characteristics, as guided by the GeM framework. The approach provides a more robust, structure-based basis for naming active semiotic modes.

The analysis reveals structural differences between page-flow and text-flow. Page-flow shows a linear, easily navigable layout with deeper hierarchical organisation, functionally motivated by Toulmin's Model to address issues in these blogposts. The interpretation of page-flow is approached through discourse semantics, positing that while semiotic modes are abstract concepts, they capture the underlying principles of different modes. A detailed analysis aimed to uncover the thesis's contribution to understanding semiotic modes. Finally, the distribution of these semiotic modes in learners' Digital Multimodal Compositions (DMCs) was examined, examining how technology and digital rhetoric have influenced the deployment of these semiotic modes.

CHAPTER V. FINDINGS AND DISCUSSION

Introduction to the Chapter

The chapter summarised the most significant findings that emerged from the analysis and interpretation of the data. The conclusions were primarily discussed in terms of their relevance to the research hypotheses. In the chapter, the contributions of the thesis were discussed and outlined, together with the implications for teaching and learning for future studies. The research explored digital multimodal composition as an intervention through the formative experiment in an academic writing class in an ESL context. The findings suggested being mindful to illustrate and illuminate connections, making learners aware of their modes and choices while writing, and how different modes work and interact together. As Dewey (1934) suggested, learning value is not inherent but arises from engaging with concrete experiences.

The study comprised 40 learners enrolled at their undergraduate level, including writing instructors and writing coordinators. The writing coordinators were taken on board while designing the intervention, facilitating how the intervention needed to be designed and administered. The learners' generated DMCs were produced as a part of the intervention following Hyland's genre pedagogy. Later, these learners were interviewed on their DMCs as a focus group as part of developing and evaluating their DMCs. Learner participant interviews were open-ended, and discussions around *'looking closely'* (Hicks, 2018) at what learners produced. Writing instructors' interviews were also conducted to gauge their perceptions and beliefs on including and evaluating digital multimodal composition as a part of academic writing. The analysis was performed using constant comparative analysis (Corbin & Strauss, 2015), which allowed the development of initial codes for the study. These codes were drawn from the learners' artefacts, writing instructors, and learners'

interviews. The extensive coding cycle of developing a codebook using NVivo software involved separate themes on learners' DMC artefacts and interviews covering aspects of challenges and successes to document what they have gone through to produce DMC (Saldaña, 2013). These learners' artefacts have been evaluated using the rubric, i.e., visual, while documenting the DMC processes of learners. These learners produced argumentative writing blogposts on Google Sites following Toulmin's Model of Argumentation (1958). Furthermore, writing instructors' interviews were coded using emergent themes of inclusion and assessment of DMC. They further elaborated on the digital aspects of their learners' interests and their value in a DMC artefact.

In the previous chapter, the learners' DMC analysis that they employed allowed for decoding their DMCs while processing genre-based instructions in an academic writing course at the undergraduate level, what resources they delved into during their composing process, and how far they made informed choices. The learners' DMC covered various national and global issues, followed by focus group interviews. Primarily, the study looked at the resources that learners in the ESL context brought to DMC artefacts and how writing instructors and researchers might influence assets for inclusion and evaluation without compromising on the quality, relevance, and rigorous academic curricula. The findings revealed that the inclusion of DMC into the mainstream educational curriculum has been made possible with the application of genre-based writing instructional invention that allowed learners to practice an academic genre at principled four stages of building the ESL context: establishing context, modelling, collaborative construction, and independent construction. These findings indicated that including DMC in ESL academic writing and assessment of DMC developed as part of the composition process and scaffolded

the learning process, curriculum objectives, formative assessment practices, and learning outcomes.

Key Findings

Inclusion and Evaluation of DMC in ESL

The research followed the footsteps of many other scholars who investigated the digital affordances in writing classes and explored the possibilities of employing social media as a resource in different contexts (such as Cochrane & Bateman, 2010; Dickinson & Werner, 2015; Manca & Ranieri, 2016; Pantaleo, 2019; Stewart, 2015, 2023; Stornaiuolo, 2017), the present study examined how learners used Google Sites platform produced digital multimodal arguments through a formative experiment. Findings indicated that learners used the platform multimodally to highlight their digital multimodal compositions and constructed their digital arguments using Toulmin's Model of Argumentation (1958). This directly supports the principles of SDG-4, which advocates for inclusive and equitable education by accommodating diverse learner needs. A more profound knowledge of the ramifications of learners' use of digital platforms helped instructors and researchers to incorporate digital media into the classroom more effectively and improve learners' literacy habits (Mills, 2010), which many scholars contend is still developing but is necessary (Stornaiuolo, 2017). The research suggested an ever-increasing need for multimodality in the ESL academic writing curriculum, which has helped them establish their argumentative writing skills using various available resources. However, classroom-based instructions based on Hyland's genre pedagogy and evaluation procedures using rubrics largely depended upon the learning context, considering theoretical reflections of how multimodality might be incorporated within the ESL classroom.

The findings of the study have been aligned with the views of other scholars regarding the use of multimodal design, reflection, and customisation in the classroom to alter the formal, text-based literacy practices in the ESL setting, as these researchers have investigated in various contexts. (Adami, 2011; Anderson, 2017; Deng & Yuen, 2011; Dyson, 2013; Mills & Exley, 2014; Shanahan, 2013; Vasudevan *et al.*, 2010). My research examined how learners in an ESL writing class expressed their ideas using the Google Sites platform. Multimodal authorship necessitated being aware of the various ways in which modes intersected to produce novel meaning (Jewitt, 2005; Kress & Leeuwen, 2006); instructors and learners were focused on how modes interacted in making meaning of lieu, only looking at what was commonly the case with multimodal initiatives (Shanahan, 2013). The discussion might have challenged writing instructors since multimodal texts did not make the same assumptions as planned and focused linguistically (Jewitt, 2005; Shanahan, 2013). As the research divulged, educators and learners shared ideas creatively by examining how different modes interacted.

Many academics proposed that using a metalanguage in which the metafunctions reported were applied to interact with multimodal texts critically was one way to assist learners and educators in understanding the interaction of modes (Huang & Archer, 2017; Mills, 2010; New London Group, 2010; Unsworth, 2006). Understanding these metafunctions to discuss texts was necessary for learners together with educators because cultivating metatextual awareness required an awareness of the complexity, interdependence, and relationships between words and images (McVee *et al.*, 2018; Shanahan, 2013). Understanding how modes worked together to generate new and reinforced meaning beyond what the modes managed to accomplish single-headedly helped engender fruitful compositions (Huang, 2015). I

argued that, in addition, learners have had a place to create and display their work for an audience outside of the classroom. Many previous studies contended that by choosing the included works, learners curated and engaged with an audience through digital blog entries (Bryant *et al*., 2011). The process is identical to how an artist produces a piece of art to display their work and would have been publicly shared; learners also used digital blogposts to exhibit their work as artists in the context (Guo *et al*., 2009). The study's participants carefully picked pieces of information to construct their arguments to highlight in their blogposts, ensuring that their posts resonated with readers who were not alike in the classroom setting but beyond the academic context. Digital media's publishing capabilities allowed for a larger, interactive audience (Hughes & Morrison, 2018; Magrino & Sorrell, 2014; Robbins & Singer, 2014). Thus, one of the fundamental tenets of multimodality was that learners qualified through the research to curate these blogposts, which could have been accessed through social media by a larger audience (realised or perceived) than only the instructor and fellow learners.

Furthermore, the learners in the study used Google Sites to construct academic arguments. Blogs allow users to share ideas about their connections and experiences spontaneously because they are not judged during their creation but rather holistically after completing the task (Deng & Yuen, 2011). The consideration authorised learners to improve their comprehensive concepts, strengthen links to genre-based class activities (Deng & Yuen, 2011), and create a connection between learners and instructors. Therefore, in the interest of helping learners get ready for multimodal composition, it was revealed that the instructors should have developed a basic understanding of digital media design among learners before and during such an intervention. Many educators received training on using digital devices in the

classroom, but the emphasis should have been more on the procedures than the outcomes (Miller, 2007; Shanahan, 2013). The research's findings on inclusion showed that digital multimodal composition offered striking elements of discussion on affordances of genre and practice in the ESL context, which aligned with a previous study conducted by Huang (2015) in the South African context. The idea that writing was unaffected by the material instruments and semiotic resources accessible for writing production with digital technology was maintained by the form of instruction (Shanahan, 2013). Digital technologies converged on the platform and the pedagogical practices that could have been implemented with that instrument, slightly as they were accomplished during the study (Bazalgette & Buckingham, 2013).

When learners and educators realised the value of the possible practices associated with any platform, its use gained meaning, and it might have been explored for possible affordance in the ESL context. Preferably, the main points of emphasis are the reason for using the platform, its application, and, later, its creations. A growing number of multiliteracies academics were working to replace print-based, traditional, formal texts in school literacy practices with more inclusive, flexible, multimodal modes of communication (Cope & Kalantzis, 2000; Mills, 2010); examples such as the study contributed to the understanding of how social media could have been utilised in the classroom to enhance literacy abilities and multimodality in ways that have not been possible with more traditional writing styles, such as those employed in the ESL context.

There has been an affordance for including and evaluating digital multimodal compositions in ESL contexts, such as supported by language learning (Tseng & Liou, 2006) and broadening communication skills in the ESL context (Yi *et al*., 2020). These affordances also challenge addressing specific technical issues that raise

the concern of using which mode for which purposes and how to assess it (Smith, 2017). The current research offered implications for shifting from traditional writing and scaffolding the writing process through multimodal ways of learning (Zhang, 2021). These affordances and challenges for including digital multimodal composition will be discussed in greater detail, considering genre-based instructions covering the complex issue in the light of the research's findings covering perspectives from learners and instructors, advocating for optimising the learning opportunities and possibilities for the ESL learners in the next section.

Genre-Based Writing Instructions: Opportunities to Develop Multimodal Competency

The DMC intervention significantly contributed to the learning outcomes that supported the inclusion of DMC into the mainstream academic writing course in the ESL context and the belief that the learners were technically advanced and had the potential to produce significant results if technology was integrated into their writing process to make the activity multimodal using social semiotic mode (Jewitt & Kress, 2010). The findings of the research were aligned with those of previous studies that advocated for the importance of genre-based instructions, which yielded positive results in the process of composition. Such interventions have been planned and practised following the belief that instructors and educators utilise their resources, ranging from knowledge to experience, planning to practice, while chaperoning them as such interventions have been created by repeated usage or, as the expression goes, '*we make the road by walking*' (Freire & Horton, 1990). The world has moved on and away from standardised tests and curricula and is prone toward flexible approaches and innovative practices, as that is the only gear toward wayfinding in the technology-oriented era. The research advanced and strengthened the inclusion and evaluation

assumption through genre-based instructions within the digital multimodal composition scholarship field and offered implications for further study.

Hyland's (2003) Genre-based instructions have been pivotal because instructors have the ability to better support learners in making deliberate decisions and improving their ability to identify the most appropriate visual resources to fulfil various rhetorical objectives at different learning stages. Learning requires immersion, considering the ESL context challenged by genre-based education to enhance learning experiences (New London Group, 1996). These instructions have been conducive to the learning environments and strongly emphasised social learning. These teaching strategies contributed to a greater understanding of how ESL learners read and produce multimodal and visual texts. Learners used various resources when writing, demonstrating that they were drawing on their experience and past knowledge, even when they were not being persistent or, at the absolute least, methodically explicit about their decisions. The process raises their awareness of how digital multimodal texts differ from print-based texts (Turner & Hicks, 2017). For instance, the affordances of Google Sites let the reader navigate forward and backward in the digital argument that learners illustrated and posted (Hiippala, 2012, 2017).

As discussed, genre-based instruction was a way to make learners write better in an ESL context (Ajmal & Irfan, 2020; Asghar & Janjua, 2020). Many scholars have validated in their findings that genre-based instructions have a positive impact on the writing ability of learners (Acar, 2023; Astuti *et al*., 2022; Huang & Jun Zhang, 2020; Wardani *et al*., 2021). The study also witnessed an improvement in the textual arguments of the learners before and after the intervention. These findings align with scholars who studied genre-based instruction in classroom-based research, which helped improve their learners' writing skills. Learners' writing skills have not

supported traditional approaches to writing in terms of their writing structures. The study showed that the learners had been engaged in various aspects of composing, and genre-based instructions supported these innovative ways of teaching writing through an eclectic approach in an ESL context. Many researchers have applied genre-based instruction in various settings, such as Agesta (2016), Belmekki & Sekkal (2018), and Tuyen *et al*. (2016), and their findings reaffirmed the positive impact of genre-based instruction. Contrariwise, DMC has been evaluated in the present study, which invoked other researchers and practitioners to ponder its applicability to the ESL context. One key factor in the instructional cycle was that it allowed learners to write and reflect at each stage of their learning. Previous studies have testified that genre-based instructional techniques have helped improve learners' writing skills compared to traditional instruction. To create personal, complex, multimodal compositions that would have been unfeasible in the class, which traditionally focused on formal, language-centred, print-based literary analysis. I looked at how a class of 40 learners created digital blogposts. I looked more closely at the blogposts designs of learners, which showed robust effects and individual interests. Because the unit was open-ended, learners could have used the design of their blogposts entries to incorporate personal interests or engage the audience through various modes of interactions, resulting in compositions beyond the sum of their parts (Kress, 2003). Before and after the invention, their quantitative and qualitative results significantly improved learners' construction of arguments, claims, elaboration, evidence, and rebuttals in ESL academic writing classes, which is one of the critical findings of the research.

It was also important to reflect that learners traversed the rhetorical canons in several ways throughout the intervention process at each stage. During the invention stage, learners were free to choose how to approach the task, allowing them to see the

creative process in action and be prepared to put ideas into practice. Intending to generate ideas, learners drew on various digital resources from various discourse groups, affinities, and strengths. Possibility and intuition throughout the composition process (Krause, 2004) played a crucial role in selecting a theme and other aspects, including arrangement and final layout and design of their blogposts. The research also delved into how learners expanded on the conventions they introduced to argumentative composition, demonstrating their learning style. Delivery, the canon, entered its preliminary stages of innovation and concentrated on communicating the message, in the case of digital argumentative writing. The system they employed, i.e., Google Sites, became instrumental in invention, design, and style. Impromptu events and the unconscious usage of resources inspired the technique.

With the help of Hyland's genre-pedagogy instructions, the study contributed to the theoretical perspective of academic writing and, in a specific argument as a genre, as inspired by Swales' notion of genre (1990) and multimodal social semiotics, the research argued that the rhetoric's interest that was on resources from social and cultural context shaped an argument. Such a view on argument accepted that an argument was constructed to convey meaning and specific information concerning space and time, and was always *'newly made.'* The study contended that an argument was a form of cultural and textual expression with a particular pattern, following Kress (1989). Though in the study, the learners constructed their multimodal arguments from the perspective that an academic argument was viewed as a connection to genre, mode, medium, and discourse, social categories that helped shape an argument. Genre-based instruction allowed these digital affordances of an argument to integrate within an academic writing community and the ESL context. The analysis of the Google Sites in previous chapters highlighted the affordances of

the method of comprehending arguments in the academic ESL context. The digital affordances related to argument construction are essential to discuss in the next part.

Genre and Argument

Arguments in the humanities have been seen as a fixed notion of what an academic argument ought to be and what it should look like, such as in an academic essay. Similarly, writing instructors have been valuing writing as a competent skill to survive in academics for ages, and that is what learners have been expected to produce and learn in a traditional writing class. The learners struggled to construct an argument in an academic writing class through blogposts arising from their diverse opinions on the scholarly argument as it appeared in the essay. A literary discussion would have been based on facts and engaged in serious debate from their point of view. Such cases were consistent with previous research showing that specific genres were more favoured for producing knowledge than others. (Huang & Archer, 2017). This allowed learners to identify and critically examine the functions and applications of genres by enabling them to experiment with an argumentative genre for expressing academic arguments across digital media. It provided many methods of instruction and learning in the ESL context, as in the current study. Working with disciplinary resources in novel ways could have improved disciplinary understanding and its epistemological relevance, as English (2011) suggested.

Genre directed learners toward semiotic and thematic resources, apart from helping them shape and construct knowledge in specific ways (English, 2011). The research employed Google Sites as a digital resource and affordance that allowed learners to create their digital multimodal arguments in a way that otherwise would not have been possible. Pictures, graphics, visuals, themes, and colours strengthened their positionality as rhetors and helped them occupy and establish their niche on the

selected topics. Furthermore, how they arranged their arguments in digital spaces inferred how well they wanted to present their arguments as nonlinear and multimodal to academic audiences, as the multimodal data highlighted. Their disposition toward displays added meaning to their blogposts' compositional, interpersonal, and ideational meanings. Because of this tendency, the learners concentrated more on using visual aids for reasoning than physical ones, such as gestures and posture. From this angle, multimodal genres offered the opportunity to experiment with rhetorical devices and present parts of an argument typically not explored in traditional writing. Thematic and semiotic orientations of different genres offer different methods to play with and convey academic arguments, which could have stimulated new ways of conceptualising and interacting with academic arguments in the ESL context.

Though I supported a multimodal strategy for scholarly argument in the research, it did not undermine the importance of the practice of writing. Because of its unique advantages, the essay was a suitable genre for assessment in academic ESL. The essay was especially well-suited to function as a draft for a multimodal endeavour because of its ability to organise ideas and arguments. The research argued that the process of '*regenerating*' (English, 2011) writing a piece of composition in a multimodal format offered a platform to talk about the parallels and divergences between ordinary and disciplinary activities, in addition to serving as a tool to assist learners in structuring their ideas and arguments logically and coherently. Connecting discipline and everyday knowledge, transferring knowledge from academics to everyday life.

Toulmin's Model of Argumentation and DMC

Toulmin (1958) provided an opportunity and a scaffold for structuring an argument for the learners in an ESL context while integrating DMC in academic writing, as the

study proposed. The quantitative findings indicated that the learners improved their arguments after the intervention. However, qualitative findings showed that not all components were to be covered or identified. Learners' pre- and post-tests indicated that their writing and composing abilities aligned with what the rubric followed. Contrariwise, their focus group interviews and DMC blogposts stated that they found this model complex enough to apply. They found it challenging to find relevant illustrations and literature within their topics to cover all aspects of the argumentative model. All, prior to the intervention, learners were not sure whether the multimodal composition was made possible by what the New London Group (1996) referred to as the *'Available Design'* (p. 75) or the resources that were accessible, yet, using the argumentation paradigm in their DMC enabled digital multimodal composition in the setting of ESL. Preferably, prior to the intervention, learners believed the argument could only be made in written language. Following the intervention, learners in undergraduate situations demonstrated a greater understanding that arguments might have employed more than marginally written words.

The learners' digital multimodal composition improved significantly, enhancing their knowledge of the elements of argumentative writing and helping them scaffold their ability to organise such aspects, which they believed would transfer to their writing of conventional arguments, according to the qualitative data in both cases in the study. However, the quantitative data did not support these findings. According to statistical results, there was a statistically significant difference in argumentation between the pre-test and post-tests. This suggested that the genre-based instructional design for argumentative writing developed for Pakistani university learners positively impacts their argumentation skills. This claim, therefore, implied that the intervention successfully taught learners the components of an argument and

that an argument's multimodal design would yield positive results. Contrariwise, the study aimed to enhance learners' digital multimodal compositions and those that adhered to Toulmin's paradigm by having them develop digital multimodal arguments as part of an intervention. Instructors may have more tremendous success teaching only about conventional argumentative writing if they had concentrated on strengthening conventional arguments. However, as mentioned in the previous claim, learners' engagement with multimodal composition needs to be balanced with traditional writing instruction. The study showed that teaching conventional argument writing, which would have required more explicit instruction to boost gains in the quantitative data, together with multimodal argument writing, encouraged learners to interact with the argument and learn the elements of argumentative writing and its multimodal design.

The research recognised the multimodal approach to constructing academic writing while emphasising digital affordances of genre, modes, and media, with a view that learners noticed the two fundamental components of argumentation claims and evidence together with their succinctly structured form. Consequently, the participants thought the Toulmin Model was novel. More crucially, for comprehending the structure of argumentative conversations in written speech, learners in the study frequently believed that the model was preferably sophisticated, thorough, systematic, and procedural. Although the model's restricted use as a scoring rubric has drawn criticism (Carlsen & Hall, 1997; Chinn & Anderson, 1998; Jimenez-Aleixandre & Bugallo-Rodríguez, 1997). The study offered a broader interpretation of the model as a collection of norms for critical evaluation that assisted learners in assessing the coherence of an argument in both their writing and reading (Andrews, 2009; Lunsford, 2002) while completing the final written product. The process-based

diagram with categorical elements was thought to help grasp the order of an argument and study the argument structure, reminding learners of the terminology and concepts of the model, even though many of the study's participants regarded the Toulmin Model as mentally taxing (Williams, 2015 & 2016).

According to the study, the model for writing education had advantages and disadvantages. Therefore, we needed to carefully consider how to implement it in real writing classrooms for ESL learners. The collective feedback from the learners in the study indicated that specific categorical elements and the procedural organisation of the model enhanced their awareness of logical cohesion and coherence while writing an essay. This has been noted even though the model primarily addresses paragraph-level arguments rather than complete essay-level argumentation (Williams, 2015). This suggests that the study may not fall under the criticism that the model solely promotes a particular argument structure (Williams, 2015). Rather, Toulmin's clear argument unit would aid learners in applying its framework when composing each justification paragraph in their essays.

Furthermore, the Toulmin Model was thought to help learners develop a greater awareness of the structure of argumentative writing and sensitivity to the critical cohesiveness of an argument because it offered a more intricate structure than most of the study's participants were accustomed to. The qualitative results from the learner data indicated that, after learning about the model's components during the orientation stage, the participants intentionally attempted to use them in the step-by-step process and employed more argumentation-specific elements in their writings. As a result, the model's complex and organised framework improved learners' comprehension of critical reasoning, which in turn helped them write more effective, detailed argumentative blogposts.

Meanwhile, the study's overall findings showed that the learners were unclear about the difference between warrant and ground, which was inconsistent with statements made in the literature that warrant is the most challenging component of the model (Williams, 2015; Lunsford, 2002). In addition to the subtle distinctions between Toulmin's elements, learners might have been more confused about some model components if they had not had the chance to study a particular argument structure or subdivided argument elements. The lecturers and e-developers also reported the possibility of confusion among the model's elements. Thus, the finding corroborated the literature's recommendation that educators carefully needed to analyse how to modify the original model for a particular learning environment (Williams, 2015, 2016; Lunsford, 2002; Qin & Karabacak, 2010; Simon, 2008), indicating that the Toulmin Model's components needed to be categorically merged or made simpler for ESL learners. Even though specific components in the model were complicated for the learners to distinguish, overly simplistic reasoning categories should have been given careful thought. The model's feature of sub-specialised components convergent to a claim in the argumentation framework might have improved sensitivity and a palpable sense of logical coherence by adhering to its structural sequence. Even if some of the aspects could be confusing, learners should be able to understand the relationships between the model's elements because each element methodically supports a stated claim. Thus, the true qualities or advantages that the model offered might have been eliminated by hazy boundaries between the elements that fell under a broad category of evidence, potentially diminishing the model's significance. The study's qualitative results showed that learners and instructors responded favourably to the Toulmin Model's schematisation of its specific components, which enhanced their impression of the model.

Instructors should have appropriately introduced and explained the argumentation model to learners despite little emphasis on its practical applications (Qin & Karabacak, 2010). To improve comprehension, educators could introduce the three primary components: claim, grounds, and warrant before moving on to the supporting, rebuttal, and qualifier parts (Qin & Karabacak, 2010). Alternatively, closely related parts, such as warrants and grounds, which learners found to be the most puzzling, could be combined into a single category and taught as a single, extensive backing procedure, depending on the writing proficiency of the learners (Simon, 2008). Learners' cognitive load could have been reduced by simplifying the Toulmin Model's intricate details into one more manageable category. The qualitative data indicated that learners required adequate time to become familiar with the model's parts and the enhanced practice of harnessing the model's fundamental components and adjusting the model. Previous research has shown that learners are included in the process of reclassifying the argumentation parts and that instructors and learners should work together to construct specific writing rubrics during the time (Evans, 2013; Stevens & Levi, 2005; Wang & Zhang, 2021).

Furthermore, we must think about and investigate potential modifications to the structured model of argumentation that could expand its application for the development of argumentation beyond the narrow confines of conventional instruction that emphasises linguistic competence and mechanical skills together with genre-specific knowledge, which is covered explicitly in English for Specific Purpose (ESP). Argumentative writing goes beyond patterned essays with argumentation components, according to Stapleton and Wu (2015). The study's findings inferred that the calibre of reasoning should be firmly established and go beyond the apparent degree of logicality. It implies that knowledge of genres, language proficiency, or

technical proficiency cannot be used to represent or confuse argumentation skills. The point emphasises how important it is for learners to structure an argument for logical discussions, as it has frequently been overlooked or lacking in English writing instruction on arguments. In contrast, linguistic proficiency and genre-specific knowledge typically receive much attention.

Therefore, in place of approximately using the rubrics based on the model to measure learners' improvement in argumentation, greater emphasis should be placed on researching how to teach or apply the Toulmin Model across various levels of writing proficiency, as well as in different writing contexts that depend on specific conventions of the First Language (L1). The focus aims to address the challenges and potential variables involved in instruction on argumentation. Simultaneously, it is imperative to investigate the creation of pertinent educational resources that may highlight and demonstrate a modified logical framework and specific elements of the model. This foregrounding calls for relevant research on the outcomes of the produced materials.

Examining learners' argumentation abilities from an unfamiliar perspective, the order of knowledge growth can also be explored. The most advanced degree of linguistic proficiency is awareness of argumentation, which is why it should last in the developmental order of writing skills. Argumentation skills are neither naturally transferable from language and genre-specific knowledge nor interchangeable with it, since the progression order suggests a hierarchy of writing proficiency growth. The point highlights the importance of providing focused training on argumentation, which can never be undervalued or overlooked while teaching writing. In addition, the need for argumentation-focused instruction indicates that, instead of depending solely on conventional teaching methods in ESP writing courses, more argumentation-

specific instructional materials should be created and put into use to improve understanding of argument structure and essential strategies. Because certain aspects of the model are hard to distinguish, the Toulmin Model is technically challenging to comprehend and use, and writing instructors should be able to create more strategy-focused teaching resources using research findings (Andrews, 2009).

Conceptualising Argument Through Modes

The argument is assumed to be non-specific to any one mode under a multimodal social semiotic approach. The point of view focuses on the function of modes in forming an argument in place of the arguments around the admissibility of nonverbal resources as argumentative resources. This method of approaching arguments is helpful because it draws attention to the advantages of a particular mode for achieving a specific goal in an argument. Google Sites has shown that the visual form may effectively explain the position statement, make claims, create graphics through direct quotations, and offer proof to support those statements. It was discovered that although written communication works well for conveying abstract or conceptual ideas, visual communication can also establish authority with visual signifiers, establish credibility by providing evidence in the form of screenshots, and even help establish affinity by fostering an environment that the audience can relate to visually. These interactive websites in an academic ESL setting suggested that the visual mode could serve as a connecting element, making it appropriate for expressing logical relationships. Upon realising that the argument is not mode-specific, ideas for the most effective modes for achieving various aspects of the argument arise. Implementing specific modes' affordances to conduct portions of an argument is feasible. I contend that teaching learners about modes and their affordances for

generating arguments can better equip them to engage in argumentation in the modern world.

Robust and efficient communication can be achieved in design by layering and paying attention to the interaction of modalities (Kress & Leeuwen, 1996). When modes are used in isolated, focused ways, their usefulness for communication diminishes because one mode takes precedence over another (Shanahan, 2013). The academic writing class concentrated on linguistically dominant modes for meaning-making before beginning the blogposts unit. Thus, in doing so, learners were limited to using only particular techniques and formats to express thoughts in the ESL contexts where essay-based forms of writing were more privileged than others. However, the learners excelled when given the freedom to create in several modes. Learners wrote about themselves to express themselves through an expanded array of design choices afforded by multimodal platforms, i.e., Google Sites: this shift in design and meaning-making profoundly affected how instructors approached writing in their ESL context.

In the early phases of the genre-pedagogy instructional process, learners stated how graphics and visuals helped them conceptualise different social and cultural topics. Meaning-making with non-linguistic modes often occurred prior to learners' written notes or other textual elements of their DMC projects, providing them with a thematic foundation for their analyses. Learners collaborated to develop the analytical framework for their DMC projects through visual conceptualisation. The process involved using abstract concepts (such as 'culture' and 'identity') to search for images online. Subsequently, learners engaged in visual brainstorming by examining and evaluating several photographs from their searches. These images sparked discussions and connections to the themes in the texts they were studying. Many learners noted

using visuals as a starting point for their literary evaluations. Several learners used music or films to help them multimodally visualise ideas before they even started writing.

Additionally, by conceptualising in both visual and aural modalities, learners could '*see*' the content, which aided in developing a sensory comprehension of the book. Several learners' replies repeated this pattern of using multimodal composition to '*visualise*' text. Learners explained that interacting with the material in various forms compelled them to think creatively and adopt a less literal approach in their initial readings.

Medium and Argument

The medium makes modes and semiotic resources tangible as a distribution and production tool. Giving learners access to Google Sites allowed them to practice using different resources to build arguments. The study demonstrated how specific modes can facilitate and impede the use of semiotic resources in constructing arguments. The blogposts, for example, explain how learners can engage with photos, still images, written text, multimodal orchestration, interactivity, and editing devices when they use digital text as a production tool. It allows one to think of edits as framing methods, photos as resources for pathos, and screenshots as resources for ethos. Digital blog entries serve as a distribution mechanism that allows the argument to be spread on social media sites such as Facebook and Twitter. As previously indicated, the media's characteristics also significantly influence the arrangement of material in an argument. These blog entries make it possible to think about interactivity and multimodal orchestration as tools at one's disposal for argument construction. As a production and distribution tool, the medium may put the user in a position to employ specific resources to create meaning. However, it is pivotal to understand how it is

utilised and that the resources accessed depend on the user, not the technology. Encouraging learners to do distinct aspects and get acquainted with a medium's digital features can make them think about which medium would be ideal for presenting ideas at various times.

Orchestration of Multimodal Artefact in ESL Context

Material substrate plays a significant role in the production and consumption processes shaping the structure of digital multimodal artefacts, having academic arguments (Kress & Leeuwen 2001; Bateman 2008; Hiippalla 2014); the choices made during the process contribute significantly to the way different modes, such as textual and visual, interact and communicate within the digital multimodal composition. The structure of the multimodal artefact starts with the medium, taking it to the arena of visual rhetoric in which it explores the resources, processes, and awareness that played a significant role in constructing an academic argument and how it influenced the choices learners made.

The analysis of multimodal structure offered a way to identify the active semiotic modes from text-flow informed by Toulmin's Model of argumentation in the content and context of ESL academic writing. It highlights the cross-layered analysis using the GeM framework to study the patterns across learners' generated DMC blogposts. The patterns that have been observed in the manually annotated dataset have been functionally motivated (Bateman and Schmidt 2012; Waller *et al*. 2012, Hiippala 2015); it was found that the model effectively provides a hierarchical structure of the content in the text-flow to page-flow and finally image-flow, to realise the genre of a multimodal blogpost. The analysis highlights a range of graphical representations that enabled the multimodal orchestration, integrating textual and visual components of the multimodal academic blogposts' multimodal structure.

The multimodal structure serves as the framework of the genre, which is subsequently elaborated upon by the content. Together, they shape the reader's expectations regarding the multimodal artefact. The multimodal structure forms the framework of the genre, with the content filling it in to shape the academic digital argument with a scholarly audience in mind. Finally, the research enabled us to link the patterns observed in the data to the underlying structural principles (Holsanova and Nord, 2010), framing them through semiotic modes (Bateman, 2011). Although semiotic modes are high-level abstractions, these blogposts generated by learners helped bridge these theoretical modes with the concrete multimodal structures observed. In these artefacts, text-flow was primarily used to provide detailed descriptions, while page-flow segmented these descriptions into more digestible sections. In contrast, the image-flow helped stage, integrate, and strengthen these academic arguments visually and textually in an ESL context. The organization of multimodal artefacts followed identifiable patterns concordant with the GeM framework. Learners developed an emerging awareness of rhetorical layering while incorporating the use of titles and navigation bars to establish claims and visual elements to posit warrants or counterarguments. This structural intentionality enhanced peer recognition as well as instructor judgment of argumentative coherence.

Improvement in Learners' Argumentative Skills Through DMC

The quantitative evidence of the study reveals that in the ESL context, DMC-based intervention proved to be effective in developing learners' writing abilities and demonstrating significant improvement in their final blogposts. Although the learners could not fully apply Toulmin's model of argumentation in their academic arguments, it was found that before and after the intervention, the learners demonstrated an interest and personal inclination to learn, which produced DMC in their preferred

subjects. When the learners' generated DMC was analysed using the multimodal social semiotic framework, they created exciting ways of presenting their digital arguments that otherwise would not have been possible. A statistically significant difference between pre- and post-tests was detected in their writing (Cho & Kim, 2021; Kim & Belcher, 2020). These findings align with other research that indicates that the DMC strikes learners' interests if they can excel, explore, collaborate, and reflect on their choices. This suggests that the ESL learners were not competent before the intervention with multimodal meaning representation and visual design; despite everything, after the intervention, it helped them build competency in their writing ability and visuals to construct digital multimodal composition.

Subsequent research endeavours may continue exploring the attributes of both individual and collaborative DMC in diverse ESL learning environments. The process of analysing and rating DMC items is remarkably crucial. The most current genre-based paradigm, which includes rhetoric, basic units, layout, navigation, and purpose (Jiang *et al*., 2022), could aid in our evaluation of DMC products. Additionally, harnessing genre expertise, a fresh linguistic and visual analysis (D'Angelo, 2016) could be applied to analyse how individual and group DMC interactions occur between ESL learners, the audience, and the topic. Our comprehension of the metadiscourse realised in digital multimodal compositions (such as interactive and interactional features will be improved as a result (Hyland & Tse, 2004).

Art to Design: Haggling with Semiotic Resources

Hull and Nelson (2005) claim that multimodality provides a new way of approaching meaning-making with a unique meaning (Hull & Nelson, 2005). After learning how multimodal texts are constructed, my learners applied their newly acquired understanding of design principles to produce unique, parodied weblogs. Giving

learners a voice as authors is the most efficient method to change their power

dynamics (Bourke *et al*., 2013). While English studies learners are often provided

with the tools to analyse and discuss literature, they are not usually allowed to break

down and reconstruct literary works. By creating texts, learners learn how to craft

messages or meaning for a readership and transform from consumers into meaning-

makers. To produce these texts, my learners must understand how to use semiotic

instruments to create meaning (Albers & Harste, 2007). Most research showed how

effectively learners navigate semiotic resources and modes when writing texts (Hull

& Nelson, 2005; Steeves, 2015). When building their projects, learners had to choose

which modes would function best in each ESL context, such as using conversation,

sound effects, and gestures to convey the character's thoughts and emotions

effectively. Learners were encouraged to become more conscious of design choices

and decision-making through this transmediation process (Pantaleo, 2019) and to

view the narrative differently, leading to a more intricate final product. It is crucial to

remember that the instructor must permit some leeway in how learners leverage the

storyboard. The storyboard will have a variety of uses since learners work on projects

in a variety of formats. Kress and Leeuwen (2002) noted that neither the rules for

using design tools nor the grammar of visual design are set in stone. Learners are most

effective when allowed to explore and negotiate using semiotic resources (Gilje,

2010).

Expression of Self Using Various Modes

Many learners were able to authentically express their identities by communicating

through a range of modalities. They shared how they connected the ESL material to

their emotions, multicultural experiences, and extracurricular activities. A common

theme among all learners was how they incorporated aspects of their identities

through various modalities. They expressed their individuality and integrated their personal experiences into their DMC projects by selecting sounds and visuals that held personal significance, such as cultural songs, artefacts, traditions, images of food or places, and elements of their linguistic heritage. Learners also noted that including sounds and visuals helped them connect to the ESL material. One learner stated the following.

> *I felt like my creative side was being challenged, and I had to win over that challenge.*

Finally, learners depicted facets of interesting multimodal usage. One of the learners noted:

> *That project woke me up and trembled my soul. While researching and reading about the struggles of children, it made me grateful and sad at the same time. It made me regain my voice so I could become the voice of the unheard child labourers.*

Learners' identity as visual artists gave them the confidence to start and persist through the process. They identified with a writer's identity, saying they were also satisfied with their writing. They also possessed the technical skills to execute their vision. They discussed a digital drawing tool that enabled them to compose and post on Google Sites.

Engagement during DMC Intervention

Learner engagement with argumentation may be enhanced by concentrating on socially relevant projects that promote learner creativity and genuine use of digital, multimodal technologies. Alvermann talked about the idea in institutions that teaching more traditional texts is distracted by digital, multimodal materials (Alvermann, 2011). According to the study, emphasising projects with social relevance that promote learner invention and genuine harnessing of digital and multimodal resources could improve learners' engagement with argument. The digital, multimodal design of the argument and the social features of the learners' arguments' relevance and

authenticity contributed to this engagement. Learners found the intervention appealing because of these features. They could result in what the New London Group (1996) called *transformed practice, or the capacity of learners* to conduct new practices infused with their objectives and values (p. 87). The practice that the study transformed was how learners built multimodal arguments. When writing their DMC blog entries, learners were able to support a social position because of the study's multimodal argument design. Both the examples in the research and the other, smaller-scale investigation demonstrated this engagement.

The undergraduate learners found producing content for their multimodal, digital arguments difficult. Even while evidence indicates that learners who regularly utilise digital tools may find this surprising (Rideout *et al*., 2010), and content creators (Lenhart & Madden, 2005). Considering the traditional academic assignments and the pressure to complete them that the learners in the research encountered, it is unsurprising. According to Lenhart and Madden (2005), learners in suburban and urban settings often had higher percentages of content creators than those in rural areas. Participants in the study attended an urban institution.

Contrariwise, as focused codes that engaged learners, such as using digital tools to enjoy and focus, and as codes that demonstrated how learners became more involved and less disruptive when using digital tools in the computer lab, the intervention reduced disruptive behaviour. They were thrilled with the multimodal digital tools and a sense of personal relevance to the social concerns they wrote about. More research is necessary to understand how this content generation affects learners in different ESL environments. According to Becker (2018) and the New London Group (Bezemer & Kress, 2008; Cope & Kalantzis, 2000; Kress, 2003; Mills, 2015), learners found personally relevant topics exciting and engaging when analysing the

data related to their use of technology to create multimodal projects and pursue rhetorical goals. Because the study's participants had personally meaningful aims and found the design enjoyable, they were invested in conveying their topics. Many learners demonstrated an understanding of the design opportunities presented by digital technology. They stated that they attempted to communicate their ideas to their audience in various ways throughout their initiatives. Learners showed that they had considered the layout of their blog entries for a song's rhetorical analysis. Besides exhibiting a keen understanding of the connections between hue and sentiment, learners endeavoured to depict intricate concepts through symbolic components. The relationship between design, topic, and composer took many exciting shapes, and learners were able to consider and explain how and why they made the decisions they did in their DMC projects.

The research explored how learners from ESL contexts create meaning through various modes using multimodal social semiotics and SFL that reflect the complex relationships of digital multimodal composition and the way learners' preferences of choice of the appropriate mode to communicate (Kress, 2003; Kress, 2009; Unsworth & Mills, 2020; Mills, 2015). Multimodal orchestrating offered them ways to make meaning and connect their composing with their sense of civic engagement through their topics and advocating for diverse issues. It challenges the text-based writing process and curricula and highlights the importance of non-linguistic resources for communication purposes. Such practices invite practitioners to reconsider and redefine the concept of writing and composition in an ESL context that suits the technologically advanced requirements encompassing ESL learners' multimodal practices. The digital multimodal composition has been foregrounded in innovation and enhanced learners' engagement.

Assessment of Multimodal Texts Using Visual Rubric

Research suggests that evaluating multimodal texts can be challenging (Curwood, 2012; Wyatt-Smith & Kimber, 2009). Abandoning the old text-based English assessment methods to assess multimodal materials is necessary. The application of the rubric to evaluate multimodal texts is a topic of significant discussion. Many scholars believe that the rubric is excessively rigid and that the project's aesthetic reaction may be overlooked because it concentrates on identifying particular features within particular categories (Wyatt-Smith & Kimber, 2009). The rigidity of the rubric I made for the multimodal project caused me some trouble, and I had to keep adding to and modifying it to take learner learning into account.

Despite these limitations, the literature appears to agree that rubrics are helpful for formative assessment since they raise learners' knowledge of essential concepts, such as design practices (Hung *et al*., 2013). A large body of research values the learning process more than the final product and favours formative assessment over summative evaluation for learner learning (Bearne, 2009; Graham & Benson, 2010). More discussion is needed regarding generating a mark when summative assessment is necessary, even though I agree that formative assessment is vital for learners' growth. Although the grade or rubric category did not always consider the cognitive processes that were or were not involved in some of the learner projects, I still found the rubric valuable in setting a baseline for evaluation, such as whether the project entirely fulfilled expectations. My literature analysis showed that learners must be able to articulate their ideas in their work to be assessed and to understand the learning taking place. It was identified that had the learners not been allowed to share the ideas behind their creations, they would not have been able to appreciate the intertextual work that included pastiche, parody, and appropriation. The ESL learners

paid attention to the issue of substance and visual representation while using the rubric's criteria as guidelines and concentrating equally on argumentative writing. Although further thorough research investigations on the argumentative DMC are necessary to make valid pedagogical conclusions, the current study sheds light on how Li and Pham implemented genre-based DMC assignments in ESL classrooms. First, a well-developed grading rubric is vital for DMC tasks. The study's participants utilised the rubric during the task implementation process, and several criteria within the rubric provided support for their DMC creation. When combined with the learners' comments, the evidence strongly supported the use of DMC evaluation in the context of ESL instruction. As a result, educators must have the authority to design and implement rubrics for evaluating multimodal projects that demonstrate learners' language and reading proficiency while also conforming to the necessary criteria, as in the case of the present research.

Evaluating how multimodal composition affects the development of language and literacy abilities in ESL learners is a challenging task because media composition is not a discrete text that can be evaluated in isolation. Evaluating multimodal texts differs from evaluating conventional reading and writing abilities. In addition to speaking and writing, other skills required for media creation, such as problem-solving and critical thinking, develop gradually and should be documented to monitor learners' progress. In this context, rather than using summative assessments to evaluate the multimodal project as a final product, instructors and researchers should leverage formative assessments (Pandya, 2012) to gauge the effectiveness of learners' processes in producing multimedia texts. The approach allows for a focus on micro-level production skills, such as understanding the audience, coherence, and cohesion in putting concepts in a scripted form.

The rubric used for the study of argumentative writing was the VG-informed rubric for the digital multimodal aspect, which helped learners understand argumentative writing and visual mechanics during their revision process. From the learners' point of view, the writing rubric was easy to follow; despite everything, the visual rubric was found to be too complex for them to yield to, and it is interesting to note that future studies should be based on taking learners on board to construct a visual rubric based on individualised learning and ESL context. The criteria explained in the rubric, as supported by the previous studies (Stevens & Levi, 2005), allowed them to review and revise their drafts at various stages of genre pedagogy. Such practices have been supported in making learners' focused and self-driven decisions (Black & Wiliam, 1998, 2009). The process primarily encourages learners to revise their drafts and make improvements to their drafts that eventually help them achieve learning objectives to become better authors. The learners reported having problems incorporating all components of argumentation at once when they first drafted their essays. This illustrious finding lends credence to the idea that rubrics eventually motivate learners to assume greater accountability for their actions and learning (Kang, 2021). While not always necessary, the inclusion of all the argumentation components in the first rubric may motivate learners to write more logical and well-structured essays as writers and to review more content-specific, well-organised, and substantial comments as reviewers, thereby improving the calibre of critical thinking as noted by Kuhn (1991).

Additionally, learners' participation in the rubric-development process can strengthen the benefits of the rubric on learners' advancement as writers (Evans, 2013; Stevens & Levi, 2005). Additional research may be necessary to establish a feedback policy and clear rubric criteria tailored to a specific writing classroom and to prepare

learners for collaborative feedback tasks within a particular cultural context. Giving more serious consideration to the fundamental elements of the target instructional environment regarding feedback and rubric is essential.

Constraints with Digital Multimodal Composition

Learners shared their perspectives on multimodal composition's benefits while highlighting their challenges. The most common issue they encountered during the writing process was various technical difficulties (Khalid & Janjua, 2024). Many learners struggled to integrate content, leverage hyperlinks, and work with other editing tools in certain composing software, such as PowerPoint, iMovie, and Audacity. They mentioned that they often needed assistance from their instructor and peers due to these technological challenges. One learner, LL9, noted the following:

> *The Multimodal assignment has been practical but*
> *extremely difficult due to the time limit and lack of the*
> *right skills to conduct the task efficiently.*

The second most common limitation on multimodal composition noted by learners was the challenge of selecting the best way to express their ideas. Other constraints included feelings of having insufficient time to complete their DMC tasks, mainly when they lacked access to a laptop or faced internet connectivity issues. While learners acknowledged the advantages of DMC composition, they also discussed their difficulties. The most prevalent challenges during their writing processes were various technical issues. Many learners reported problems with composing applications and software, often requiring assistance from their instructors and peers to overcome these technological difficulties. Additionally, some learners preferred typing their assignments, as they felt more comfortable with the conventions of traditional academic writing.

The implication of this discovery for instructors' professional development is covered in the following statement. One explanation is that English instructors think their primary focus should be on conventional literacies, and multiliteracies should only be given secondary attention (i.e., only if time, learner ability, and curriculum allow for what could be viewed as a diversion from the main focus). More research, such as this one that focuses on the talent's projects based on the multiliteracies perspective, if any, and if these translate to more traditional literacies, could benefit instructors. As an illustration, the study found that developing multimodal arguments increased learners' understanding of and interaction with the argument (explained in the following claims). Future research findings supporting the beneficial academic effects of multimodal composition might persuade instructors to incorporate multimodality more into their lesson plans. These results might be required to encourage instructors to incorporate multimodality into their lessons, which frequently necessitates teaching new skills, as in these situations, and to allay worries that by doing so, they will overlook conventional literacies, which have historically been the main focus of curricula and standards in schools (Alvermann, 2011). By incorporating multimodal argument projects, instructors in both the smaller-scale study and the two cases voiced concern that they were not paying attention to traditional writing. The study showed that for treatments, including digital, multimodal composition, to be successful, instructors may require additional training. Future studies should examine the elements that instructors need to successfully incorporate multimodality into their lessons and how professional development and instructor training might support these elements.

These restrictions were also made worse because learners produced individually relevant content that they took the trouble to research and effectively

convey. Because their issues were personally meaningful, they might have felt pressured to prioritise thoroughly expressing their ideas over making a shorter or simpler presentation. Put another way, some of the issues that learners described were brought on by the task, both because of program constraints and because learners seemed motivated to perform well despite technical issues.

Instructors' Beliefs on Inclusion and Assessment of DMC

Nevertheless, despite the opportunity for meaning-making through many forms, most learners are firmly inclined to the instructors' interpretation of what constitutes writing within the ESL setting. Even though the instructors offered multimodal and visual assignments in their classes, the more conventional written essays received more weight and attention than the latter. Instructors interviewed for the article did not even touch on the visual elements of Google Sites outside of its design. Preferably, they highlighted the many writing styles seen on each platform while emphasising textual modes. Similar to numerous educators, introducing novel, multimodal, and open-ended assignments into their classroom (VanKooten & Berkley, 2016), ideas, experiences, and prior teaching training of instructors to assist in deciding what to evaluate (Dalton, 2014; Ranker, 2012; Smith, 2017), and hence tend to favour conventional writing styles. If the purpose of education is to prepare learners for their futures, then educators, legislators, and schools need to be aware that learners may be preparing for occupations that are inconceivable to them right now (Leu *et al*., 2018; Moje & Ellison, 2016).

Although instructors' experiences and opinions shape their instruction (Dalton, 2014; Ranker, 2012; Smith, 2017), these opinions might not always align. As stated by DiPardo and Sperling (2008), research has highlighted how instructors must navigate such frequent at-odds influences on their teaching and thinking as high-

stakes assessments of their learners' reading and writing and school-level evaluations of their education. These can lead to varying and sometimes competing conceptions about reading, writing, knowledge, and learning. Moreover, English instructors must navigate the political, historical, intellectual, and institutional demands of the evolving nature of literacies and what that can entail for those in positions of power as they constantly run across and try to rethink the old English education cliché (Sperling & DiPardo, 2008). The instructors in the smaller-scale study praised multiliteracies but were also worried that she would overlook instructional objectives about conventional writing if she included an intervention based on multiliteracies. By participating in the study, these three educators demonstrated their interest in incorporating multiliteracies into their curricula. Contrariwise, in both this and the smaller-scale study, the educators felt uneasy about this commitment when it took away from their belief that they needed to concentrate on conventional literacy. Future studies might focus on whether other educators encounter a similar contradiction when incorporating treatments based on multiliteracies and, if so, how to address it.

These instructors needed more professional development to increase this intervention's efficacy, especially by combining digital technologies with subject-matter expertise. Even though the undergraduate case instructor had graduated from an instructor education program, she struggled with using digital technologies such as Google Docs during her in-services at her institution. It may also be advantageous to support seasoned educators' attempts to incorporate digital technologies into their content area goals, such as teaching argument writing in the study. The result confirms the hypothesis put forth by Reinking and Bradley (2008) that professional development is a standard and significant by-product of formative and design

experimentation. Despite the benefits of multimodal literacy practices in second-language learning environments, educators, researchers, and instructors identify several obstacles to the successful inclusion of multimodal composition into classroom instruction (Sultana & Turner, 2021). Multimodal literacy practices in ESL classrooms are hampered by factors such as traditional school contexts, fixed curricula, high-stakes standardised testing, instructors' and learners' access to digital tools and technological readiness, and instructors' perceptions of language learning, text production, and literacy (Yi *et al*., 2020; Yi & Angay-Crowder, 2016).

New Multimodal Pedagogy Informed by the Genre and Instructors' Readiness

The study highlights the potential benefits of including and integrating digital multimodal composition in an ESL context that illustrates and paves the way for new multimodal pedagogy and translanguaging informed by the genre, benefitting the educational goals and curricula for bilingual and multilingual contexts in diverse ways (Cope & Kalantzis, 2015; Canagarajah, 2023). Such new ways of teaching also offer challenges, including having robust assessment and evaluation methods for multimodal texts and supporting the learning process by making informed decisions toward the appropriate approach and production. However, instructor training has been essential to support multimodal pedagogical instructions and provide support for using multimodal technologies. It is crucial to consider how digital tools with specific affordances and constraints can be used for multilingual learners' meaning-making and explore effective collaboration strategies for educators with multilingual learners of varying proficiency levels and backgrounds. The ESL research promotes the transformation of ESL writing instruction by leveraging multimodal approaches that cater to the needs of multilingual learners.

However, in the ESL context, there have been potential challenges that might hamper the inclusion and evaluation of DMC interventions as instructors' readiness for inclusion of multimodal practices, as it has been a practical framework if it has been combined with pedagogical technological frameworks (Mishra & Koehler, 2006). It was found that the instructors are ready to incorporate these innovative pedagogical practices in their contexts, provided that sufficient institutional support is available to facilitate instructors. Also, it has been interesting to note that technology should not supersede content knowledge or vice versa; preferably, the aim should be to complement these two skills. Such issues could be addressed if the professional development programs for writing instructors focus on what is essential for developing literacy and communication practices through digital multimodal composition and ways to include and evaluate linguistic and digital literacy.

Shift to Multimodal Perspective in ESL Context

The New London Group (1996) founded the idea of multimodality and the term '*multiliteracies*' refers to numerous literacies beyond language. The argumentative writing unit for the study was created using the multiliteracies educational paradigm of the New London Group (1996), which was based on Hyland's genre pedagogy. Learners were placed in situated practice by analysing many texts, where they shared their prior knowledge of various themes or issues and engaged in discussions and writing about their replies. The learners received genre-based teaching from the instructor on multimodal texts and design features, enabling them to make informed decisions about using modes and design structure when they had a firm understanding of the design process. The learners used critical framing in their analysis of and in constructing their argumentative essays to increase awareness of social ESL context

and design purposes, and finally, learners exhibited transformed practice through their construction of multimodal text (New London Group, 1996, p. 88).

Kress (2005) explores the idea of multimodal communication, particularly concerning the technological advancement and sprawling nature of traditional writing, as an essential member of the New London Group (1996). There has been an outcry over the inclusion of multimodal ways of communication that contends multimodality detracts from composition curriculum by diminishing the written words, which in turn does learners' writing a striking deal of harm and is of no good. Kress (2005) stresses that communication has always been multimodal, with cultural norms dictating dominant forms. He argues that there is a revolution in communication, and we are now witnessing a shift towards valuing images more. The idea that writing is vital to communication has long been a convention that did not warrant thinking critically. The rise of new media offers multiple entry points, catering to diverse audiences. There are shifts of roles, and readers and writers are not passive consumers. Each mode has unique material qualities that influence meaning-making. Words and images serve different purposes. Written text unfolds linearly, while images offer a holistic view. Kress (2005) does not advocate abandoning writing but instead finding a balance between word and image, which he calls gains and losses.

Yancey (2004) observes how reading practices adapt to media. Novels, once serialised, were interactive, with audience feedback shaping the story. The rise of digital communication has changed how learners write and read. Much writing happens outside the school in non-traditional forms. Kress (2005) argues that education cannot solely focus on printed text. We need to prepare learners for a changing communication landscape.

There is a cultural shift, and we are moving from speech-based cultures (linear thinking) to image-based cultures (simultaneous processing). This could fundamentally change how learners interact with the world. Such a shift should also be witnessed in the ESL curriculum and academic writing context, as writers in ESL contexts are exploring multiple ways to express meaning-making avenues. Such an approach is integral and encourages inclusion, as well as numerous ways to assess digital multimodal composition, as there is a need for theory to combine different modes in creating and interpreting texts effectively (Khalid & Janjua, 2024). Kress (2005) challenges the idea that meaning-making is dynamic and does not occur in a static environment, emphasising its ever-evolving nature. Ron Fortune (2005) reminds us that representation modes are not neutral. Cultural and social factors influence dominant modes of meaning-making. Kress (2005) highlights the rise of multimodality and the need for education to adapt. He emphasises the importance of understanding the strengths of different modes and the evolving nature of communication.

Instructors might not understand the importance of multiliteracies, especially in ESL settings where writing output is prioritised over text development and design. The New London Group (1996) distinguished between multiliteracies and *'mere literacy,'* a structured system limited to language and practised by adhering to a set of rules (p. 64). Their theory of multiliteracies broke from the kind of framework by accepting a variety of modes whose creation was influenced by social practice instead of following a set pattern. Semiotic materials and their social use are also essential to social semiotics (Jewitt & Kress, 2009). The instructors in the intervention did not always see the benefits of the technique, which aimed to implement such a belief system in a pedagogical ESL context. The viewpoints of the instructors mirrored a

debate in the literature: Does digital, multimodal composition require the same degree of thought as traditional writing? According to Skaar (2009), multimodal composition requires lower degrees of thinking than conventional writing; Adami (2011) refuted Skaar's claim that cognitive abilities were honed in multimodal, digital works but might not be the same as those employed in traditional writing. According to Alvermann (2011), '*reifying monolithic categories*' is unnecessary and might harm learners. He addressed the necessity of comprehending each specific place or applying the notion to the study, together with multimodal and conventional writing, instead of focusing on dichotomies between traditional and online learning environments.

The instructors' preference for traditional literacy over multiliteracies may have limited the intervention's success. There might have been that instructors did not value or recognise the multiliteracy skills pupils demonstrated, which prevented them from growing in that area. For example, the learners demonstrated creativity, multimodal design, and understanding of the argument's constituent parts in their infographic. As was found in the smaller-scale study and has also been identified as a concern in the existing research, instructors may give in to external pressures if they lack a clear understanding of the benefits of incorporating multiliteracies in classroom teaching. Examples of these pressures include focusing on educational standards that help learners perform well on standardised testing and excluding multimodality and multiliteracies from their classroom curriculum (Siegel, 2012). Despite each instructor's increasing professional knowledge of argument and digital technology, the present study's concentrated approach to integrating these tools into instruction demonstrated that they hesitated to use such learning in their future instruction. The instructor bemoaned the challenge of teaching learners to use digital, multimodal resources while incorporating an argument writing curriculum with higher technical

proficiency. The instructor claimed to have learned about digital tools through the intervention, yet all they showed was that they had accepted the intervention's traditional writing components. The assertion indicates that her self-efficacy with teaching using digital, multimodal technologies did not develop in proportion to their progress in technological expertise.

Conclusion to the Chapter

The study examines how combining different approaches can be used to create and analyse academic arguments. It has been done by interrogating how learners produce academic arguments in Google Sites in an ESL context. The visual analysis was based on the VG-informed visual rubric developed for the study, based on the social semiotics multimodal framework used to create the visual rubric. The framework combines theories from diverse perspectives, such as for argumentative writing; it employed Toulmin's mode of argumentation and social semiotics for the visual rubric. Its strength lies in that it can be applicable across media and genres. The writing and visual compositional resources employed to realise the argument in the texts explored in the study have been reviewed in the ESL context. Drawing on Kress and Leeuwen's (2006) categories of experience, the study has conceived a '*conceptual*' approach to reflecting on an argument in an ESL context. The study proposed that a timeless quality characterises a conceptual argument and structures information following the GeM framework.

In the analysis part, the quantitative analysis highlighted that the learners significantly improved their DMC project during the intervention period. The qualitative analysis revealed that mixed results offer insights that otherwise might not have been possible to unearth, such as compositional aspects of the rubric, including multimodal ensemble. Following Kress (1989), the study has defined an academic

argument as the textual and cultural expression for bringing about differences. It is proposed that differences ignite discussion, and such academic talks are essential to bring a topic under controversy. The differences across different modes can be realised by overlapping and superimposition one mode over another. The research has proposed how different learners employ Toulmin's Model to establish differences in an argument. In analysis, it has been revealed that an argument has been illustrated with various interpretations through multimodal persuasion devices. The study demonstrated how visuals, images, graphics, interactivity, and proximity, having the interviewer positioned in a frontal position addressing the audience, can establish and create a social relationship with the rhetor.

The study also establishes that using visuals, images, and graphics in an argument invokes resources that confer authority, thus helping to establish ethos, which the model of argumentation does not account for in establishing credibility categorically. It demonstrated that graphics strengthen the arguments by providing statistical data, and visual citations add credibility. Adding personal information such as email addresses and pictures of the authorial figure helps establish visual signifiers and ethos through colour coordination and the placement of frames. Though the model asks for a counterargument that acknowledges the opposite side, few learners have addressed the aspect in their visual argument. The ethos has been built using icons, symbols, layouts, and images in visual arguments.

Interactivity and multimodal orchestration through colour differentiation helped develop a multimodal argument and contributed to the digital multimodal composition of the argument presentation using Google Sites. Such compositional components of an argument add coherence to the argument. Google Sites allowed learners to design their arguments using frames, layout, themes, and editing. It gave

an example of referencing a written text by highlighting the page or paragraph from which the citation is taken and using colour differentiation to highlight the mentioned words. Because it makes the quoted text's materiality visible, the citation style facilitates an embodied understanding of the text it references. By instructing the user to fill in the material in specific spots on the slide, Google Sites' default template feature offers users socially acceptable layout design options. Conversely, the user can create the layout with the blank slide option.

The study built and identified several tools and organisational structures for the learners to reflect on digital multimodal composition using a visual rubric during the genre-based intervention. When it comes to academic argument, a multimodal social semiotic approach acknowledges that disagreements arise about mode, genre, discourse, and media. I have maintained that the argument is not mode-specific concerning mode. Every approach has advantages for conveying different facets of a dispute. A multimodal argument strategy aims to organise resources for communication in a text. As I have argued, learners might be better prepared for communication in the modern world by being aware of modes and their general affordances for argumentation and communication. As I have shown, many genres allow for various realisations of scholarly arguments. Offering several ways to interact with the argument in the academic setting can inspire novel techniques for conceptualising and interacting with academic arguments.

It may also make people consider the advantages and disadvantages of using different media to disseminate arguments. The study's pedagogical implications are outlined for multimodal genre-based pedagogy that can facilitate the learning process and empower learners. Over the past few decades, diverse media and digital technologies have changed from auxiliary learning tools to the primary means of

gathering and disseminating information. People are making meaning increasingly multimodally using written-linguistic, visual, audio, gestural, and spatial patterns of meaning, whether because of the demands of '*new capitalism*' (Gee, 2008), the accessibility of low-cost technology, or the universal human desire to communicate and express themselves creatively. With today's technology, we can virtually extend ourselves anywhere in the world at any time (McLuhan, 1994). Literacy growth was demonstrated by tangible multimodal texts created for real audiences that can be viewed, assessed, and debated (Blikstein, 2008) and the range of literacy practices used in their creation in the current study (Yi *et al*., 2020). Educators and instructors are urged to find strategies for getting learners involved in developing multimodal texts to ensure that learners have access to and are prepared for technology.

CHAPTER VI. CONCLUSION

Chapter Overview

The chapter summarises the overall study's implications of how the study builds on genre-based pedagogy through a formative experiment in any ESL context and how the learners draw on multimodal semiotic resources to realise the digital argument using Toulmin's argumentation framework. The chapter reports the implications of genre-based pedagogy and a multimodal classroom and outlines their digital affordances, possibilities, and opportunities, including assessing ESL multimodal writing tasks. It discusses the limitations of this investigation. The chapter gives implications for academic writing in ESL's current text and advocates for a multimodal approach to academic argument through genre-based instructional pedagogy. Genre-based instructions recognise learners' strengths and allow them to experience and experiment with writing approaches and evaluation practice in the ESL context. The concluding chapter precludes that there is a need to reconsider various available multimodal resources and innovative writing approaches to help undergraduates prepare well for their professional and academic lives to communicate, and that is what the study hopes to contribute to researchers and practitioners.

Review of the Results

The New London Group (1996) conceived the idea of integrating digital multimodal tools in academics and encouraged writing instructors to value innovative approaches and develop learners' competencies in creating their multimodal texts; several researchers embarked on the journey of exploring multimodal approaches in writing and deliberating the means and processes off including and evaluating multimodal approach in the ESL classroom effectively, despite everything, there is a dearth of

giving a comprehensive outlays that would inform the decision-making process involved in the writing centres to help them integrate and assess multimodal approaches and practices in their academic curriculum, the study attempted to inflate the cleft by recommending a framework for integrating and developing DMC based instructions and through an assortment of assessment practices (Graham & Benson, 2010; Sewell & Denton, 2011). The research has been influenced by a range of theoretical underpinnings, such as multiliteracies, multimodal social semiotics, and genre-based pedagogical instructions through a formative experiment based on ESL settings. It attempted to address the issue by taking on board various stakeholders, such as learners as crucial participants, writing instructors, and program coordinators. The formative experiment in the ESL context helped identify a clear pedagogical goal, designed an intervention based on that goal, enhanced factors during the intervention process, and set out to achieve results that complement endorsing intervention in the ESL context at an undergraduate class in a private institution. It investigated the possibilities of including digital multimodal composition in the ESL context, foregrounded in the perspective of multiliteracies, and helped learners build competency through genre-based instructions. It found that progress toward achieving the goal helped learners produce significantly crucial digital multimodal blogs with verbal and visual components. It was interesting to note that the learners were engaged, enabling them to construct academic arguments covering a range of issues of interest that also foster socially responsive learners aligned with the values of SDG-4. Thus, the journey has indicated progress, and such engagement would benefit their educational progress.

However, qualitative and quantitative analyses identified areas for future research and further improvements (Gravemeijer & Cobb, 2006). The work addressed

the request made by Newell *et al.* (2011) for scholars to close the gap that existed between the social and cognitive practices of argumentation (Newell *et al.*, 2011). Learners were encouraged to create and mediate these arguments in a way that promoted social practice using the semiotic resources and digital tools at their disposal. The intervention integrated the cognitive structure of argument, which consisted of claims, evidence, and elaboration of evidence. In the claims covered in the chapter, I contend that learners had a deeper understanding of argument components and the possibility of multimodal argument design due to the intervention. I argue that the effective implementation of multimodality requires the professional development of instructors in the ESL context, including recognising its value and integrating multiliteracies and multimodality across curriculum and content areas for a diverse body of learners as part of the ESL practicum. Future studies on professional development, together with the importance and inclusion of multiliteracies, were all mentioned in the earlier claims. The study allowed instructors to integrate concepts of multimodality needed for practical guidance, yet future research is still required. The quantitative findings revealed that there has been a significant improvement in learners' argumentative and visual skills before and after the study, thus proving the hypotheses based on the evidence that genre-based instructional intervention positively influenced the argumentative writing performance of ESL learners while developing multimodal texts in an ESL writing course in Pakistani context. The quantitative data analysis suggested that the stated hypotheses were accurate; despite everything, qualitative assumptions needed to be studied through the lens of theoretical underpinnings. Such formative experiments demanded a holistic data analysis, triangulating from several sources that could be outlined through scrupulous analysis and discussion.

In this study, engagement is understood as students' cognitive, emotional, and participatory involvement in digital multimodal composition tasks. Drawing on Fredricks, Blumenfeld, and Paris (2004), engagement encompasses three interrelated dimensions: first cognitive, reflected in students' effort to organize, synthesize, and critically evaluate ideas; second emotional, demonstrated through interest, motivation, or frustration expressed during composition; and last, behavioural engagement, observable in active participation, sustained attention, and the multimodal resources learners employed to develop arguments. Within the present analysis, engagement emerged as a critical finding, as evidenced in student reflections and multimodal artefacts. For example, one learner noted, "I tried to combine images and statistics to make my argument stronger," highlighting both cognitive effort and multimodal resourcefulness. Learners' motivation to communicate successfully increased when they created information about the foremost subjects and felt a connection to them. The study's participants spoke of their projects as themselves instead of distinct subjects, demonstrating a desire to be recognised as unique people with valuable experiences and opinions. The learner was '*on the hook'* to represent the material they felt personally accountable for since they connected it to the subject. Providing these chances for learners also puts the onus on the instructor to minimise any potential adverse effects of using technology. The curriculum was fundamentally designed meticulously and implemented to accomplish the goal. It integrated genre-based writing instruction with multimodal composition as procedural assistance through various stages of genre learning. Explicit scaffoldings were necessary for ESL learners to investigate multimodal resources offered in multimodal composition assignments or other pedagogic or non-pedagogical contexts. Learners essentially comprehended the contextual elements that influenced the suitability of discourses

and resources for the reception and creation of genres. ESL writers were to be better equipped to learn target genres through multimodal composition with an understanding.

Inclusion and evaluation offered opportunities for ESL learners. Learners who were strongly driven to convey their ideas might combine different modes, allowing them to follow conventions of academic writing yet flexibly present their composition. Such an assignment allowed them numerous means to express themselves. Learners produced engaging works with more freedom, and it was a sine qua non for them to express themselves. Numerous learners in the research stated that they represented and reinforced their concepts by harnessing various approaches. They frequently and skilfully employed theme and symbolism because they understood how structure, colour, and image are used to conceivably convey an idea. Using digital technology for this opened even more possibilities because it made design and technology more accessible, and many modes combined to produce more public compositions than traditional essays. When learners integrated multimodal composition with technology, the concept became real.

The visual rubric added significantly to the compositional meanings of their digital multimodal compositions that otherwise would not have been possible in traditional written arguments. The study offered learners' perspectives on what they have gone through in producing their digital multimodal composition tasks, successes, and constraints that they confronted during the process of composition in the ESL context. It was interesting to note how the learners combined digital tools with writing competencies to demonstrate the competence of creating meaningful learning experiences for producing blogposts, significantly enhancing learners' impact as effective communicators. All of the study participants were engaged, which suggested

that even if there were legitimate challenges that learners have had when harnessing technology, all three components needed to be included in academic writing classes grounded within the digital multimodal composition.

According to Bateman (2008), the GeM framework has been designed to establish a foundation for an investigative approach that is robust enough to advance theoretical understanding empirically. The study offered genre and multimodal affordances, such as a class exploring personally meaningful issues that nurtured engagement and reasonable faith efforts among learners and formed a community of subject matter experts who practice communicating that expertise. Each study participant had a speciality that advanced mutual respect and fostered collaboration in the classroom. When every learner had a unique topic intimately related to their identity, collaborating to produce the best projects became a class objective that everyone contributed to for themselves and other learners. Relevant subjects effectively fostered a sense of community among learners and instructors. A variety of means further reinforced these relationships. Lastly, the most crucial aspect that had been covered was instructors' beliefs and readiness for integration, inclusion, and evaluation in digital multimodal composition in the ESL context.

Conclusion of the Study

The study aimed to learn more about the experiences of composition learners who were expected to use digital technologies to accomplish multimodal projects. The prevailing consensus in the field of rhetoric and composition literature was that, for undergraduate learners, since most people who used technology were self-taught, academic writing was required to emphasise using technology rhetorically more than teaching learners how to use it. An examination of the project reflections was employed in the study to illustrate the many ways in which learners reported

encountering challenges related to technology. It also demonstrated how learners encountered extra difficulties when inherent conflicts in the assignment design were inadvertently created. The learners took a significant issue, used various media and digital technologies to illustrate and explain it, and then imagined a potential audience that could have been impacted in numerous ways through multiple modalities. Teaching this lesson was a powerful example of the digital age's tremendous options. Digital multimodal composition assignments made a significant contribution to the academic writing curriculum, one that academics would have kept researching and supporting, even though the difficulties that learners faced with technological dead ends outside of the classroom were unsettling and required thoughtful explanations.

The thesis identifies the advantages of different genres and modes for developing scholarly arguments. The study is foremost in three ways. First, expanding an argument theory from a genre and multimodality standpoint has contributed theoretically. According to this viewpoint, the argument is a design artefact influenced by the resources present in the environment and driven by the rhetor's desire to convey a specific message within a particular setting. Additionally, it has been suggested that embracing this perspective on argument entails acknowledging. That argument relates to social text categories and is a form of cultural text. Second, the study has contributed to the methodology by offering a framework and a metalanguage for analysing and debating multimodal arguments. Theories from genre multimodality and rhetoric are combined in the framework to outline the structure of a multimodal artefact in the ESL academic context. According to the study, the framework's strength is its adaptability across various media and genres. Thirdly, the study has contributed to pedagogy by offering strategies for creating arguments appropriate for modern communication. Hopefully, the study's affordances will

stimulate more investigation into the potential applications of a multimodal approach to academic argumentation in other fields that represent a pathway toward more inclusive, equitable, and sustainable learning for all.

Study's Limitations

The results of the study cannot be applied to a larger context because it is based on a convenience sample from a single private, urban, English-medium university in Pakistan also, the participants' experiences may not fully represent the spectrum of experiences that could occur in diverse contexts and with different learners. Generalisability was limited because of the small number of participants and the subjective nature of the data collection. The amount of honest information participants offered suggests reasonable faith attempts, but this is distinctly possible affected their reporting as the reflections that made up the dataset were also included in projects that learners completed at an undergraduate level. Even with the limited scope, delving into these issues has the potential to unlock fascinating discoveries in learners' digital multimodal composition practices in the ESL context. Consequently, the findings may be interpreted with caution when considering broader generalisations.

Recommendations for Future Studies

The study's participants showed great excitement for working on subjects that were relevant to them personally. In their reflection papers, most learners were nevertheless able to demonstrate a solid grasp of the rhetorical situation, even though many of the narrated documentary projects needed improvements. By doing this study over numerous classes, more information about the persuasive power of personal narratives and the development of a thorough comprehension of the rhetorical situation may become apparent. Classes with individual themes would have contrasted with those without, allowing for the possibility that topic choice would affect how well learners

advanced toward rhetorical literacy. Extending the scope of the research to encompass other classroom environments would augment the participant count and unearth supplementary extracurricular encounters concerning the utilisation of digital technology for multimodal initiatives.

Additionally, this would offer more information that would validate parts of the study's subjective reporting and broaden the applicability of the conclusions. Furthermore, no account was taken of a learner's past use or access to technology. Thus, future research might ascertain learners' access range to see whether there are differences between those with restricted access.

Although Selber (2004) emphasised a critical approach to technology, his teaching with digital tools seemed to prioritise mastering communication techniques over delving deeper into the technology's potential for more affluent exploration and communication learners through multimodal communication while developing their multiliteracies. This study explored learners as '*self-teaching'* users of technology, designed to delve into the world of learners. In contrast, the study investigated whether personally relevant topics influenced technology use; it did not explore a critical approach to technology or integrate course content that fostered critical literacy in this domain. This study laid the groundwork for understanding how personal relevance could motivate technology use. However, further research sheds light on the additional impact of critical technical literacy. There were two key areas for future exploration: first, future studies involved participants from a class incorporating a critical technical literacy component. This would allow researchers to explore how emphasising a critical approach influences learners' understanding and use of required technology. Secondly, the study highlighted the potential of personally relevant topics to motivate technology use.

Further research could delve deeper into how to assess this motivation's effectiveness. Specifically, studies need to investigate methods to determine if pursuing relevant topics empowers learners to overcome specific technological obstacles. Future research could delve deeper through case studies of classes designed based on the recommendations above, building upon the study's findings. These case studies may investigate how attempts to minimise technological impasses affect learners' experiences and engagement with technology and what classes incorporating participant suggestions, peer-to-peer collaboration, in-class tutorials, and technology demonstrations effectively mitigate these impasses in the ESL context.

Future research should evaluate the writing processes involved in standard and multimodal writing, as processes and products are almost synonymous when assessing composition. Moreover, the identical learners' writing and DMC task outcomes were compared using the same cases in both situations across genres. The potential impacts of task practice should not be disregarded, even though the methodological choice prevented the task content or reading source from influencing the study results. To account for practice effects, parallel copies of task genres with distinct topics are necessary for future replication studies. A few studies focus on multimodal writing in the ESL context (Silver, 2019). The current case study examines the inclusion of a diverse writing portfolio combined into a single undergraduate and one or myriad graduate courses to investigate learners' attitudes and performance in academic writing.

Implications

The study is significant for researchers drawing on learners' digital multimodal composition processes and designing or modifying assessments through the lens of visual rhetoric. The results showed that learners participated in a recursive writing

process in DMC that mirrored the principles of conventional rhetoric. The use of various materials by learners from multiple discourse communities indicates that audience and purpose can help learners make deliberate decisions. During the design process, decisions are not always made with intention. Whether stated or not, awareness was a crucial component of the learner's learning process. One suggestion for future research should be to investigate aspects of the internalisation of learning with genre and multimodality in diverse contexts.

The DMC rubric and other choice-based evaluations are appropriate tools for learning as an iterative part of the writing process. Instructors tend to focus more on writing than on enhancing composition plans or self-assessments. The contract determined the design plan. Furthermore, design choices suggest that explicit instruction in identifying rhetorical goals and the most efficient devices or methods is necessary. Reflection, a different assessment level, addresses that not everyone will *'get it'* at the moment. Evaluation and introspection were essential. The instructor intended to give learners agency in the learning process, even though he knew he would have to demonstrate learning to meet stakeholders' expectations. However, he believed other project elements were more significant than the assessment. Multimodal research investigations have also shown evidence of engagement (Smith, 2014). The study investigated a DMC intervention in an ESL context within a genre and multimodality framework. This partnership was motivated by the sincere desire to equip learners for success outside of the confines of an ESL classroom. The intention was to challenge the traditional literacies that are taught in schools. This study is among the few that employ quantitative data analysis to explore multimodal writing (Vandommele *et al*., 2017; Kim & Kim, 2019; Kim *et al*., 2021), seeking to identify recurring patterns among individuals. The findings indicate that the quality of

language and verbal delivery, along with the quality of multimodal performance visualisation, accounts for 81% of the overall quality of multimodal writing performance, with language and verbal delivery being the more significant predictor. Furthermore, the overall quality of language and verbal delivery scores showed an essential and robust correlation with the ESL writers' total scores and sub-scores in argumentative writing.

Second, the study employed a mixed methods approach to examine the multimodal writing process. Qualitative analysis leveraged excerpts and examples to provide rich detail, while quantitative analysis focused on frequency and time duration data to offer a more objective perspective. By combining these approaches, the study sheds new light on how multimodal writing unfolds. Additionally, the quantitative data provides a solid foundation for further research that delves deeper into specific aspects of the process using quantitative methods. The study posits that multimodal academic argument is fundamentally oriented toward *'assemblage'* as a central principle of composition. Intertextuality theory acknowledges that *'[a]ll utterances depend on or reference other utterances'* and that '*no utterance is singular'* but is always infused with *'other, competing, and conflicting voices'* (Allen, 2012). The theory emphasises that "relationality, interconnectedness, and interdependence" are integral to every phase of text creation (Allen, 2000). Given that all text creation involves weaving together the words of others, Barthes (1977) famously asserted that intertextuality effectively leads to the extinction of the author.

There are instances in academia where institutional constraints or biases may hinder authentic pedagogical innovation. While intertextuality is taken for granted as a theory of text-making, '*the author*' and '*originality*' are nevertheless valued in practical application. As suggested in earlier chapters, this trust in originality

encourages learners to conceal citations, which results in plagiarism (Johnson-Eilola & Selber, 2007). A writing strategy that involves assembling existing texts to address a new communication challenge, Johnson-Eilola and Selber (2007) argue that the concept of 'assemblage' moves us beyond the hierarchical relationship between 'original' and 'borrowed' texts, as well as the obligation to obscure cited materials. They suggest that if learners are rewarded for their ability to locate texts and derive new meanings, plagiarism in learner texts may become less of a problem. It is worth mentioning that even though assemblage draws attention away from uniqueness, agency, and crediting of an individual's work are still there. The composition concept of assembly places the author in the forefront as the producer (Trimbur, 2000), the designer synthesising existing materials to produce fresh interpretations. The examples demonstrate that assemblage involves repurposing preexisting materials to create new meaning. This viewpoint maintains that individual labour is not forfeited. As a composition principle, assemblage acknowledges a person's capacity to construct socially and culturally accessible materials to produce new meaning.

A multimodal preposition to academic argumentation forces one to prioritise recognition as a composition principle and emphasises acknowledging the affordances of several forms, media, and genres for crafting an argument. The conceptualisation of recognition by Archer and Newfield (2014) was a highlighted theoretical framework. First, they assert that recognising involves bringing semiotic resources into view. A culture of creativity can be sparked by making semiotic resources and their affordances for the meaning-creation public, since this motivates people to investigate and take advantage of a resource's potential. It is possible to expand the concept of resources to include embodied resources, such as collective projects. For instance, the study demonstrated the value of group work in filling in the gaps in

digital literacy. From the equality perspective, recognising less prevalent means of communication and representation is another benefit of making different semiotic resources visible. According to this viewpoint, a recognition pedagogy can raise the issue of *'what gets recognised and by whom?'* to the fore (Kress & Selander, 2012).

According to Archer and Newfield (2014), recognising something entails using a metalanguage to theorise and comprehend the resource. Metalanguage is crucial because it offers a vocabulary for discussing and analysing semiotic resources. Several digital tools for creating multimodal arguments using the metalanguage suggested by the framework for analysis have been identified and examined in the study. Finally, Archer and Newfield (2014) indicate that assimilated resources in many educational environments are necessary for recognition. The results of the investigation suggest that the digital divide may impede a multimodal approach to academic argumentation. However, a digital divide in Pakistan is a fundamental problem, which makes integrating digital technology into the classroom even more necessary. In other words, if social injustices cause a digital divide, the university and the instructor must overcome this gap by introducing learners to digital resources through curriculum inclusion that persists in ESL classrooms, potentially undermining the inclusive goals of SDG-4 and necessitating targeted support for marginalized learners. According to this viewpoint, combining various resources can lessen social injustices and promote empowerment.

One example of how traditional writing teaching goals can be combined with new goals related to new forms of digital literacy is the creation of multimodal arguments. It also shows how creative the multiliteracies perspective could guide approaches to writing teaching that boost creativity and engagement. It also highlights difficulties for both learners and their instructors. As an illustration, in our experience,

even though learners seemed interested in producing DMC and eager to collaborate with their peers, they frequently struggled to make the connection between the broader affordances of digital writing and the conventional writing process, posing probing questions such as *'What does this have to do with our argument?'* Even while learners were writing digitally outside of the classroom, they did not quickly get used to integrating pictures, music, sounds, and videos for academic assignments, such as creating a well-developed argument. For learners to make the connection between the increased options for creative expression, the broader affordances of digital writing formats, and the essential principles of effective communication, such as building convincing arguments through guided practice, may be necessary. As mentioned, it could be beneficial to research how explicit instruction and training are incorporated into educational activities, and interventions could help learners write arguments in both traditional and novel ways. As an illustration, (MacArthur, 2006), in his analysis of how technology has an impact on writing, discussed how writing online can help learners think more clearly: the combination of case studies and experimental research demonstrates that creating hypermedia necessitates sophisticated cognitive functions and can aid in their development. He does, despite everything, note in his review's conclusion that additional study is required on the interventions about technology and learner writing because there is currently little on these novel types of writing. Even though numerous studies demonstrate the importance of strategy education in writing instruction and the enhancement of learners' writing (Graham & Perin, 2007), many of these studies say nothing about how the research relates to writing or technology. According to Graham and Perin (2007), there are few studies on the relationship between writing and technology: *'The results of this meta-analysis do not offer clear guidance for the use of technological tools other than word processing.'* According to

the authors, the lack was attributed to *'gaps in the current state of research on writing instruction'* (Graham & Perin, 2007). Therefore, evidence from studies demonstrates the advantages of strategy instruction for learners' writing (Graham, 2006; Graham & Perin, 2007). Concerns remain about how these stratagems impact digital writing if conventional training applies in a digital context and what additional strategies might be needed to facilitate writing in the multimodal era.

Previous studies have concentrated on how technology can assist with traditional writing (Graham, 2008; Graham & Perin, 2007) instead of the methods required to assist learners in producing multimodal works. We argue that research aiming to support practitioners in making informed decisions clearly demonstrates how concepts like genre, multimodality, and the understanding of writing as a creative, meaning-making process in digital contexts can be effectively applied in real-world educational settings. Such studies would concentrate on how adequately traditional and contemporary learning objectives are accomplished, how sufficiently they may be combined, and the conflicts they may cause. It would acknowledge the views and perceptions of instructors and learners, emphasising the effectiveness and attraction of educational activities. Using DMC to write multimodal arguments: Learners appeared astonished that digital tools could be used for traditional academic tasks such as writing arguments in the genre and multimodality (GeM) framework application in the classroom.

Despite these cautions, learners possess many creative skills from engaging with digital environments outside the classroom, where literacy is ingrained. They have access to a plethora of technical expertise and innovative energy due to their digital lifestyles, which could provide a compact foundation for exploring more configurations between traditional writing instruction and enlarged perspectives, such

as multiliteracies. For example, they are highly skilled at using technology to create and edit audio and video clips, download and upload data, copy and paste digital photos, and engage in various social networking activities. They do not seem to know how to use their knowledge of the developing digital communication cultures and their proficiency with technology outside of the classroom to assignments for school and the more consequential goals of responsible citizenship. They have to apply the creativity that multimodal instruments offer. Even so, in the increasingly complicated and diverse world of digital data, they must be constrained by factors such as evidentiary standards and a willingness to seek out and evaluate information actively. They must assess, understand, and creatively integrate several media into multimodal constructions of meaning while figuring out the objectives and content of relevant sources. After determining whether the information can support their positions, they must use digital tools to create and share compelling arguments. We believe that the skills, methods, and mindsets allied with the inventive production of meaning via digital tools are no more inborn than those essential for the less complex and more restrictedly focused conventional forms of writing. Because of the many benefits of digital media, writers today have to make more complex and unique decisions without being limited by preset, if not formulaic, techniques. There are challenges for both kids and instructors, but there are also many attractive opportunities for artistic expression.

Expanding the number of compositions examined would be a logical next step in terms of additional research recommendations, aiming to test, reconsider, and potentially expand the named and described content representations. A study on the visual development of other kinds of subject matter would also be intriguing, as this would encourage the use of metalanguage in these kinds of materials. By

implementing this recommended research, a *'shared repertoire of codes'* would be constructed (Pauwels, 2000) among researchers studying learners' visual interpretation. One notion about content representations that has already been presented is to investigate how representations are distributed throughout various science content and other kinds of content. It would be appreciated if research were done on how young learners use content representations in talks about meaning design unfolding and how distinctive design decisions alter the gist of the content (Bezemer & Kress, 2008; Jewitt, 2013; Mills, 2015).

This study explored the perspectives of ESL undergraduate learners who created DMC projects in their writing and communication classes. Qualitative analysis revealed that learners actively examined the affordances of multimodal communication and the conventional constraints they faced, as they were encouraged to use diverse modes of expression. These findings contribute to existing digital literacy research on ESL learners, emphasising the importance of amplifying learner voices and supporting them in composing and designing as they draft digital texts. The learners' belief that multimodal composition offered valuable opportunities to express their ESL identities and interests aligns with previous studies (Smith *et al*., 2021; Yi *et al*., 2020). DMC presents multiple avenues for ESL learners to connect their experiences with the world while pursuing academic goals (Cummins *et al*., 2015; Smith *et al*., 2021). Additionally, the learners' preference for DMC over traditional academic writing corresponds with earlier research showing that ESL learners who enjoy greater flexibility, agency, and creativity in expressing their ideas are more engaged, motivated, and connected to their DMC projects (Goulah, 2015; Jiang & Luk, 2016).

Through the learners' multimodal projects, these ESL learners discovered that they could engage with academic material creatively, another insight provided by the study. They emphasised how they developed a unique sensory and emotional understanding of the content and conceptualised literary ideas through sounds and images. By integrating various forms, learners could 'understand' the historical and cultural context of the topics they studied on multiple levels. These results highlight the potential of multimodal composition to facilitate learning across different subject areas (Grapin & Llosa, 2020; Smith, 2017; Vandommele *et al*., 2017; Zheng *et al*., 2014). The study also illuminates how ESL learners used their multimodal projects to engage with academic content in innovative and creative ways. In addition to developing a distinct sensory and emotional connection to the subject matter, learners described how they conceptualised literary ideas through visual and auditory elements. They grasped the cultural and historical contexts of the topics they studied by layering diverse styles and forming multi-dimensional connections.

The implications of these findings extend to integrating multimodal composition in ESL classrooms. As highlighted, learners encountered various challenges related to multimodal composition, including technical difficulties, integrating group projects, and finding the appropriate modes to convey their ideas effectively. Some high-achieving learners, particularly those who excelled in writing, expressed confusion when asked to express their ideas using texts, themes, colours, visuals, movement, and sound.

Despite implementing a scaffolded workshop approach, the classes provided opportunities for learners to analyse a range of examples, engage in clear writing and technical instruction, reflect on their work, and explore their preferred modalities in addition to receiving explicit technical training. Nevertheless, some learners faced

multiple constraints (Dalton, 2012, 2014). This raises the additional challenge for teacher training programs to equip instructors with the necessary skills to navigate rapidly evolving technological advancements. With the growing number of ESL learners (Kohnke *et al*., 2021), research should prioritise examining the challenges associated with technology use in the classroom and strategies for instructors to effectively collaborate with learners from diverse backgrounds and language proficiency levels (Ajayi, 2009; Angay-Crowder *et al*., 2013). Moreover, instructors must consider the unique advantages and limitations that different modalities and digital tools provide ESL learners in meaning-making.

Finally, these findings underscore the importance of recognising the voices of ESL learners, who are often marginalised. Although they are the primary beneficiaries of curriculum innovations like multimodal composition, their perspectives as educational stakeholders are frequently overlooked. Therefore, researchers and educators should prioritise the experiences of ESL learners by listening to their viewpoints and learning from their insights. These outcomes suggest a need for national curriculum designers to integrate multimodal literacy frameworks, advancing both language development and Pakistan's progress toward SDG-4, and are encouraged to embed DMC as a core component of writing pedagogy, particularly in ESL contexts where traditional, text-centric approaches dominate. By aligning curricular goals with multimodal literacy outcomes, learners can be better prepared for real-world communication in digital and global contexts. The study encourages language instructors to reflect on their current writing pedagogies and incorporate digital tools into their composition classes by invoking structured training on multimodal assessment, equipping instructors with frameworks such as visual grammar and genre-based rubrics to evaluate multimodal texts fairly and effectively.

Finally, language instructors should be encouraged to scaffold digital writing tasks using explicit instruction in genre structures and communicative purposes, thereby supporting students' development of critical thinking and rhetorical awareness across modes. Such changes will directly benefit learners in English language classes. Furthermore, the study contributes to scholarship in digital humanities and interdisciplinary research by providing insights and fostering discussions on various digital platforms while exploring the benefits of multimodal writing in ESL composition classes. I hope the study's findings will annex a newfound understanding of teaching writing and composition and result in future studies in the domain of genre and multimodality in the ESL context, and these steps would make DMC a sustainable and pedagogically sound part of English language teaching in both local and global educational landscapes.

Future Iterations

The goal of formative experiments is to give instructors clear direction on enhancing their lessons (Reinking & Bradley, 2008). In light of these recommendations, future reiteration can be designed. Such replications have dialectical purposes, one for education purposes (Makel & Plucker, 2014) and second for the methodological perspective as these formative experiments have been replicated across genres and disciplines; as Reinking and Bradley (2008) noted, *'formative design experiments are replicated across diverse instructional contexts, they may reveal generalisations and theoretical findings that transcend the complex variability across classrooms and the Instructors and learners that inhabit them'* (p. 42). I provide the following suggestions for researchers interested in looking to replicating a comparable intervention, considering the study's findings:

- Despite everything, the crucial aspect of genre and multimodality in developing digital multimodal composition skills through metalanguage in various contexts is that such metalanguage in DMC as an intervention in the ESL context needs further probing.

- The study touched upon argumentative writing using visual and verbal modes to pave the way for digital multimodal composition as an intervention into the ESL context, the other forms, and ways of making an academic argument through other digital multimodal means, such as digital storytelling, comics, and videos yet to be explored.

- Many scholars in previous studies have identified collaboration as a critical component in creating digital multimodal composition tasks, as advocated by the New London Group's (1996) notion of collaboration as an act of *'co-engagement'* (p. 76).

- Professional growth may need to come before the intervention to be effective. As suggested by the pertinent professional development literature, this professional development would, therefore, need to be strongly linked to the instructors' subject-matter expertise and incorporated as part of engaged learning in the ESL context (Desimone, 2009; Garet *et al*., 2001).

- The most consequential aspect of these formative experiments needs to focus on instructors' perspectives and making such interventions a collaborative effort to support educational aims, especially in implementing such an intervention based on technology and writing. The suggestion aligns with the findings of (Yi *et al*., 2020), which aimed at expanding multimodality through genre into undergraduate studies in the ESL context.

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APPENDICES

Appendix A: Rubric for Visual Rubric

(Scoring Range 4-1): Derived from Visual Grammar (VG)

Criteria	Exceptional 4	Good 3	Satisfactory 2	Unacceptable 1
Colour	Colour choices are highly effective and enhance engagement and clarity.	Colour choices are appropriate and enhance the message.	Colour choices are limited or somewhat effective.	Colour choices are inappropriate or distracting.
Images/Graphics	Images/graphics are highly relevant and enhance the overall message.	Images/graphics are relevant and support the content well.	Some images/graphics are present but lack clarity or relevance.	Images/graphics are missing or irrelevant.
Font/Text	Font and Text are clear, easily viewed, and well-aligned.	Font and text are easily viewed.	The font and text are hard to identify.	Font and text are vague and unclear.
Design and Layout	The layout is exceptionally organised and engaging, enhancing understanding of the content.	The layout is clear and organised, guiding the viewer effectively.	The layout shows some organisation but lacks clarity.	The layout is disorganised and difficult to follow.
Multimodal Orchestration	Used relevant photos/graphics/tables/graphs to illustrate a point, and the text elaborated on the pictorial evidence using Google Sites. Excellent orchestration of multiple modes creates a highly engaging and cohesive message.	Photos, graphics, tables, and graphs were used to illustrate a point, and the text elaborated on the pictorial evidence using Google Sites. Good integration of various modes conveys a clear message.	Used irrelevant photos/graphics/tables/graphs to illustrate a point, and the text elaborated on the pictorial evidence using Google Sites. There is some integration of modes, but it lacks coherence.	The text did not use any photos, graphics, tables, or graphs to illustrate a point, and it elaborated on the pictorial evidence using Google Sites. Lacks integration of various modes; does not convey a cohesive message.

Appendix B: Interview Questionnaires

Semi-structured interview questionnaire from the instructors

i.   For how long have you been teaching writing courses?

ii.   What are your qualifications?

iii.   While designing your lessons, what goals do you set for yourself as a writing instructor?

iv.   How often do you engage your learners in writing activities in your class?

v.   What are your learners' strengths overall? What are their weaknesses?

vi.   How often do you use technology in your classroom? What types of technology do you use? Describe your comfort level with using technology in the classroom.

vii.   Can you describe your learners' familiarity with argumentative writing?

viii.   How much of learner writing relies solely upon text? How much do you encourage them to incorporate other modes, such as graphics?

ix.   Can you describe your learners' familiarity with using technology?

x.   What do you think about integrating technology in teaching academic writing?

xi.   Are there any challenges you foresee or encounter while integrating technology into teaching academic writing?

xii.   How do your learners respond to technology inclusion in their writing classes?

Focus group interview questionnaires from the learners.

a.   Once I have completed this multimodal composition project, what is my understanding of the term argumentative writing?

b. Would I be interested in creating related blogs for other projects in the future?

c. What advice do I have for other learners about to start their multimodal composition projects?

d. Do I consider writing a multimodal blog more complicated than drafting a paper?

e. What positive or negative experiences did I have during this multimodal composition project?

f. What problems did I face while creating this DMC?

g. Am I satisfied with the final product of my DMC?

h. What are the strongest points of my DMC?

i. What are the weakest points of my DMC?

j. What did I learn while creating my DMC project?

Semi-Structured Interview Questionnaire from the Writing Program Coordinator

i. What are your academic qualifications?

ii. How many years of coordinating experience do you have?

iii. What is your teaching background?

iv. What writing goals does your institution have for the writing curriculum?

v. How much is technology emphasised for learning in the university? How? Why?

vi. Is argument writing a priority in the academic curriculum?

vii. How does the administration support instructors' use of technology in the classroom?

viii. How does the administration support writing instruction in the classroom?

ix. What do you think about multimodal writing?

Appendix C: Informed Consent Form

Title of the Study: Digital Multimodal Composition in An English Language

Classroom: Pedagogy, Evaluation, and Practicum in Pakistan

Principal Investigator: Adeel Khalid

Supervisor: Prof. Dr. Fauzia Janjua

Purpose of the Study:

You are invited to participate in a research study to investigate how an intervention impacts student academics, the implementation of such an intervention to enhance student arguments in writing, and the causal relationship between genre pedagogy and DMC development in ESL writing performance.

The benefits of the research will be:
Participants in this study may better understand composing digital multimodal argumentative blogs using Google Sites.com and develop their digital literacy and competency.

Participant Requirements:
Participation in this study is limited to individuals 18 and older enrolled in their first year of an undergraduate program.

Risks and Discomforts:
There are no risks in participating in this study, nor will it affect students' academic grades/performance.

Confidentiality:
All the information on the study participants and interview responses will be kept confidential.

Voluntary Participation and Right to Withdraw:
Participation is voluntary, and the interviewee can withdraw at any time.

Contact Information:
This study was conducted as part of Mr Adeel Khalid's doctoral dissertation under the supervision of Dr. Fauzia Janjua, Dean of Languages and Literature at International Islamic University, Islamabad. Prof. Dr. Fauzia Janjua can be reached at fauzia.janjua@iiu.edu.pk.

If you have any questions about this study, don't hesitate to contact the Principal Investigator, Mr. Adeel Khalid, at adeel.phdeng145@iiu.edu.pk.

Thank you!

I voluntarily agree to participate in this research program.

o Yes

o No

I understand I will be given a copy of this signed Consent Form.

Name of Participant:

Signature: Date:

Appendix D: Weekly Distribution of Tasks Based on Instructional Stages of

Hyland's Genre Pedagogy

Stage 1: Building Knowledge (Week 1-4)
Week 1–2
A: The instructor activates learners' prior experiences with argumentation and technology use.
Introduces basic concepts of semiotic modes (text-flow, image-flow, page-flow) and their roles in argumentation and multimodal design. Introduces context of the situation (field, tenor, mode) and context of culture as influencing semiotic choices.
B: Learners reflect on their current skills in writing arguments and using technology for academic purposes.
Engage in activities exploring multimodal artefacts (e.g., infographics, websites) to identify how coherence and cohesion are achieved through GeM layers and semiotic modes.
Week 3–4
A: The instructor explains the GeM framework (base, navigation, layout, rhetorical layers).
Learners explore verbal-visual complementarity using Royce's intersemiotic framework in digital artefacts.
B: Learner's practice analysing multimodal artefacts using GeM layers, identifying cultural and situational contexts, and creating basic cohesion maps to consolidate understanding.

Stage 2: Modelling the Genre (Week 5–7)
Week 5
A: The instructor introduces academic argumentation structures through Toulmin's model and multimodal examples.
Learners explore digital resources for genre-specific writing based on personal interests.
B: Learners analyse academic publications and multimodal artefacts, focusing on text-flow and how it interacts with image-flow and page-flow.
Week 6
A: The instructor guides learners in analysing gathered resources using a genre knowledge framework (formal, rhetorical, process, and subject levels).
Introduces semiotic cohesion and coherence concepts using visual and verbal examples.
B: Learners collaboratively map rhetorical structures and identify inter-semiotic complementarity within multimodal texts.
Engage in discussions and create charts to visualise how GeM layers and semiotic modes interact.
Week 7
A: The instructor demonstrates cohesive and coherent multimodal writing through case studies (e.g., academic websites and digital articles).
Learners refine their understanding of argumentation and multimodal design principles.
B: Small group workshops analyse and deconstruct academic web pages and their semiotic resources.
Learners develop rough drafts of their multimodal artefacts, focusing on cohesion and intersemiotic synergy.

Stage 3: Joint Construction (Week 8-9)
Week 8
A: The instructor facilitates debating, analysing rhetorical structures, and using semiotic modes to create coherent arguments.
Demonstrates how to design multimodal artefacts using tools like Google Sites and cohesive layout principles.

B: Learners collaboratively construct knowledge frameworks that integrate text-flow, image-flow, and page-flow in argumentation.
Week 9
A: The instructor supports learners in co-creating persuasive multimodal texts (e.g., brochures or blogposts).
Reviews a visual rubric highlighting cohesion, coherence, and combining GeM layers and semiotic modes.
B: Learners create team-based persuasive projects, incorporating inter-semiotic complementarity, and publish their work using various semiotic resources.

Stage 4: Independent Construction (Week 10-12)
Week 10
A: The instructor assigns independent multimodal writing tasks, offering formative feedback aligned with a visual rubric.
Focuses on applying semiotic modes and ensuring coherence across GeM layers.
B: Using digital tools, learners independently develop drafts of multimodal artefacts, such as advocacy posters or interactive web pages.
Week 11–12
A: The instructor provides targeted support for finalising artefacts, focusing on audience alignment and rhetorical cohesion.
Facilitates reflective sessions on integrating the context of situation and culture into artefacts.
B: Learners finalise and present their multimodal artefacts, accompanied by reflective analyses addressing coherence, cohesion, and intersemiotic complementarity.

Appendix E: Sample Lesson Plan (Hyland's Genre Pedagogy – Joint Construction)

Course: Writing & Communication (Undergraduate)
Class size: 40 learners (10 groups x 4)
Mode: Digital Multimodal Composition (DMC) via Google Sites
Target: Textual and visual modes in blogposts according to the Toulmin Model (claim, data, warrant, counterargument, rebuttal).
Duration: 90 minutes
Stage of Genre Pedagogy: Joint Construction (instructor + learners co-construct a section of the model, and groups construct parallel sections)

Learning Outcomes

At the end of the session, the learners will be able to:

- Write blogs using the elements of Toulmin (claim, data, warrant, counterargument, rebuttal).
- Achieve the goal of strengthening claims and making them available by choosing and assigning Creative Commons-licensed visuals.
- Develop a multimodal blog page on Google Sites (linguistic/text, visual/spatial).
- Deliberately make decisions regarding genre, audience, purpose, and design using a rhetorical situation checklist.
- Assess blog bits created by peer review with an analytic mini rubric that is aligned to the multimodal design and Toulmin model.

Grouping & Roles (n=40)

Roles rotate session-to-session:
- Claim Architect: composes writing in Toulmin form.
- Visual Curator: edits images, sources, and verifies CC licensing.
- Layout Lead: headings, alt text, spacing, etc.
- Citations Lead: captions, in-text citation, references.

Materials & Technology

- Google Sites (shared class site with subpages per group OR subpages with shared links, per group)
- Projector + instructor computer
- Laptops/smartphones used by learners (Google accounts are required).
- Pre-prepared Google Sites skeleton template (title + section headings, blank image placeholders)
- Handout: Rhetorical Situation Checklist (Table)
- Reference slides: Toulmin's model
- Collection of sample CC-licensed visuals.

Lesson Sequence (90 minutes)

1. Warm-up & Context Building (10 min)
   - Classroom brainstorm: What is the secret of online argument?
   - Compare textual techniques (claims, evidence, rebuttals) vs. visual techniques (charts, memes, photos).
2. Modelling Toulmin in Context (15 min)
   - Instructor presents a piece of assertion (e.g., Universities should use hybrid learning instead of hybrid learning permanently).
   - Claim - Data - Warrant - Counterargument - Rebuttal map out, as a class.
   - Identify ways images can be used to back up or elaborate on text assertions.
3. Joint Construction of a Multimodal Section (35 min)
   - Parties write one brief paragraph (80-100 words: claim + evidence + warrant).
   - Choose 1-2 visuals (chart, infographic, image) in the given folder.
   - Insert text + visuals into Google Sites skeleton.
   - Design, mode integration, and ethical sourcing guided by Rhetorical Situation Checklist.
4. Sharing & Peer Feedback (20 min)
   - The groups project their sections on the screen.
   - A mini rubric is used by peers and comprises a claim, visuals, design, and compliance with Toulmin.
5. Reflection & Wrap-up (10 min)
   - Exit ticket: What was the design decision that your group made today, and what was your reasoning?
   - Instructor highlights strong examples of text-visual integration.

Rhetorical Situation Checklist

Dimension	Guiding Questions
Genre	What conventions (tone, voice, structure) fit an argumentative blogpost?
Context	How does this issue connect to campus/community debates? Why now?
Purpose	Is your goal to persuade, inform, evaluate, or a mix?
Audience	Who will read this (peers, faculty, wider community)? What appeals (logos, ethos, pathos) fit?
Modes & Semiotic Resources	Which modes (text and visuals) will you combine? How do they complement each other?
Design & Visual Literacy	Are you applying alignment, contrast, repetition, and proximity (ACRR) for clarity and persuasiveness?
Meaning-Making	How do text + visuals together create meaning beyond words alone?
Ethics & Accessibility	Are visuals ethically sourced (Creative Commons)? Are captions and alt-text included?

Assessment Tools: Mini rubric (10 pts per group)

- Toulmin element clarity (3 pts)
- Text–visual integration (3 pts)
- Design/visual literacy (2 pts)
- Ethical sourcing and accessibility (2 pts)

Appendix F: Institutional Review Board Approval

FORMAN CHRISTIAN COLLEGE
(A CHARTERED UNIVERSITY)

INSTITUTIONAL REVIEW BOARD
APPROVAL CERTIFICATE

IRB Ref: IRB-529/11-2023

Date: 16-11-2023

Project Title: Digital Multimodal Composition in An English Language Classroom: Pedagogy, Evaluation, and Practicum in Pakistan

Principal Investigator: Adeel Khalid

The Institutional Review Board has examined your project in the IRB meeting held on 16-11-2023 and has approved the proposed study. If during the conduct of your research any changes occur related to participant risk, study design, confidentiality or consent or any other change then IRB must be notified immediately.

Please be sure to include IRB reference number in all correspondence.

Dr. Sharoon Hanook
Convener – IRB
Chairperson, Department of Statistics
Forman Christian College
(A Chartered University)
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