Metadiscourse and Inferential Reasoning in L2 Argumentative Writing: An Investigation at UiTM

Shazan Khan Omar[1], Kesumawati Abu Bakar[2], Nor Fariza Mohd Nor[3]

The Centre for Research in Language and Linguistics, Universiti Kebangsaan Malaysia

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ABSTRACT

This study investigates the impact of a pedagogical intervention on B2-level L2 students' use of metadiscourse and inferential reasoning in argumentative writing at UiTM Shah Alam. A comparative qualitative design was employed, analysing 40 essays, comprising 20 pre-test and 20 post-test writings. Hyland's (2005) metadiscourse framework guided the evaluation of textual and interpersonal devices, while Facione's (1990) inferential reasoning model assessed students' ability to query evidence, consider alternatives, and draw justified conclusions. Importantly, findings indicate that the intervention enhanced students' awareness and use of metadiscourse and critical thinking strategies, supporting a transition from personal and descriptive writing to a more disciplined, reader-conscious style. Particularly, the post-test writings demonstrated increased engagement with readers, systematic reasoning, and adherence to academic conventions, reflecting improved argumentative skills. Pedagogically, the study underscores the importance of an explicit instruction in metadiscourse and inferential reasoning for developing critical thinking and academic writing competence. Incorporating such interventions into L2 curriculum can foster students' ability to construct coherent, persuasive, and academically aligned arguments, contributing to higher-quality learning outcomes and enhancing overall writing proficiency in higher education contexts.

Keywords: Argumentative, inferential reasoning, interpersonal, metadiscourse, pedagogy

INTRODUCTION

Developing students' argumentative skills is not possible without encouraging them to engage in activities that promote critical thinking and independent reasoning. For example, argumentative writing can be used to encourage students to write logical claims, support them with strong reasoning, and engage readers effectively. One key factor that supports these skills is metadiscourse, which allows writers to organize their text, signal their stance in reasoning, and interact with readers. According to Hyland (2005), metadiscourse includes elements such as stance; how writers express certainty or evaluation and engagement, how writers show interaction with readers. In essence, stance and engagement will help students not only to organise their writing but also express their ideas through justified and coherent reasoning. Likewise, effective argumentative writing mostly depends on critical thinking, which involves making inferences. Facione (1990) lists querying evidence, conjecturing alternatives, and drawing conclusions as essential inferential skills that underlie strong critical thinking.

Despite growing understanding of L2 (second language) textual organisation, knowledge of cohesion and other writing aspects in L2 texts remains limited (Crossley et al. 2016). For instance, the interaction between different types of metadiscourse and their impact on organizational quality is still underexamined (Liao, 2020). Furthermore, while writing necessitates cognitive strategies such as planning, monitoring, and assessing (Arndt, 1987; Qin & Zhang, 2019; Zhao & Liao, 2021), L2 organisational features are frequently studied in isolation. This lack of integration is especially evident in how organisational choices interact with metadiscourse and inferential reasoning in argumentative texts.

A Similar issue is also preliminary observed at Universiti Teknologi Mara (UiTM) Shah Alam Campus where students in this university particularly students with B1 language proficiency are less aware of the importance of metadiscourse and inferential reasoning in argumentative writing. As a result, their writing lacks textual organisation and justified claims. Thus, the aim of this study is to provide a pedagogical intervention which is a useful effort to understand students' awareness on the use of metadiscourse and critical thinking especially inferential reasoning in their argumentative texts.

Research question

What is the effect of pedagogical intervention on students use of metadiscourse and inferential reasoning in their argumentative writing?

LITERATURE REVIEW

This section briefly describes scholarly works related to the current studies by explaining the relationship between inferential reasoning and metadiscourse.

Critical Thinking through Inferential Reasoning

Tiara, Setyabudi, and Viktor (2018) perceive critical thinking to encompass not only the ability to think critically but it is also defined by meticulous analysis, contemplation and deliberation. Deliberation is essential for cultivating critical thinking, as it is fundamental to enhancing decision-making and judgment. In the same way, Wan Huraini and Junaidah (2021:1813) regard critical thinking as "an essential element of scientific inquiry and reasoning, serving as a tool to aid students in developing and refining scientific knowledge, and should be incorporated into scientific argumentation". In consequence, one way to develop critical thinking in students' argumentative writing is through inferential reasoning which includes identifying information and elements needed in order to come to a reasonable conclusion by making guesses or considering opinions and description about something (Facione 1990).

Metadiscourse links to Inferential Reasoning

Generally, metadiscourse plays a crucial role in helping readers make inferences about intended meanings, text organization, and argumentative reasoning (Tavakoli,Dabaghi, & Khorvash 2010). The term metadiscourse was first introduced by Harris (1959). It refers to language devices that are used to structure ideas rather than conveying them. For Vande Kopple (1985), metadiscourse is seen as both textual and interpersonal devices used to interact with readers and maintain writer presence in a text. Nevertheless, Crismore et al. (1993) further refined the concept by highlighting the importance of metadiscourse usage in pedagogical context to show how metadiscourse functions to help students make their writing reader friendly. Recently, Hyland (2005) reconceptualises metadiscourse as linguistics devices used to foreground a writer-reader interaction and becomes central in studies of students' academic writing.

Next, inferential reasoning is defined as the process of deriving a conclusion from a set of premises, including a conclusion that is probably in relation to the premises (McArthur, 1992: 15). In a similar manner, Paul and Elder (2011:110) view inferential reasoning as "a step of the mind, an intellectual act by which one concludes that something is true in the light of something else's being true or seeming to be true". In accordance with this, Facione (1990) holds the view that inferential reasoning is the ability to make conclusions based from logical premises. Thus, while inferential reasoning in Facione's (1990) framework describes the cognitive ability to draw logical conclusions from evidence, metadiscourse works as the linguistic mechanism through which these inferential processes are explicitly signalled and evaluated in academic writing.

THEORETICAL FRAMEWORK

This section presents two influential pedagogical models that underlie the theoretical framework of the current study as illustrated by Figure 1.0. The first component in the framework is metadiscourse developed by Hyland (2005). Hyland categorises metadiscourse into two resources which are stance and engagement. Stance is a linguistic device used by writers to express ideas effectively such as hedges (may, might, could etc.), boosters (clearly, definitely, in fact etc.), attitude markers (surprisingly, fortunately, unfortunately etc.) and self-mentions (I, we, my etc.) Conversely, engagement is linguistic resources used to interact with readers effectively such as reader positioning (you, your, it is important to note etc.) question (what similarity might the two share?, do you think it is true that? etc.) and reference to knowledge (see figure, in section 2, it is widely accepted etc.)

The second component of the diagram is inferential reasoning by Facione (1990). He further divides the inference into three categories. The first category is known as querying evidence. The aim of querying evidence is to recognise premises which needs a support. For example: ''when *attempting to develop a persuasive argument in support of one's opinion, to judge what background information it would be useful to have and to develop a plan which will yield a clear answer as to whether or not such information is available''* (Facione 1990:10)

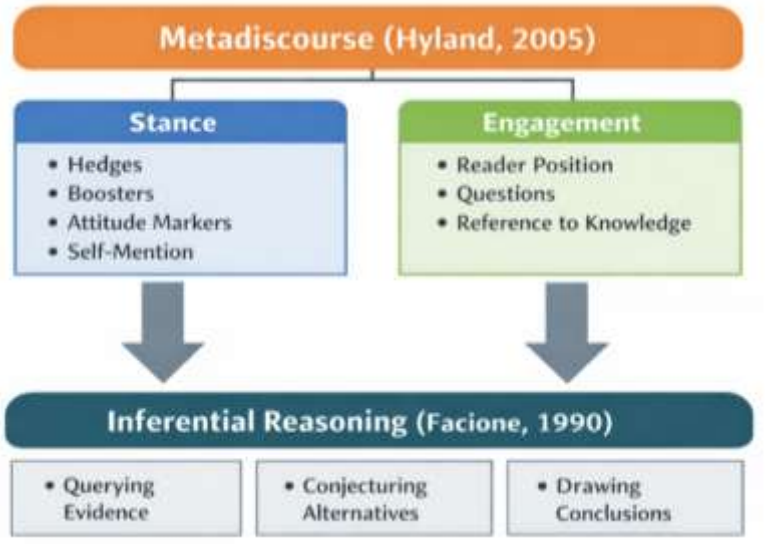

Fig. 1.0 Theoretical framework of the study

Secondly, conjecturing alternatives involve formulating multiple alternatives in resolving a problem: For example*: ''given a problem with technical, ethical or budgetary ramifications, to develop a set of options for addressing and resolving that problem; given a set of priorities with which one may or may not agree, to project the difficulties and the benefits which are likely to result if those priorities are adopted in decision making.''* (Facione 1990:11). Finally, drawing conclusions is used to apply appropriate inference in determining what position or viewpoint a person should take on a given issue. For instance: '' *to carry out experiments and to apply appropriate statistical inference techniques in order to confirm or disconfirm an empirical hypothesis* (Facione 1990:11).

METHODOLOGY

This section provides a brief overview of the methodology used in the present study by describing research design and sample, data collection as well as data analysis.

Research Design and Sample

This study utilises a qualitative comparative design. The research targeted 40 argumentative essays composed by L2 students as part of their coursework in a writing course at UiTM Shah Alam Campus. The participants were first-semester undergraduates who were still developing foundational academic writing skills. They were selected using purposive sampling based on predetermined criteria, namely being first-year students and having a B2 level of English proficiency. The study targeted 40 argumentative essays because this number provided a manageable dataset for a qualitative analysis to identify patterns in students' use of metadiscourse and inferential reasoning. Nevertheless, the methodology has certain limitations, including the small sample size and the focus on a single institution, which may affect the generalisability of the findings.

Data Collection

Students' argumentative writings were collected based on two separate tests. The test was divided into two: pre-test (20 samples) and post-test (20 samples). During a pre-test, students were required to write an argumentative writing 'on social media'. After they completed the pre-test students were given a 3 week- lecture with tutorials on the use of metadiscourse (Hyland 2005) and inferential reasoning (Facione 1990). To find out students' understanding on the use of metadiscourse and inferential reasoning, a post test was conducted where students were required to write another argumentative writing on 'plagiarism'.

Data Analysis

Upon completion of the writing intervention, data from both the pre-test and post-test were analysed using descriptive analysis. For instance, the analysis includes coding for Hyland metadiscourse (2005) ; stance and engagement and Facione's (1990) inferential reasoning. Each instance was identified and compared across pre-test and post-test to determine how the students' ability to write inference and use metadiscourse in writing evolve. On one hand, for metadiscourse, the essays were coded for stance markers (hedges, boosters, attitude markers and self-mentions) and engagement markers (reader positioning, questions, and references to knowledge). On the other hand, for inferential reasoning the writing was coded based on querying evidence, conjecturing alternative and drawing conclusion.

FINDINGS & DISCUSSION

This section discusses the findings of the present study based on the students use of metadiscourse and inferential reasoning both in the pre-test and post-test.

Metadiscourse: Hedges and Boosters in Argumentative Writing

Figure 3.0 shows how students employed stance and engagement markers as proposed by Hyland (2005) in his metadiscourse framework. For example, in the pre-test, students' claims exhibit absolute certainty, with no use of hedges, as exemplified by the statement "There is simply no question as to whether social media can affect our lives." Such an absolute assertion reflects a limited awareness of the need to qualify claims in academic argumentation, which may reduce the credibility of the argument (Salager-Meyer, 1994). In contrast, the post-test shows more strategic use of hedges**,** such as "may point the finger at other possible factors" and "even if it's not the only cause," which serve to acknowledge alternative explanations and avoid overgeneralisation. Hedging in this way demonstrates greater writer awareness of stance-taking and audience engagement, allowing claims to be both assertive and cautious where necessary (Vande Kopple, 1985; Biber et al., 1999).

With regard to the use of boosters, they were employed in the post-test in the phrases such as "does indeed negatively impact" and "will no doubt continue to plague students' overall academic performance". This indicates that the writer attempted to strengthen his/her argument using words like 'indeed' and 'will no doubt'. Such instances are in line with Lee and Ang (2024) where they assert that in academic writing, boosters are linguistic items used not just to state opinions but to put forward important information, reinforce the significance of claims, and signal certainty and confidence in arguments. Furthermore, boosters are also present in the pre-test but they were more frequently used as sweeping certitude rather certainty as illustrated by the phrase "We as a society would crumble without their existence''. Hence, the effective use of boosters contributes to argumentative clarity by highlighting central ideas, ensuring that the reader recognises their importance within the overall structure of the argument (Hyland, 2019)

Reflecting Attitudinal Positioning through Metadiscourse

Another metadiscourse identified in the present study is attitude markers**,** which writers use to express evaluation, judgment, and personal viewpoints toward the subject matter. Through evaluative lexis, writers can reveal their stance and attitudinal positioning rather than merely presenting neutral standpoints. For instance, phrases such as *"severe consequences"* and *"significant one"* in the post-test reflect the writers' evaluative perspective on plagiarism, signalling a negative judgment and heightened seriousness of the issue. Similarly, the phrase *"huge part of our lives"* in the pre-test represents a positive evaluation of social media, indicating its importance in everyday life. Utilising this evaluative language aligns with studies on stance and appraisal, which emphasise that attitude markers function to encode writers' feelings, values, and assessments, thereby shaping how readers interpret the argument (Biber et al., 1999; Martin & White, 2005)

METADISCOURSE	PRE-TEST	POST-TEST
STANCE		
HEDGES	None; pre-test claims are absolute: "There is simply no question as to whether social media can affect our lives.	"may point the finger at other possible factors"; "even if it's not the only cause"
BOOSTERS	Sweeping certainty: "We as a society would crumble without their existence	"does indeed negatively impact"; "will no doubt continue to plague students' overall academic performance"
ATTITUDE MARKES	Informal evaluations: "huge part of our lives"; "easy to see why	"severe consequences"; "significant one"; "serious manner"
SELF MENTION	Personal experience: "I use on a daily basis"	"My response to that is…"
ENGAGEMENT		
READER POSITIONING	Writer-centered narrative: "Facebook, Whatsapp, Instagram, Discord just to name a few are just some of the social media platforms I use on a daily basis	Implicit reader inclusion: "what happens if they never get caught?
REFERENCE TO KNOWLEDGE	Observational personal knowledge: "Mark Zuckerberg himself admitted that he designed apps like Facebook based on exploiting the chemistry of the human brain"	"It is not only frowned upon in most institutions"

Fig. 3.0 Findings based on metadiscourse

In addition, the post-test demonstrates the usage of self-mentions as a rhetorical device, as seen in lines such as *"My response to that is…"*, which indicate the author's active presence and stance in the argument. This matches what research has shown that self-mentions help writers project authority, engage readers, and clarify writers' position in academic discourse (Hyland & Tse, 2004). Conversely, writers in the pre-test predominantly employed self-reference language to convey personal experience as exemplified by *"I use on a daily basis"*, reflecting a more narrative or experiential orientation rather than a strategic argumentative stance (Coffin, 2006). These differences suggest a developmental shift in students' awareness of how to position themselves rhetorically in argumentative writing.

Next, students also utilised both question and reader positioning in the post-test as seen in *"What happens if they never get caught?"*. The phrase not only prompts readers to think and reflect but it also attempts to include readers as active participants in evaluating the argument. Additionally, a statement such as *"It is not only disapproved of in most institutions"* in the post-test, provides references to shared knowledge, reinforcing the writer's claim (Salager-Meyer, 1994). In this regard, the findings are in accord with Martin and White (2005) where such usage helps writers guide interpretation, establish authority, and create interaction between writer and audience. However, it is worthy to note that the pre-test essays predominantly centre on the writer and are descriptive in nature. This shift indicates a transition from a personal, narrative-oriented style to a more disciplined, reader-conscious approach**,** reflecting greater awareness of audience, purpose, and rhetorical strategy in writing (Swales & Feak, 2012).

	PRE-TEST	**POST-TEST**
QUERYING EVIDENCE	''No querying of evidence; descriptive statement: "Our profiles online are an inverted mirror of what we truly are in real life"	"Due to the fact that plagiarism literally only involves stealing another person's work, this will severely limit their academic abilities including research, perseverance, and overall critical thinking"
CONJECTURING ALTERNATIVE	No alternatives considered	"even if it's not the only cause, it's still a significant one that will no doubt continue to plague students' overall academic performance"
DRAWING CONCLUSION	''Pre-test statements are descriptive or opinion-based: "Social media is no longer a tool for passing time by scrolling through our feeds on Instagram"	"Plagiarism severely limits one's overall independence and overall abilities thus proving that it does indeed negatively impact student's overall performance"

Fig. 3.1 Findings based on inferential reasoning

Inferential Reasoning in Writing Argument: Querying Evidence

Figure 3.1 represents the analysis of students' argumentative writing based on Facione's inferential reasoning. Inferential reasoning is important for students' writing because it allows them to interpret evidence, make logical connections, and draw justified conclusions**.** Consequently, mastery of this skill helps students to have deeper understanding and more effective problem-solving and decision-making (Halpern, 1998; Fisher & Scriven, 1997; Kuhn, 1999; Paul & Elder, 2006).

The first category of inferential reasoning is querying evidence as formulated in this post-test sentence: "Due to the fact that plagiarism literally only involves stealing another person's work, this will severely limit their academic abilities, including research, perseverance, and overall critical thinking,". In the above statement, the writer initially offered a claim by stating what is considered plagiarism. Then, the writer provided reasons by saying plagiarism affects research skills, perseverance, and critical thinking to support the claim. By doing this, the writer queried the evidence by asking, "Why is this true?" and gave a logical support. This inference process shows a structured evaluation to support claims, in tandem with Facione's (1990) definition of querying evidence. Nonetheless, information in the pre-test only presents a descriptive assertion devoid of evidence-based rationale, such as "Our online profiles serve as an inverted reflection of our true selves in reality." This signals that students in the pre-test were less aware of the use of inferential reasoning in argumentative writing. It is due to the fact that their statements were mostly based on observations or opinions rather than a reasoned analysis (Facione, 1990; Ennis, 2011).

Conjecturing Alternative in Students' Argument

The second type of inferential reasoning observed in the post-test is conjecturing alternatives, where the writers recognised that plagiarism may not be the sole cause of inadequate academic achievement. This is illustrated by the statement, *"Although it may not be the main cause, it remains a substantial reason that will undoubtedly affect students'*

overall academic performance,". The statement implies an awareness of multiple contributing factors towards the issue. In argumentation theory, the ability to consider alternative causes and counter-positions is seen as essential for sound reasoning, as it helps writers evaluate the strength of claims and avoid fallacious or overly simplistic conclusions (Toulmin, 2003; Walton, 2006). In contrast, writers' responses in the pre-test did not provide any alternative reasoning. The findings in the pre-tests suggests that students may have limited ability to consider multiple causal factors and nuanced explanations**,** a skill linked to advanced critical thinking and reasoning development (Kuhn, 2005; Paul & Elder, 2006).

Drawing Conclusion: Subjective to Evidence-based Inquiry

The final inferential reasoning identified in this investigation is the ability to draw conclusions. In the post-test, for instance, students in general were able to synthesise arguments into a coherent statement while projecting clear viewpoints, such as: "Plagiarism severely limits one's overall independence and overall abilities thus proving that it does indeed negatively impact student's overall performance". The student's reasoning reflects an understanding of inference as defined by Facione (1990), where appropriate logical forms are employed to derive a justified conclusion

Conversely, the information gathered in the pre-test was primarily descriptive, often relying on personal observations or opinion-based conclusions rather than structured analysis. A typical example of this is the statement that "social media is no longer merely a means of passing time by scrolling through our Instagram feeds," This language usage is often characteristic of a knowledge-telling phase (Scardamalia & Bereiter, 1987), where writers share what they know from experience without incorporating their own critical viewpoints or evaluating the broader implications of the information.

CONCLUSION

The present study was designed to determine the effect of pedagogical intervention on students' use of metadiscourse and inferential reasoning in their argumentative writing. The findings of this investigation show a significant use of engagement markers in the post-test in comparison to the pre-test. For example, it is evident that boosters are frequently used in the post-test to emphasise claims which include: ''does indeed negatively impact" and "will no doubt continue to plague students' overall academic performance''. The usage of such elements in the argumentative writing reflect greater use of emphatic lexical items such as 'indeed', and 'will no doubt' Additionally, the use of attitude markers, self – mentions indicate that students become more aware of their voice which reflect their writing authority in pointing out their opinions in argumentative texts.

The most obvious findings to emerge from this study is that students show a substantial use of inference in the post-test which indicates a clear progression from opinion based statement to analytical- based reasoning through the usage of querying evidence, conjecturing alternatives and drawing conclusion. For example, while the in the pre-test students' essays merely contain description assertions, the use of querying evidence in the post test shows effective use of inference which displays a structured thinking process consistent with Facione's (1990).

Notably, the findings reported here shed new light on how targeted instruction influences students' use of metadiscourse and inference when constructing argumentative texts. The post-test findings also showed that students developed a clearer stance, engaged more effectively with their audience, and employed more systematic reasoning. Future research should examine the long-term effects of targeted instruction on students' use of metadiscourse and critical thinking across different genres and proficiency levels. Incorporating larger samples and mixed-method approaches may provide deeper insight into how these skills transfer to authentic academic writing contexts.

More importantly, the observed differences between the pre-test and post-test further suggest that explicit instruction plays a crucial role in helping learners internalise both metadiscourse and inferential strategies. By learning how to employ stance and engagement markers alongside evidence-based reasoning, students appear better equipped to structure arguments, justify claims, and anticipate readers' expectations. This integration of metadiscourse and critical thinking reflects a more sophisticated level of academic writing competence. Despite these positive outcomes, the findings are limited to short-term instructional effects within a specific context.

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