

CHAPTER II

LITERATURE REVIEWS

2.1 Theoretical Reviews

2.1.1 Writing

Writing is an activity of expressing one's idea, feeling, experience in the form of written form. To be able to write, one needs knowledge and skills of writing. Therefore, practice often is a must. There are many reasons to write; the most important one is to disseminate information and knowledge to the public. Another reason for writing is to record the knowledge for a longer period for the sake of future research. The ability of writing is influenced by one's psychological condition, critical thinking, and knowledge background of the writer. These aspects will result in the difference in the writing quality of the author (Suwarno, 2022, p. 4).

The source of writing is knowledge, and, knowledge can be obtained from reading. The habit of reading needs to be nurtured from childhood. The habit of reading will teach one to synthesize, analyze, produce, and assimilate all sources of reading (Suwarno, 2022, p. 5). The activity of writing will be challenging if one has no idea of what to write. Those who read a lot will have more ideas to write. Therefore, reading and writing are intermingled activities that need to be trained and practiced often. Reading can also mean thinking critically about what is observable through our environment. Allah has created this universe for humankind to think and investigate to find the truth of what happens. That is why Allah swear that if men write Allah's creation, there will never be enough pen and ink such as written in Q.S 31:27 (Kementerian Agama Republik Indonesia, 2022)

وَلَوْ أَنَّ مَا فِي الْأَرْضِ مِنْ شَجَرَةٍ أَقْلَامٌ وَالْبَحْرُ يَمُدُّهُ مِنْ بَعْدِهِ سَبْعَةُ أَبْحُرٍ مَا نَفِدَتْ كَلِمَاتُ

اللَّهِ إِنَّ اللَّهَ عَزِيزٌ حَكِيمٌ

Meaning :

And if the trees of the earth were pens and the seas (ink) were added to it seven seas (again) after (drying) them, surely Allah's words would not be exhausted. Verily Allah is Mighty, Wise.

This surah implies that if one wants to think critically about the nature Allah has created, he/she will find that there are never-ended sources of research that can be investigated. As the above-mentioned ayah suggests that there will never be enough ink to write Allah's creation. It encourages men to continuously think and do research to seek the truth and produce knowledge for the sake of humankind. Potter (2006) maintains that writing is an activity of developing ideas that began by researching, observing, and reading the phenomena.

The purposes of students' writing in higher education are assessment, learning, and entering particular disciplinary communities (Rabl, 2019, p. 2). The assessment purposes applied when students are required to write an essay as part of testing their mastery of learning, or a report of their laboratory activities. This kind of teaching is focused on the content the form of writing. The learning purpose of students' writing is when students are asked to write the text that traces their reflection on the learning process. One form of this kind of purpose is writing journals where students record their thoughts, questions, problems, and ideas about what they read and learn or practice. Writing for entering particular disciplinary communities is usually used when students want to further their studies to the next level of education. In this case, writing is part of the entrance test as to writing essays for higher education.

2.1.2 Scientific Writing

Writing scientific papers requires critical thinking skill. This means that one must consider what he/she is going to write, especially in writing a research paper. A written work must be accountable. One must be responsible for what he/she is writing. Therefore, an author

must adopt rules and ethics in writing. One must have honesty, respect for other researchers, as well as trust in their scientific writing since their writing must be accountable. This conforms with Q.S 43:19 (Kementerian Agama Republik Indonesia, 2022) as the following:

وَجَعَلُوا الْمَلَائِكَةَ الَّذِينَ هُمْ عِبْدُ الرَّحْمَنِ إِنَانَّ أَشْهَدُوا خَلَقَهُمْ سَنُكْتَبُ شَهَادَتَهُمْ وَيُسْأَلُونَ

Meaning:

And they made the angels of the Most Merciful (Allah) slaves as types of women. Did they witness the creation of (the angels)? Later their testimonies will be written and they will be held accountable.

This verse implies that Allah will record all human deeds and will ask for their responsibility of what they did. If they do badly and irresponsible, Allah will penalize them; but if they do good deeds Allah will reward them. There is no use to hide since Allah knows every single thing. Honesty is the most important thing in every aspect of life, writing is no exception.

Authors have a responsibility to create a publication that is accurate and genuine to the study results; and, authors must also provide a substantial contribution and are accountable for that contribution. Contributions made by authors should be fully described in the publication, to enable the reader to assess credit and responsibility (Stocks et al., 2018).

There are many forms of scientific writing varying from class essays, school laboratory reports, research reports, books, journal articles, and thesis. Unlike the other forms of scientific writings, the last mentioned is a compulsory final assignment for students who will finish their studies in higher education. Although there are many terms used to refer to this kind of writing including final assignment, final report, scientific papers, thesis, dissertation, and so on, the essence is research report (Jubilee Enterprise, 2020). Other research conveys that scholarly writing may take forms of peer reviewed journal articles, scholarly books, and book chapter (Collins & Cook, 2017).

In science writing the tone is generally formal, objective, and informative (Crosby et al., 2015). Scientific writing, like all formal writing, requires a firm foundation in English sentence construction, usage, and punctuation. Writing for any discipline involves a cycle (or multiple cycles) that includes (1) planning, which encompasses locating and reading source materials; (2) writing a rough draft; and (3) editing and proofreading. Writers aim for continuity and a logical flow of ideas. In scientific writing, all ideas must be supported by evidence, with appropriate citations of the source of the evidence (Rashid, 2018). Using the English language to successfully communicate scientific findings does not come easily to most people.

Scientific writing in higher education should be an integral part of learning. However, the skills of academic writing are often ignored in the curriculum so that students receive minimum knowledge and practice in academic writing. Rules that are involved in academic writing, including ethics, are less taught to students explicitly (Rabl, 2019, p. 3). This condition leads to violation of ethics such as plagiarism done by students in their academic writings. Lecturers always assume that students already have knowledge and skills in academic writing.

Writing for research requires an understanding of the process of writing and the systematic method in the structure of writing. Academic writing is a formal and extremely organized style of writing necessitating the capability of formulating an argument, writing critically, providing supporting evidence, and developing new ideas (Tian & Low, 2012). The process of writing starts from the development of ideas. Ideas can only come from a lot of readings. One cannot have an idea if he/she lacks reading. Writing for research needs a prior reading of previous research, be it in the form of monograph or journal publications. Reading is a key resource constraint on the development of efficient writing and a critical functional part of the writing process itself.

There are many approaches to writing development. McCardle et al. (2021) cited two models of writing; the first is a sensitive cognitive model and the second is a resource model.

The first includes three major, very interactive yet parallel levels: resource (including attention, working memory, long-term memory, and reading skill), process, and control, all inhibited by difficulty level (Hayes & Berninger, 2014). The second constitute resources that are more social and interpersonal, highlighting the teacher' and the teacher-student relationship in the context of knowledge construction, and where levels of difficulty will depend on individual differences and change over time with development (Bernstein, 2000).

There are characteristics of scientific writing. Suwarno (2022) proposes nine indicators of what constitutes scientific writing, they are:

1. Scientific writing denotes the use of reference to theoretical background of study being discussed as the framework of thought and tool of analysis.
2. Scientific writing must be based on factual phenomenon, objective, and concrete
3. Scientific writing must be constructed in logical structure and rational. Every statement must be based on evidence.
4. Scientific writing must be objective and impersonal
5. Scientific writing must be structured systematically according to acceptable and agreed standards and procedure
6. Scientific writing must use valid methods so the finding can be tested and measurable.
7. Scientific writing must use formal language and clear arguments that will not result in misunderstanding and ambiguity.
8. Scientific writing must be thoughtful and full of consideration. Author must be careful of expressing ideas and draw conclusion
9. Scientific writing must be conducted completely and focused on specific subject of research.

Meanwhile, Bailey (2003) maintains that scientific writing must sound academic which include rules including:

1. No use of idiomatic or colloquial vocabulary
2. The use of accurate vocabulary
3. Write precisely when dealing with facts or figure
4. Use of tentative language in conclusion
5. Avoid adverbs that show personal attitude such as: luckily, surprisingly, etc.
6. No contraction of verb forms
7. Avoidance passive voice as maximum as possible
8. No use of question forms, such as where, when, what, how.
9. Avoidance in numbering section
10. Preference of the use of simple word to verbal phrase.

The ability of writing is a tool for a researcher that need to be sharpened. The capacity to communicate in writing inquire about discoveries in an interesting — even memorable way that add the probability of consideration which will be respected as critical commitment to the information base of the field (Zach, 2022).

The benefits of scientific writing is mainly to disseminate new knowledge or well known as ‘knowledge sharing’ (Suwarno, 2022). The dissemination of knowledge can be in any form of publication in journals, books, seminar, conference or as simple as discussion forum or mass media. Through scientific writing one can develop networking with community of the same interest. For students, scientific writing can increase their academic performance and fulfill their graduate requirement. For lecturers and researchers, scientific writing, when published, can be a tool for professional promotion to upgrade their level of academic position. Published scientific writing in electronic media, especially in the reputable international journals, will increase professional acknowledgement and self-esteem. Knowledge sharing through publication is highly appreciated in academic world. Published articles do not only benefit the author, but also contributes to the institutional reputation. In short, knowledge sharing will

increase personal and institutional standing. Allah has confirmed this in the Q.S al Mujadalah (58) :11 (Kementerian Agama Republik Indonesia, 2022) as the following:

يَا أَيُّهَا الَّذِينَ آمَنُوا إِذَا قِيلَ لَكُمْ تَفَسَّحُوا فِي الْمَجَالِسِ فَافْسَحُوا يَفْسَحِ اللَّهُ لَكُمْ وَإِذَا قِيلَ انشُرُوا فَاَنْشُرُوا يَرْفَعِ اللَّهُ الَّذِينَ آمَنُوا مِنْكُمْ وَالَّذِينَ أُوتُوا الْعِلْمَ دَرَجَاتٍ وَاللَّهُ بِمَا تَعْمَلُونَ خَبِيرٌ

Meaning:

O believers! When you are told to make room in gatherings, then do so. Allah will make room for you 'in His grace'. And if you are told to rise, then do so. Allah will **elevate** those of you who are faithful, and 'raise' those gifted with knowledge in rank. And Allah is All-Aware of what you do.

This ayah suggests that scientific writing that produces knowledge should be disseminated widely through publication for the benefit of all humankind. There are values in wide publication of scientific papers, they are: rationality, intelligence, balance between heart and intellectual insights, and, work or technical ability (Sayekti, 2021). Moslems as followers of the prophet Mohammad are encouraged to be '*rahmatan lil 'alamin*' or a mercy for the whole world as suggested by the Q.S. Al-Anbya' (21) : 107 (Kementerian Agama Republik Indonesia, 2022)

وَمَا أَرْسَلْنَاكَ إِلَّا رَحْمَةً لِّلْعَالَمِينَ
UNIVERSITAS ISLAM NEGERI
SUMATERA UTARA ME

Meaning:

We have sent you 'O Prophet' only as a mercy for the whole world.

When applied in scientific writing, this ayah implies that through publishing scientific works, one – especially a Moslem – can dedicate his works for humanity. Only when he publishes his writing, does he show his visibility and contribution to the expansion of knowledge.

Da Lopes and Renoat (2015) state that the purposes of scientific writing are:

1. To exercise the ability of expressing ideas systematically and methodologically
2. To build a critical thinking tradition encouraging one to produce information or knowledge
3. To disseminate knowledge to community
4. To train skills in conducting research.

Suwarno (2022) suggests some steps in writing; 1) finding idea, 2) mind mapping, 3) drafting, 4) action, and, 5) read and edit. Finding idea is the first step in initiating writing. Idea can be obtained from reading, searching for information, experience, and phenomena. By the development of technology, Internet has been the most useful tool to search for information and gain idea to write. The second step is mind mapping. It is the skill of making category and classification of topic to write. Drafting as the third step of writing, is the activity of planning what he or she is going to write. In this step an author begins jotting down ideas into words and put them in a systematic order. The fourth step connotes taking real action of composing words and developing paragraphs to expand the ideas that make a full essay. Finally, read and edit - mean that an author needs to re-read what he or she wrote and make edit when necessary. This activity aims to ensure that the writing is conforming to the rules, procedure, and ethics. It is in this last but not least step that an author check for accuracy and technical issues dealing with spelling, punctuation, and so on.

Writing a scientific paper has commonly known standard called IMRAD. It stands for introduction, method or materials, result, and discussion. In general, the order of scientific paper follows the following stereotype:

1. Title
2. Author or complete identification of the author
3. Abstract
4. Introduction

5. Literature review
6. Method
7. Result
8. Discussion, and
9. Conclusion

However, when one wants to write a scientific paper, he or she must follow the following steps:

1. Materials and methods
2. Results
3. Discussion
4. Conclusion
5. Introduction
6. Title and abstract (Kattz, 2006, p. 53)

According to Katz (2006), the procedure above will ease authors to write articles which is a concise form of research paper, for publication. This procedure is based on the idea that the most important parts of the research to be presented on the article are the result and discussion. Once authors have materials and methods, followed by result of the research, the rest will follow.

2.1.3 Use of English in Scientific Resources

Scientific writing requires some resources for reference. The use of resources in scientific writing is not only to illuminate the evidences that have been done before, but also to strengthen the position of the current research being conducted. In addition, the reference also function as means to view the width of scope of study from other researches. This is what is famously called 'standing on the shoulder of Giant'. This slogan was initially derived from the

statement of sir Isaac Newton in his letter to Robert Hooke in 1675 saying “If I have seen further It is by standing upon the shoulders of Giants” (Wheeler, 1987).

Writing research is like standing on the shoulders of Giants. This term is very popular in science that Google formally use it in its search engine for Google Scholar (<https://scholar.google.com/>) as pictured below:

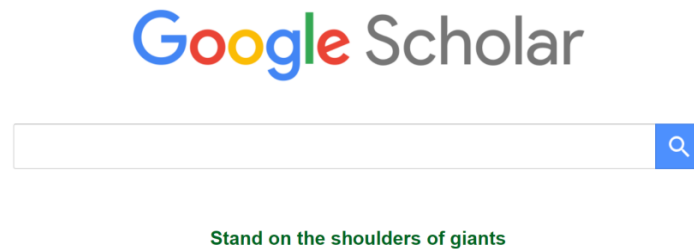


Figure 2. 1 Standing on the shoulders of Giants

This uttering means that research must be conducted comprehensively by building new knowledge on the basis of other studies that have been done earlier. Many researchers use this term to apply in various topic of publication (Burton, 2005; Corbett, 2012; Klein, 2017; Romanovsky, 2014; Snee, 2019; Van Puyvelde & Curtis, 2016). The use of research that are already published in journals can be a challenge for some students. Not only is the searching of the article difficult, but also the understanding of the content can cause problems. For non-English speakers, or commonly known as L2 users, skill in reading and comprehension is imperative to consume the information written in English. One cannot write without reading. That is why in Q.S. al ‘Alaq verses 1 – 5 (Kementerian Agama Republik Indonesia, 2022) Allah suggests the following:

إِقْرَأْ بِاسْمِ رَبِّكَ الَّذِي خَلَقَ ۝ ۱ خَلَقَ الْإِنْسَانَ مِنْ عَلَقٍ ۝ ۲ اقْرَأْ وَرَبُّكَ الْأَكْرَمُ ۝ ۳ الَّذِي عَلَّمَ بِالْقَلَمِ ۝ ۴ عَلَّمَ الْإِنْسَانَ مَا لَمْ يَعْلَمْ ۝ ۵

Meaning:

Read, 'O Prophet,' in the Name of your Lord Who created. Created humans from a clinging clot. Read! And your Lord is the Most Generous. Who taught by the pen. Taught humanity what they knew not (<https://quran.com/96>).

From these verses we learn that Allah commands men to read (اِقْرَأْ) before writing (الَّذِي عَلَّمَ بِالْقَلَمِ). This implies that reading is the first and the most important stage to conduct writing because it is a method to understand sources to get the ideas. One who wants to write must firstly read many sources to get the idea and understand the context. Collecting appropriate resources for reading is, therefore, significant to determine how one constructs the ideas and put them into writing.

Many scientific reading resources are written in English. English has been the most dominant language used in today's world. It is known as the language of science (Wranglén, 1975). Research shows that 90 % of published research articles in journals uses English language (Albarillo, 2014). Claimed to be the most commonly used international language, English use continues to grow with the growth of scholarly communication publishing. Although there are more writers emerging from non-English speaking countries, be it in the field of natural science or social sciences, the popularity of English has never been affected and remains the top language used in international publication. The popularity of English in scientific publication has a root in the fact that it is the most widely used language in speaking. Statistics show that English is the most spoken language worldwide in 2022 as presented in the Figure 2.2 below.

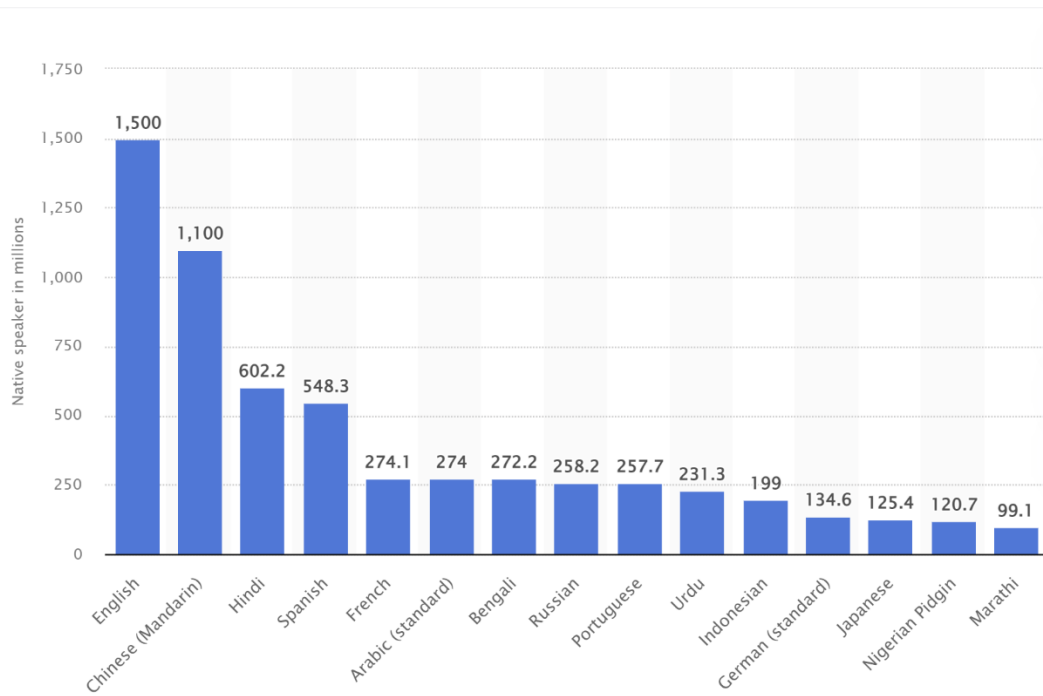


Figure 2. 2 Most Spoken Language Worldwide in 2022

Source: <https://www.statista.com/statistics/266808/the-most-spoken-languages-worldwide/>

Although this data presents the use of English in spoken language, it implies its correlation with the use of English in scientific resources in publications. In a study that compares between two journal databases, Scopus and JSTOR, English is still positioned in the first rank and proved to be raising, although it is hard to determine factors that affect the increase (Albarillo, 2014). When English is declared to be one of the languages of United Nations (<https://www.un.org/en/our-work/official-languages>), international journals require English be the main language for publication. Therefore, it is understood that there are many articles written in English. Even, many nationally accredited journals (Sinta 1 and Sinta 2) require authors to use English for their submitted articles. English is inevitable. Students have to learn English and understand spoken or written English. Unfortunately, although English has been taught from the basic education until the higher education level, many students are still facing problems in comprehending English texts. To overcome the problems, Rabl (2019)

maintains that non-English speaking students can work with their subject lecturers to make familiar with English texts and easily understand them.

Researchers may read many articles that are relevant to their research topic; however, they only cite those which are really close to their specific topic. Therefore, reading and citation have relationship but both are different activities (De Silva & Vance, 2017).

2.1.4 Skills in Searching Scientific Resources

Finding resources for reference in scientific writing needs skills. These skills, however, are less taught in classrooms, not even in the university where students are borne with a bulk of scientific reports. Lecturers often assume that students will know by themselves how to write scientifically using references that support their writings. More often than not lecturers assigned students to find as many articles as possible for their essay without ever teaching them how and where to search for resources. Students are left alone to learn themselves the strategy and sources of searching for information. As a result, many students are stuck and even trapped into the jungle of information with no ability in selecting the accurate information from the trash.

There is a huge range of help for students as scholars on the Internet, and there are various manners by which Internet-based assets can be utilized (Bailey, 2003, p. 134). However, the use of information taken from the Internet necessitates knowledge of analysis the resources. Students need to be critical of the information they search on the Internet. They need to question the source of information provided on the Internet, the status, the author, as well as the purpose of writing. Many libraries provide guidelines to search the Internet using search engines, such as Google (<https://www.google.com/>). Some strategies are offered to use when searching information. Librarians are information professionals that students can refer to when using libraries. They are trained to use their knowledge and skills in searching information to

help users to find academic resources. With some guidance and practice, student can become adept at integrating information found on the internet into their writing.

The research process is a complex combination of thinking, searching, reading, evaluating, writing, and revising (Perrin, 2012, p. 1). Thinking critically is the core skill that a researcher must have since the whole process of research, from determining the subject, jotting down the idea into paper, defining the theoretical references, analyzing the data, as well as drawing the conclusion and implication, requires the competence of critical thinking. This competence, however, is not brought from the birth; instead, it is learned and practiced. In today's technological development, the competence of critical thinking is a must for educated individuals, students of higher education are of no exception. Students need to be able to select information and evaluate the quality of it before they use. To overcome critical thinking barriers research suggests that individual needs to have a self-leadership skills and improve electronic learning style (Durnali, 2022).

During the development of writing, students need to read many sources of information be they books or journal articles to support their ideas. The information may come from various sources that might be available offline as well as online. Therefore, students have to be able to locate, select, evaluate and use of information. To foster these skills, students may consult with information professionals such as librarians to learn how to conduct information search independently. Little students are exposed with the information literacy instruction by librarians. In many cases, this professionals are ignored as important individuals who play significant role in improving students' learning in higher education. In fact providing information literacy instruction is part of their everyday duties .

According to Hepworth (2009) there are four areas of information literacy that students of higher education must be able of. Those areas are illustrated in the Figure 2.3 below.

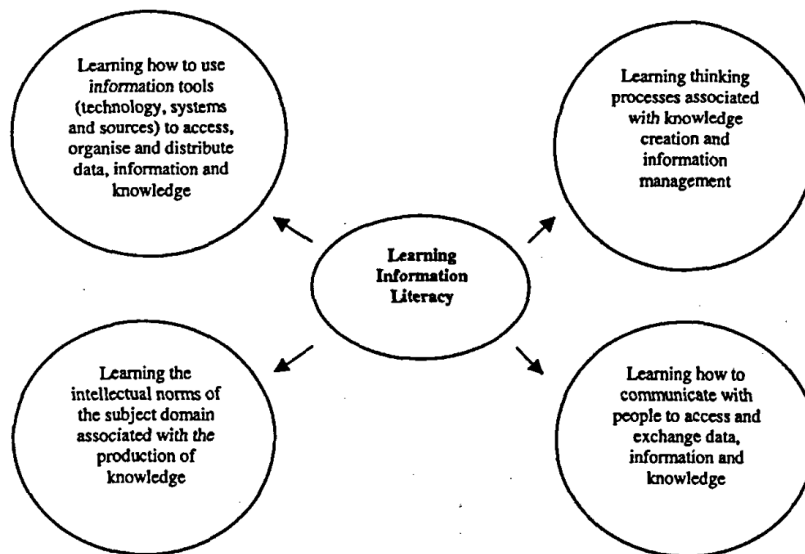


Figure 2. 3 Areas of Information Literacy students must have
Source: Hepworth (2009, p. 24)

This figure describes that learning information literacy includes four learning activities. The first activity is to learn thinking process dealing with knowledge creation and information management. The second activity is learning to communicate with people to access and exchange data, information, and knowledge. The third activity involves learning the intellectual norms of the subject domain in relevant with the production of knowledge. Lastly, the fourth activity is learning how to use information tools, including technology, systems, and sources) to access, organize and distribute data, information, and knowledge (Hepworth & Walton, 2009).

2.1.5 Skills in the Use of Resources in Scientific Writing

Scientific resources can be obtained from books or journal articles. Using resources in scientific writing require knowledge and skills in citation. Many universities have certain guidelines in citing references. In addition, some American universities, journal databases, and other organizations set standards of writing that become internationally acknowledged and widely used as writing styles. Depending on the subject of study, institution usually follows

the already-available standards by deciding a certain writing style. Social sciences, for instance, follow the rule of American Psychological Association (APA), while medical sciences normally follow American Medical Association (AMA) (Lipson, 2006, p. 5). The role of writing style in scientific writing is to organize reading resources in an accurate, standardized, and consistent way.

Lipson (2006, p. 5) stated that there are three reasons why authors need to cite references correctly:

1. To give credit to other researchers whose works and ideas are used in the present writing.
2. To show readers the materials authors use for analysis and on which they draw conclusion.
3. To lead readers to the materials used in the present writing so they can examine for themselves.

Citation in scientific writing indicates authors' good manner or ethics. Therefore, an author should not mislead the readers. The author should provide accurate citation to avoid misleading. The absence of citation in writing while borrowing one's idea is form of intentional plagiarism. Alajami (2021) maintains that intentional plagiarism has two elements: one of knowing and that of voluntary (willful). Not acknowledging that one's production is one's own property is categorized as intentional plagiarism. Similarly, reuse one's production without proper referencing to its source is also categorized as intentional plagiarism.

Writing scientific papers denotes the use of acceptable standards in organizing reading resources, either as citation in the body of text or in the list of bibliography at the end of paper. There are rules that are already established that the authors of scientific papers need to follow. Following these standards shows ethical manner in scholarly communication, especially when it is going to be published. These rules are called writing style.

With the development of information and communication technology, the rules of various writing styles are accommodated in reference manager applications that ease authors

in citing references. Some popular reference managers are RefWorks (<https://www.refworks.com/refworks2/>), EndNote (<https://endnote.com/>), Zotero (<https://www.zotero.org/>), and Mendeley (<https://www.mendeley.com/>). Using one of these tools, author can cite in accurate, consistent, and correct way so that he can avoid plagiarism. Students need to learn the skills of using the reference tool to improve their scientific writing activities.

2.2 Related Studies

Writing for academic purposes involves certain skills such as critical thinking, composing ideas into words, searching for resources, and so on. Students often face obstacles when writing for final assignments. Most students struggle very hard to overcome their problems in writing for research. Many factors affect students' problems in academic writing ranging from psychological, lingual, as well as technological aspects. Most students lack skills in expressing ideas, skills in constructing ideas into words, finding resources to support ideas in writing, as well as hard skills in using writing tools. Previous studies have been done in examining students' difficulties in writing for academic purposes as well as some strategies suggested to overcome those difficulties. The following paragraphs will discuss those researches in more detail.

A study by Tremblay-Wragg, et.al. (2021) found that undergraduate students feel isolated due to a lack of academic writing ability. In his article she suggested an innovative concept of a writing retreat model for which the objectives are: 1) progress academic writing based on realistic individual goals; 2) identify optimal writing conditions; and 3) reduce isolation. The findings indicated that the implemented model results in positive effects in developing students' academic writing abilities through a community of practice forming during writing retreats and interacting afterward.

Another study conducted by Murray and Sharpling (2019) examines the traits of academic values students' have in academic writing. In their research, Murray and Sharpling (2019) combine two methods of measuring students' academic writings in form of essays: Thurstone's methodology and Kelly's repertory grid technique. The findings suggest that there are some traits of poor academic writing ability of students; they are: less favored in the comparative judgment, poor introductions, a tendency to be overly formulaic, vagueness of language and ideas, an insufficient sense of audience and of what should be treated as given and new information, limited and imprecise vocabulary, lack of relevance, failure to juxtapose ideas, inappropriate register, and weak conclusions.

English as a dominant international scientific language to some extent becomes a pitfall for non-Anglo-speaking students. Therefore, a code-switching strategy is required to help students develop scientific writing in English. A research by Archila et al. (2021) assessed a methodical and purposeful code-switching pedagogical strategy in writing academic papers. In this study, the researchers suggest the importance of the five stages of the systematic and purposeful code-switching pedagogical strategy in order to describe how the strategy nurtures the university students' understanding of Spanish–English bilingual scientific writing by improving the students' argumentation skills.

Similarly, students' ability in the comprehension of scientific texts requires critical thinking skills. Critical thinking, particularly critical reading skills, lacks in most of our educational curriculum. This, in turn, results in the low ability of students in expressing arguments and drawing conclusions, either to understand the scientific text or to express ideas in academic writing. Higher education institutions should foster these skills by integrating them into the curriculum. Students need to be trained in reading journal articles more often in any course to improve their self-confidence in understanding scientific texts. Journal articles written by more expert authors in their fields are believed to have credibility and, as such, are

more comprehensible than sources of less credible (Werner da Rosa & Otero, 2018). An enhancement of students' feelings of competence in dealing with scientific subject matter would have a beneficial effect in handling obstacles in science texts and, therefore, in learning from them. The credibility of a source of information is one of the factors that may affect a decision-maker's assessment of problems or difficulties in controversial information. Students making decisions would tend to judge less problematic and more comprehensible claims by high credibility sources compared to those coming from less credible sources.

A study of students' understandings about the nature of science (NOS) and their arguments in the context of controversial socio-scientific issue (SSI) (Khishfe et al., 2017) showed that there are no significant correlations between argument components and NOS aspects. On the other hand, qualitative data showed that participants who generated well-developed arguments across the four SSI also exhibited more informed understandings of the NOS aspects. Further, the chi-square analyses did not show significant differences in participants' arguments and NOS understandings across the four scenarios. This study implies substantial thought needs to be given by teachers, science educators, and curriculum developers about the relationship between science and religion that needs to be shown to students.

Since writing academic papers necessitates supporting ideas with evidence, students must have the capability in searching resources, especially journal articles for their references. However, there are many factors that influence students' use of journal articles. Craig-Duchesne et al. (2018) found that students' use of journals varies considerably. There are eight influencing factors, they are: student's communication skills, student's communication preferences, journal structure, frequency of use, student's workload, and three other factors related to the social environment. In short, personal and contextual factors are the two main influences of students' use of a journal. In their research, they suggest that a reflective approach is desirable to optimize journal use.

Academic writing entails the application of knowledge and skills in citing sources of evidence in supporting one's ideas. Therefore, students need to understand the style and rules of citation so they can write accordingly. The discussion of citation in writing is part of research integrity where an author must demonstrate his/her honesty, trust, and respect for other researchers whose ideas are 'borrowed' in the piece of academic paper. However, the skills of citing references for some students has brought another issue in academic writing. Most students do not have the idea of writing correct citations of references (Kargbo, 2010). They are not informed of so many styles that they need to be aware of and choose the best style of citation that is recommended by the faculty. Some faculty or department provide detailed guidelines, while some others do not. In the case of faculty providing a detailed guideline, students can follow the manual confidently. Meanwhile, for those that do not explicitly incorporate citation in detail in their writing guideline, students lack confidence and are left confused so they mixed styles in their writing and show inconsistency. In the conclusion, Kargbo (2010) suggests the collaboration between faculty and librarians to provide adequate treatment for students in coping with citation problems in writing scientific papers.

Mckenna & Kyser (2021) suggest that students facing problems in writing academic papers must participate in writing workshops more often. In their research they propose that intensive writing experiences will enhance students' writing proficiency, raise positive perceptions of writing, and gain knowledge and decision of when they need writing assistance. The workshop will support the researchers in gaining insight into their students' experiences leading towards improved pedagogy.

2.3 Conceptual Framework

This research involves concepts that need to be explained in detail to make the understanding better. In this regard, the following paragraph will elaborate in more detail on the conceptual framework of this research.

Scientific writing in this research is formal writing that is highly structured that follow the guideline of research. It contains some chapters and sections beginning with introduction, literature review, methodology, findings, and discussion, as well as conclusion and suggestions. In addition to the structure, the process of developing the writing involves critical thinking, evidence support, and writing skills. To ease understanding of the concept, Figure 2.1 below illustrates the conceptual framework in a visual form.

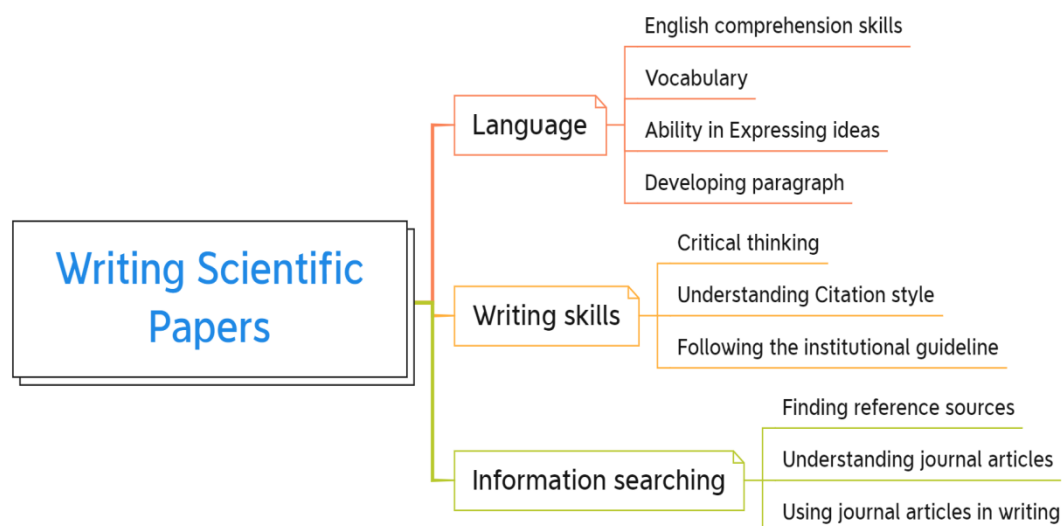


Figure 2. 4 Conceptual Framework of the Research

From the conceptual framework above, this research will investigate students' problems in language, writing skills, and information searching. The problems of language include students' problem in understanding English texts from the resources, students' vocabulary limitation, students' problems in expressing the idea, and students' problem in developing paragraph. The writing skills problems involve critical thinking, understanding citation styles, and following the institutional guidelines. Finally, the information searching

includes problems in finding reference sources, understanding journal articles, and using journal articles.

