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Metacognition in Writing Scientific Articles of Postgraduate Students of Indonesian Language Education

ABSTRACT: One's metacognition can be measured through his/her ability to express ideas in writing. The ability to write good arguments demonstrates good logic ability as well. In this study will be investigated is forms and factors that influence metacognition in the writing of scientific articles. The form of metacognition is reflected in the quality of the argument presented in the results and discussion section. A strong argument contains six elements, namely: C (Claim), G (Ground), W (Warrant), B (Backing), M (Modals), and R (Rebuttals). The researchers used S. Toulmin (2003)'s model to study the quality of the argument in the writing of scientific articles. This study is qualitative descriptive research. Data sources in this study are documents and interviews, namely: three scientific articles and interviews with the authors of the articles. Sampling technique uses purposive sampling technique aimed, and content analysis technique is interactive analysis techniques. The results showed that metacognition forms in the writing of scientific articles of Postgraduate students of Indonesian Language Education at the UNS (Universitas Sebelas Maret or 11th March University) in Surakarta, Central Java, Indonesia is categorized into two: strong and fairly strong; factors affecting metacognition consist of two components, namely metacognition and writing components. At the metacognition stage, the three informants are able to understand the problem, solve problems, do solving, and re-examine the process. While at the writing stage, the three informants have done pre-writing, writing, and post-writing. The most influential stage is the pre-writing stage.

KEY WORDS: Metacognition; Argument; Scientific Articles.

INTRODUCTION

Individual is said to learn if they experience the level of change, we are commonly referred to as learning outcomes. Learning outcomes consist of three domains, namely: cognitive, affective,

and psychomotor. Of the three domains that became the highlight in this study is cognitive domain. Cognitive related to the development activities of thought that at the highest point called as metacognition. Metacognitive plays an important role in

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Suggested Citation: Mahsa, Masithah, Budhi Setiawan & Muhammad Rohmadi. (2019). "Metacognition in Writing Scientific Articles of Postgraduate Students of Indonesian Language Education" in *HONAI: International Journal for Educational, Social, Political & Cultural Studies*, Volume 2(1), May, pp.27-46. Bandung, Indonesia: Minda Masagi Press owned by ASPENSI and STISIP Amal Ilmiah, Wamena, Papua, with ISSN 2621-1653 (print) and ISSN 2621-3621 (online).

Article Timeline: Accepted (January 15, 2019); Revised (March 15, 2019); and Published (May 30, 2019).

the learning process (Wilson, 2001; Lashari *et al.*, 2012; and Ahmadi, Ismail & Abdullah, 2013).

According to B.J. Zimmerman & A.R. Moylan (2009), as cited also in Mansoor Ahmad Channa *et al.* (2015), metacognitive that denotes to knowledge, its cognizance, and regulation of one's thinking (Zimmerman & Moylan, 2009; and Channa *et al.*, 2015). Various metacognitive related studies have been carried out, among them Dyah Werdiningsih (2015)'s research, and other scholars, which shows that the elementary students' language skills are still low, because they have not been consistently using metacognitive strategies (Werdiningsih, 2015; Tulusita, 2016; and Gonzalez, 2017).

In their studies, I. Riyadi (2012), and other scholars, examined the relationship between metacognitive knowledge, learning, teaching, and holding an assessment. Based on these, it can be concluded that metacognition plays an important role in the individual learning process (Lai, 2011; Hrbapkovaa, Hladikb & Vavrova, 2012; and Riyadi, 2012).

Molecular thinking is divided into two, that is knowledge and regulation metacognition. Knowledge of metacognition includes knowledge of cognition in learning, knowledge of cognitive tasks, and knowledge of strategies. Whereas, the metacognition regulation consists of planning, monitoring, evaluation, and revision (Brown, 1987; An & Cao, 2014; and Farahian & Avarzamani, 2018).

Metacognition in this study is focused on metacognition regulations. Metacognition regulation relates to critical thinking ability. One's critical thinking ability can be measured through writing skills. In this case, it relates to the way a person expresses the argument in writings. The ability to write good arguments demonstrates good logic ability as well (*cf* Lai, 2011; Eichbaum, 2014; and Chick, 2015).

In the academic, writing is not merely an expression of opinion, but must be followed by sharp and accurate arguments. Argumentation is an attempt to demonstrate that something is right marked with

logical factual data (Bailey, 2011; Mercier & Sperber, 2011; and Adian & Pratama, 2013:18). Writing arguments is not as simple as imagined. Research on arguments was previously conducted by Y. Herlanti (2014), and other scholars, that showed that the argumentation of most students tended to be simple at level II, which was able to reveal A claim was accompanied by reasons. It is interesting for researchers to analyze student metacognition through the arguments it presents (*cf* Lai, 2011; Herlanti, 2014; and Chick, 2015).

Student arguments can be seen in their scientific work. The scientific work can be in the form of Undergraduate Thesis, Master Thesis, and Doctoral Dissertation. The ones to be discussed here are the arguments in the articles that come from the Master Thesis. Research focuses on the results and discussion section as this section shows how the student expresses idea. There are two problem formulas to be discussed in this study: the form of metacognition and the factors that influence metacognition in the writing of scientific articles.

Firstly, the metacognition form. This can be seen from the quality of the argument presented in the results and discussion section. The quality of the argument is examined using S. Toulmin (2003)'s model, as cited also in Simon Philip Botley & Faizal Hakim (2014). There are six elements of argument comprising: C (Claim), G (Ground), W (Warrant), B (Backing), M (Modals), and R (Rebuttals). To categorize the quality of the argument in the writing of scientific articles, it is necessary for the assessment guidelines (*cf* Toulmin, 2003; and Botley & Hakim, 2014; and Suhartoyo, Mukminatien & Laksmi, 2015). The format of the argument rating, according to S. Toulmin (2003), as cited also in Simon Philip Botley & Faizal Hakim (2014), is as shown in table 1.

Secondly, the factors that influence metacognition can be seen from interviews with informants related to metacognition and writing skills. In this context, Yuliana Setyaningsih (2016), and other scholars, mentioned that there were three stages in

Table 1:
S. Toulmin (2003)'s Model Argument Evaluation Format

No.	Toulmin Argument Components						Category
	C	G	W	B	M	R	
1.	-						Very weak
2.	-	-					Weak
3.	-	-	-				Fair
4.	-	-	-	-			Strong
5.	-	-	-	-	-		Very Strong

Notes: C = Claim; G = Ground; W = Warrant; B = Backing; M = Modals; and R = Rebuttals.

writing journal articles that were pre-stage of writing, writing, and post-writing. Referring to the above theory, the indicator of writing capability is developed from these three stages (Carnell *et al.*, 2008; Setyaningsih, 2016; and Sivarajah *et al.*, 2017).

Meanwhile, metacognition regulatory indicators refer to the results of Z. Chairani (2013), and other scholars' researches, which divided the metacognition stage into four, i.e. understanding the problem, planning problem solving, problem solving, and checking again (Chairani, 2013; Amin & Mariani, 2017; and Trisna, Budayasa & Siswono, 2018). Based on that, the research will be metacognition in the writing of the scientific article of Postgraduate students of Indonesian Language Education at the UNS (*Universitas Sebelas Maret* or 11th March University) in Surakarta, Central Java, Indonesia.

METHODS

The form of this research is descriptive qualitative. The method used is record and record method. Data sources in this study are documents and interviews, namely three scientific articles and interviews with the authors of the articles. Technique intake of this research use purposive sampling technique. The sample of this research is three Postgraduate alumni of Indonesian Language Education at the UNS (*Universitas Sebelas Maret* or 11th March University) in Surakarta, Central Java, Indonesia. Content analysis techniques are interactive analysis techniques (Mason, 2002; Mayring, 2014; and Palinkas *et al.*, 2015).

Data validity test in this research using triangulation of sources and methods. Triangulation of source is technique of examination data validity of analysis result through interview to informant, or different source, but still discuss the same problem. While methodological triangulation is a technique of collecting different data to get data from different data source (Sugiyono, 2008:242; Bekhet & Zauszniewski, 2012; and Zohrabi, 2013).

RESULTS AND DISCUSSION

Research Results. The researchers analyzed the three Postgraduate students of Indonesian Language Education at the UNS (*Universitas Sebelas Maret* or 11th March University) in Surakarta, Central Java, Indonesia), namely: IABM (Iko Agustina Boang Manalu), EWD (Elen Witri Daeli), and YEA (Yovantus Eduardus Abut).

Firstly, *Form of Metacognition in Scientific Writing*. The pattern of argument in the article of IABM (Iko Agustina Boang Manalu), in 2017, entitled "Kebiasaan Membaca Mahasiswa Program Studi Pendidikan Bahasa dan Sastra Indonesia Universitas Sebelas Maret" [Reading Habits of Students at the Study Program of Indonesian Language and Literature Education in Eleven March University] consisted of four elements. This is evidenced by the following results:

(C) Seseorang yang dikategorikan memiliki kebiasaan membaca yang baik tentu mendedikasikan waktu, upaya, perhatian, bahkan biaya demi pemenuhan kebutuhannya akan membaca.

(G) Hasil penelitian menunjukkan keempat informan menyadari betapa pentingnya membaca. Tujuan membaca mereka didominasi kepentingan menyelesaikan tugas atau mempersiapkan ujian. Namun, informan tetap mengusahakan memiliki waktu untuk membaca bahan lain dengan tujuan mengembangkan diri, sebagai hobi, mengisi waktu luang, dan sebagai hiburan. Ada keterkaitan yang signifikan antara kebiasaan membaca seseorang dengan latar belakang keluarganya, pekerjaan, atau pendapatan orangtua, sekolah, dosen, dan frekuensi kegiatan membaca bahan digital. Kendala yang menghambat perkembangan kebiasaan membaca informan, yang ditemukan dalam penelitian ini, antara lain: (1) kendala internal, seperti suasana hati yang tidak stabil atau “moody”, malas, tidak dapat mengatur penggunaan waktu, dan penguasaan bahasa asing yang rendah; serta (2) kendala eksternal, seperti teman-teman di sekitar yang sering mengajak mengobrol, budaya membaca belum menjamur di lingkungan kampus dan tempat-tempat umum di tengah-tengah masyarakat, banyaknya aktivitas dan tugas sehingga kurangnya waktu untuk membaca bahan yang disukai, informan yang suasana di rumahnya tidak kondusif untuk membaca, serta kondisi sosial-ekonomi orangtua yang tidak mampu menyediakan bahan bacaan sesuai kebutuhan.

(W) Kebiasaan membaca adalah perilaku membaca yang dilakukan berulang kali, menjadi aktivitas sehari-hari, membentuk keteraturan, dan melekat sebagai kebutuhan jiwa seseorang.

(B) Akanda, Hoq & Hasan (2013:60-71) menguraikan piranti-piranti yang menjadi indikator mendeskripsikan kebiasaan membaca mahasiswa, antara lain: tujuan membaca, jenis bacaan, faktor penentu memilih suatu bacaan, lama membaca dalam satuan jam, kebiasaan membaca surat kabar, tujuan dan lama menggunakan internet, bacaan periodik, tujuan dan frekuensi mengunjungi perpustakaan, hiburan favorit, serta sumber informasi yang biasa dibaca (IABM, 2017).

Translation:

(C) A person who is categorized as having good reading habits certainly dedicates his/her time, effort, attention, and even costs to meet his/her reading needs.

(G) The results of the study showed that all four informants realized how important reading was. Their reading goals are dominated by the interests of completing assignments or preparing for examinations. However, the informant still tried to have time to read other materials with the aim of developing themselves, as a hobby, to fill in spare time, and as entertainment. There is a significant relationship between a person's

reading habits with his/her family background, work, or income of parents, schools, lecturers, and the frequency of reading digital material. Constraints that hinder the development of informant reading habits found in this study include: (1) internal constraints, such as mood swings or moody, laziness, unable to manage the use of time, and low mastery of foreign languages; and (2) external constraints, such as friends around who often invite to chat, reading culture has not mushroomed in the campus environment and public places in the midst of the community, many activities and assignments so that the lack of time to read the preferred material, informants the atmosphere in the house is not conducive to reading, as well as the socio-economic conditions of parents who are unable to provide reading material as needed.

(W) Reading habit is reading behavior which is done repeatedly, becoming daily activities, forming regularity, and sticking to the needs of one's soul.

(B) Akanda, Hoq & Hasan (2013:60-71) describe devices that are indicators of describing students' reading habits, including: the purpose of reading, the type of reading, the determinants of choosing a reading, the length of reading in hours, reading habits newspapers, the purpose and duration of using the internet, periodic reading, the purpose and frequency of visiting the library, favorite entertainment, and sources of information that are commonly read.

The C (Claim) statement claimed by the author is a statement of fact. This is reinforced by the G (Ground) in the form of observation and interview results. After the C and G was found, the author bridged it with the W (Warrant). Furthermore, the W is reinforced by a B (Backing) expert's declaration to retain its arguments. In terms of order of the argument pattern, the author started with a W, then, followed by a C, B, and ending the G. The sequence does not affect the quality of the author's argument, since there is no rule that the argument writing should be sequential (Toulmin, 2003; Walton, Reed & Macagno, 2008; Chairani, 2013; Botley & Hakim, 2014; Setyaningsih, 2016; and IABM, 2017).

Based on the results of the above analysis, it can be categorized that the metacognition form reflected in IABM (Iko Agustina Boang Manalu) argument is strong and acceptable to the reader as it contains the basic elements of C, G, and W as well as support element in the form of B (Toulmin, 2003;

Walton, Reed & Macagno, 2008; Chairani, 2013; Botley & Hakim, 2014; Setyaningsih, 2016; and IABM, 2017).

There are four elements of the argument in EWD (Elen Witri Daeli) article, in 2016, entitled "Pengaruh Model Pembelajaran Quantum Learning terhadap Kemampuan Menulis Teks Deskripsi Ditinjau dari Kemampuan Berfikir Logis pada Siswa di SMP [Sekolah Menengah Pertama] Negeri Kabupaten Karanganyar" [The Effect of Quantum Learning Teaching Model on the Ability to Write Text Descriptions Viewed from the Ability to Think Logically of Students at the Middle School in Karanganyar Regency], as follows:

(C) Model pembelajaran "quantum learning" sangat direkomendasikan untuk diimplementasikan pada pembelajaran keterampilan menulis teks deskripsi, karena strategi pembelajaran yang serangkum dalam konsep model pembelajaran "quantum learning" mampu meningkatkan keterampilan menulis teks deskripsi siswa dalam kondisi apapun, khususnya bagi siswa yang memiliki kemampuan berpikir logis rendah.

(G) Berdasarkan hasil hitungan terlihat bahwa siswa yang memiliki kemampuan berpikir logis tinggi, jika diajarkan dengan model pembelajaran "quantum learning", menunjukkan peningkatan dibandingkan dengan siswa yang memiliki kemampuan berpikir logis rendah diajarkan dengan model pembelajaran "quantum learning". Artinya, keterampilan menulis teks deskripsi siswa yang memiliki kemampuan berpikir logis tinggi sangat cocok dan mendukung prestasi belajar siswa, jika diajar dengan model pembelajaran "quantum learning". Temuan lain adalah rata-rata skor keterampilan menulis teks deskripsi siswa yang memiliki kemampuan berpikir logis rendah, diajar dengan model pembelajaran "quantum learning", lebih tinggi dibandingkan dengan siswa yang memiliki kemampuan berpikir logis tinggi, diajar dengan model pembelajaran "open-ended learning".

(W) Ada perbedaan signifikan keterampilan menulis teks deskripsi siswa yang diajar dengan model pembelajaran "quantum learning" dan "open-ended learning" ditinjau dari kemampuan berpikir logis siswa. Temuan ini menunjukkan bahwa secara empirik, model pembelajaran "quantum learning" lebih baik daripada "open-ended learning" dalam proses belajar-mengajar keterampilan menulis teks deskripsi.

(B) Secara teoritis diungkapkan bahwa model pembelajaran "quantum learning" jauh lebih unggul dibandingkan dengan

model pembelajaran lainnya, dan juga dapat diimplementasikan untuk semua mata pelajaran, karena pada hakikatnya, model pembelajaran ini merupakan ramuan dari berbagai teori dan pandangan psikologi kognitif dan temuan-temuan empiris lainnya (Suryani & Agung, 2012:90). [...] (EWD, 2016).

Translation:

(C) The quantum learning teaching model is highly recommended to be implemented in the learning of writing descriptive text skills, because the learning strategies that are summarized in the concept of the quantum learning teaching model are able to improve the students' writing text description skills under any conditions, especially for students who have the ability logical thinking low.

(G) Based on the results of the calculations it appears that students who have high logical thinking ability, if taught with a quantum learning teaching model, show an increase compared to students who have low logical thinking ability taught with a quantum learning teaching model. That is, the skills of writing descriptive text of students who have high logical thinking skills are very suitable and support student learning achievement, if taught with a quantum learning teaching model. Other findings are the average scores of writing description text skills of students who have low logical thinking ability, taught with a quantum learning teaching model, higher than students who have high logical thinking ability, taught with an open-ended learning teaching model.

(W) There is a significant difference in the skills of writing text descriptions of students who are taught with the teaching models of quantum learning and open-ended learning in terms of students' logical thinking abilities. This finding shows that empirically, the teaching models of quantum learning is better than open-ended learning in the teaching-learning process of writing descriptive text.

(B) Theoretically revealed that the teaching model of quantum learning is far superior to other teaching models, and can also be implemented for all subjects, because in essence, this learning model is a mixture of various theories and views of cognitive psychology and other empirical findings (Suryani & Agung, 2012: 90). [...].

The G (Ground) expressed in the article is facts in the form of test results. This is the basis for the forming of the C (Claim). To confirm the C and link it to G, then, the author presents the W (Warrant). The W is getting stronger, because it is followed by a B (Backing) expert statement (Toulmin,

2003; Chairani, 2013; Botley & Hakim, 2014; EWD, 2016; and Setyaningsih, 2016).

Based on the above analysis, it can be concluded that the metacognition form reflected in EWD (Elen Witri Daeli) argument has been strong, because it includes the basic elements, i.e. G, C, and W, and support element in the form of B. It can be argued that the arguments conveyed by EWD can be accepted rationally. However, if viewed from the order of order the argument pattern begins with the W, B, G, and end with the C (Toulmin, 2003; Chairani, 2013; Botley & Hakim, 2014; EWD, 2016; and Setyaningsih, 2016).

The pattern of argument in YEA (Yovantus Eduardus Abut) article, in 2017, titled "Fenomenologi Feminisme dan Nilai Pendidikan Karakter Tokoh dalam Novel *Pasung Jiwa* serta Relevansinya dengan Pembelajaran Bahasa dan Sastra di SMA [Sekolah Menengah Atas]" [The Phenomenology of Feminism and the Values of Character Education in *Stuck in the Soul* Novels and Their Relevance to Language and Literature Learning in High Schools], consisted of three elements, as follows:

(C) Dimensi-dimensi feminisme yang dapat dilihat dari kesadaran yang dialami para tokoh membawa kita pada dimensi: pertama, bahwa dalam konteks kehidupan keluarga, kebebasan menjadi tolak ukur bagi orang tua untuk mendidik anak-anaknya; kedua, bahwa dimensi feminisme dalam konteks sosial masyarakat dapat dipelajari dari semua sosok tokoh-tokoh di atas; dan, ketiga, dimensi feminisme dalam konteks religius. Selanjutnya, melalui melihat dan membiarkan realitas masuk dalam kesadaran siswa, kajian fenomenologi sangat relevan dalam mengembangkan pembelajaran bahasa dan sastra Indonesia di SMA.

(G) Dalam konteks kehidupan berkeluarga, tokoh Sasa dan ibunya menjadi tokoh sentral dalam membangun kesadaran pembaca dan peneliti untuk melihat fenomena dan feminisme dalam keluarga yang dibangun atas dasar kasih-sayang dan cinta. Dalam konteks sosial masyarakat, hal ini dapat dilihat dari usaha dan kerja keras, setia kawan, dan kebersamaan yang tampak dalam diri tokoh tersebut; dalam konteks religius, hal ini tampak dalam tokoh Jaka Wani, ketika menjadi seorang pejuang atas nama agama dan fenomena-fenomena yang dialami oleh para tokoh membangun sebuah kesadaran akan nilai-nilai pendidikan

karakter, sebagai berikut: tanggung jawab, rela berkorban, religius, kejujuran, keadilan, dan setia kawan.

(W) Fenomena-fenomena yang dialami semua tokoh dalam novel "Pasung Jiwa" menggambarkan berbagai persoalan dalam kehidupan sosial. Meskipun demikian, tidak semua tokoh dalam novel menunjukkan fenomena feminisme. Kajian fenomenologi dalam novel "Pasung Jiwa" melalui tokoh-tokoh di atas memberikan sebuah gambaran nilai pendidikan karakter yang harus dipegang dan dipupuk dalam kehidupan bermasyarakat (YEA, 2017).

Translation:

(C) The dimensions of feminism that can be seen from the awareness experienced by the characters bring us to the dimensions: firstly, that in the context of family life, freedom becomes a benchmark for parents to educate their children; secondly, that the dimension of feminism in the social context of society can be learned from all the figures above; and, thirdly, the dimension of feminism in a religious context. Furthermore, through seeing and letting reality enter student awareness, phenomenological studies are very relevant in developing Indonesian language and literature learning in high school.

(G) In the context of family life, Sasa and his mother are central figures in building the awareness of readers and researchers to see phenomena and feminism in families that are built on love and love. In the social context of society, this can be seen from the effort and hard work, loyal friends, and togetherness that appear in the character; in a religious context, this is evident in the figure of Jaka Wani, when he became a fighter in the name of religion and the phenomena experienced by the figures built an awareness of the values of character education, as follows: responsibility, self-sacrifice, religious, honesty, justice, and loyal friend.

(W) The phenomena experienced by all the characters in the novel of "Stuck in the Soul" illustrate various problems in social life. However, not all characters in the novel show the phenomenon of feminism. Phenomenology studies in the novel of "Stuck in the Soul" through the figures above provide a picture of the value of character education that must be held and fostered in social life.

The C (Claims) submitted in the article serve to affirm the position of the author in the article. This is based on the G (Ground) in the form of research results. In order to strengthen its position in the argument, the

Table 2:
Recapitulation of Metacognition Forms in Scientific Writing

No.	Writer	Article Title	Argument Pattern	Category
1.	IABM (Iko Agustina Boang Manalu)	“Kebiasaan Membaca Mahasiswa Program Studi Pendidikan Bahasa dan Sastra Indonesia Universitas Sebelas Maret” (Reading Habits of Students at the Study Program of Indonesian Language and Literature Education in Eleven March University)	G-C-W-B (Ground-Claims-Warrant-Backing)	Strong
2.	EWD (Elen Witri Daeli)	“Pengaruh Model Pembelajaran Quantum Learning terhadap Kemampuan Menulis Teks Deskripsi Ditinjau dari Kemampuan Berfikir Logis pada Siswa di SMP Negeri Kabupaten Karanganyar” (The Effect of Quantum Learning Teaching Model on the Ability to Write Text Descriptions Viewed from the Ability to Think Logically of Students at the Middle School in Karanganyar Regency)	G-C-W-B (Ground-Claims-Warrant-Backing)	Strong
3.	YEA (Yovantus Eduardus Abut)	“Fenomenologi Feminisme dan Nilai Pendidikan Karakter Tokoh dalam Novel <i>Pasung Jiwa</i> serta Relevansinya dengan Pembelajaran Bahasa dan Sastra di SMA” (The Phenomenology of Feminism and the Values of Character Education in <i>Stuck in the Soul</i> Novels and Their Relevance to Language and Literature Learning in High Schools)	G-C-W (Ground-Claims-Warrant)	Fairly Strong

author put forward a W (Warrant) that serves as a bridge between the G and the C (Toulmin, 2003; Chairani, 2013; Botley & Hakim, 2014; Setyaningsih, 2016; and YEA, 2017).

Based on the above analysis, it can be said that the metacognition form reflected in YEA (Yovantus Eduardus Abut) argument is strong enough, because it contains the basic elements of C, G, and W. However, YEA (2017) does not contain supporting elements, i.e. B = Backing, M = Modals, and R = Rebuttals (Toulmin, 2003; Chairani, 2013; Botley & Hakim, 2014; Setyaningsih, 2016; and YEA, 2017).

From the three data, it can be concluded that the form of metacognition of Postgraduate students of Indonesian Language Education at the UNS (*Universitas Sebelas Maret* or 11th March University) in Surakarta, Central Java, Indonesia is categorized into two, that is strong and strong enough. The recapitulation is as shown in table 2.

Secondly, *Factors Affecting Metacognition in Scientific Writing*. Factors affecting metacognition can be seen based on the interview results of the three informants,

namely: IABM (Iko Agustina Boang Manalu); EWD (Elen Witri Daeli); and YEA (Yovantus Eduardus Abut). All of them are the Postgraduate Master' Students of Indonesian Language Education at the UNS (*Universitas Sebelas Maret* or 11th March University) in Surakarta, Central Java, Indonesia. This interview is related to the metacognition component consisting of four indicators, namely: (1) understanding the problem; (2) plotting problem solving; (3) problem solving and checking back; and (4) writing stages consisting of pre-writing, writing, and post-writing (Christoph, 2006; Papaleontiou-Louca, 2008; and Ardina & Setianingsih, 2017).¹

¹See also, for example, Interview with EWD (Elen Witri Daeli), a Master' Student of Postgraduate Indonesian Language Education at the UNS (*Universitas Sebelas Maret* or 11th March University) in Surakarta, Central Java, Indonesia. Interview has been conducted at her home, on 15th May 2017; Interview with YEA (Yovantus Eduardus Abut), a Master' Student of Postgraduate Indonesian Language Education at the UNS (*Universitas Sebelas Maret* or 11th March University) in Surakarta, Central Java, Indonesia. Interview has been conducted at the UNS Campus, on 6th June 2017; and Interview with IABM (Iko Agustina Boang Manalu), a Master' Student of Postgraduate Indonesian Language Education at the UNS (*Universitas Sebelas Maret* or 11th March University) in Surakarta, Central Java, Indonesia. Interview has been conducted at the UNS Campus, on 5th June 2017.

At the stage of understanding the problem, the three informants have been aware of the process of thinking and being able to describe it. Evidently, before starting something, some authors first make plans regarding what they want to do. This is drawn from the following interviews:

IABM (Iko Agustina Boang Manalu): *"Making plan"* [Excerpt 1].

EWD (Elen Witri Daeli): *"Making plans or frameworks of thought that will guide"* [Excerpt 2].²

Unlike, YEA (Yovantus Eduardus Abut) that mentions as following here:

YEA (Yovantus Eduardus Abut): *"Understanding a problem first to be more mature in action"* [Excerpt 3].³

Informants have their own way of identifying what is known and asked of a problem by looking for the background of the problem, looking at various sides, and outlining the problem in detail. This is in line with the following interview results:

IABM (Iko Agustina Boang Manalu): *"Parsing the problem, identify the cause of the problem, and the factors associated with it"* [Excerpt 4].

EWD (Elen Witri Daeli): *"Finding out the problem background and identify existing problems based on that background"* [Excerpt 5].

YEA (Yovantus Eduardus Abut): *"Looking from all sides, looking for as much information as possible, and conclude"* [Excerpt 6] (*ibidem* with footnote 1).

In fact, by reading and looking at the situation, some informants have been able to understand a problem. This is evident from the following interview results:

²Interview with EWD (Elen Witri Daeli), a Master' Student of Postgraduate Indonesian Language Education at the UNS (*Universitas Sebelas Maret* or 11th March University) in Surakarta, Central Java, Indonesia. Interview has been conducted at her home, on 15th May 2017; and Interview with IABM (Iko Agustina Boang Manalu), a Master' Student of Postgraduate Indonesian Language Education at the UNS (*Universitas Sebelas Maret* or 11th March University) in Surakarta, Central Java, Indonesia. Interview has been conducted at the UNS Campus, on 5th June 2017.

³Interview with YEA (Yovantus Eduardus Abut), a Master' Student of Postgraduate Indonesian Language Education at the UNS (*Universitas Sebelas Maret* or 11th March University) in Surakarta, Central Java, Indonesia. Interview has been conducted at the UNS Campus, on 6th June 2017.

EWD (Elen Witri Daeli): "Yes" [Excerpt 7].

IABM (Iko Agustina Boang Manalu): *"Usually"* [Excerpt 8] (*ibidem* with footnote 2).

In contrast to YEA (Yovantus Eduardus Abut), who have to meet new direct sources can understand the problem, by stating as follows:

YEA (Yovantus Eduardus Abut): *"Not yet, if not yet got information from people, who are directly related"* [Excerpt 9] (*ibidem* with footnote 3).

The author also prepares another way, when the initial method is unable to understand the problem. This is in line with the following interview results:

YEA (Yovantus Eduardus Abut): *"Asked directly to the source"* [Excerpt 10].

EWD (Elen Witri Daeli): *"There is, by way of direct involvement in the matter"* [Excerpt 11].

IABM (Iko Agustina Boang Manalu): *"Looking at problems from different perspectives and from various assessments"* [Excerpt 12] (*ibidem* with footnote 1).

In the process of plotting problem solving, some authors re-identify problems, look at the situation, analyze the causal factors of the problem, find the method, and identify obstacles that may be present in problem solving. This is in line with the following interview results:

IABM (Iko Agustina Boang Manalu): *"Identifying the problem, understand the context of the problem, analyze the factors that can be used to solve the problem, recognize the constraints that may be encountered while solving the problem in order to formulate its solutions"* [Excerpt 13].

YEA (Yovantus Eduardus Abut): *"Looking at the situation, listening directly from the source, looking for additional information, looking for the best solution"* [Excerpt 14].

EWD (Elen Witri Daeli): *"Planned research on the problem by determining the research method"* [Excerpt 15] (*ibidem* with footnote 1).

Each researcher must carefully prepare the material concept, so that it can be used to solve the problem. Informants choose to adjust the problem with their knowledge and apply pre-determined theories and

methods. This is in line with the following interview results:

IABM (Iko Agustina Boang Manalu): *"The concept of knowledge helps me to manage the flow of thinking, looking at problems from different perspectives with different approaches, and convergence at a conclusion"* [Excerpt 16].

EWD (Elen Witri Daeli): *"Apply predetermined theories and methods, so that problems can be solved"* [Excerpt 17].

YEA (Yovantus Eduardus Abut): *"I am adjusting the context of the problem with the concept of knowledge I have"* [Excerpt 18] (*ibidem* with footnote 1).

In making troubleshooting steps, one of the most important is the solution strategy. Overall, the authors believe that the strategies he/she uses can solve the problem. This is in line with the following interview results:

IABM (Iko Agustina Boang Manalu): *"Yes, because it is based on objective-oriented identification, understanding, analysis, and synthesis"* [Excerpt 19].

EWD (Elen Witri Daeli): *"Yes, because the results of the research can answer the problem precisely"* [Excerpt 20].

YEA (Yovantus Eduardus Abut): *"Yes, because everyone has the knowledge and experience it has. These two things can be used as a matter of solving the problem so that the problem can be solved"* [Excerpt 21] (*ibidem* with footnote 1).

Even, some informants try to look at other strategies to find the advantages and disadvantages of the strategies used. The way is diverse, some comparing it with relevant research also see the theory of experts. This is in line with the following interview results:

EWD (Elen Witri Daeli): *"After the results of the research, the analysis of the results of the study is then performed, and compared with other similar studies that use different strategies in solving the problem. From there, we can consider the strategies used by these researchers to be better than the strategies we use"* [Excerpt 22].

IABM (Iko Agustina Boang Manalu): *"By discussing, read diverse references, and learn from other similar issues"* [Excerpt 23].

YEA (Yovantus Eduardus Abut): *"I saw the previous research"* [Excerpt 24] (*ibidem* with footnote 1).

At the problem-solving stage, all informants have set up the steps and methods that they will use as a problem-solving procedure. This is in line with the following interview results:

IABM (Iko Agustina Boang Manalu): *"By following the planned stages and adjusting to the context of the problem"* [Excerpt 25].

EWD (Elen Witri Daeli): *"The data that has been collected through the research and method used, then, analyzed and performed the data reduction according to the type of data that has been determined. After grouping, analysis is done until the conclusion of the problem"* [Excerpt 26].

YEA (Yovantus Eduardus Abut): *"Following the planning that has been set up since the beginning"* [Excerpt 27] (*ibidem* with footnote 1).

Research will work if the problem-solving procedure goes according to what is expected. Here, all authors believe that the resolution procedure is in line with the plan. This is in line with the following interview results:

IABM (Iko Agustina Boang Manalu): *"Stay on the goal plan and oriented"* [Excerpt 28].

EWD (Elen Witri Daeli): *"If a prescriptive problem statement can be answered correctly"* [Excerpt 29].

YEA (Yovantus Eduardus Abut): *"As has been answered in the earlier question, that if all has been planned and thoughtful and has been prepared to solve the problem, then, the strategy will work"* [Excerpt 20] (*ibidem* with footnote 1).

The last stage to do is check again. This stage aims to ensure that problem solving is in progress as well as to discover the advantages and disadvantages of its data. This is in line with the following interview results:

YEA (Yovantus Eduardus Abut): *"Yes, to validate"* [Excerpt 31].

EWD (Elen Witri Daeli): *"Yes"* [Excerpt 32].

IABM (Iko Agustina Boang Manalu): *"Yes"* [Excerpt 33] (*ibidem* with footnote 1).

Each researcher has their own way of re-checking the results of the problem solving. This is in line with the following interview results:

IABM (Iko Agustina Boang Manalu):
"Looking at key points from what has been done, if it has reached the goal" [Excerpt 34].

EWD (Elen Witri Daeli): *"By way of verifying the data, the results of the research are then adapted to the problem statement"* [Excerpt 35].

YEA (Yovantus Eduardus Abut): *"Re-review using pre-arranged stages"* [Excerpt 36] (*ibidem* with footnote 1).

The writing stages are divided into three: pre-writing, writing, and post-writing. In the pre-writing phase, generally the first thing a researcher does before starting writing is to find a problem raised by looking at reality in the field. Next, define goals and formulate topics. This is in line with the following interview results:

IABM (Iko Agustina Boang Manalu): *"Going from the problem then defining the topic, limiting the issues to be covered in the article, defining the approaches used in peeling issues, creating a framework of thinking, and searching for various sources of data and reading"* [Excerpt 37].

EWD (Elen Witri Daeli): *"Determining the purpose or problem to be raised in that scholarly article"* [Excerpt 38].

YEA (Yovantus Eduardus Abut): *"Mastering the problem and finding the problem"* [Excerpt 39] (*ibidem* with footnote 1).

In addition, informants also have a different way of finding issues to be raised in writing scientific articles. Some of them are based on experience, reading books, and even seeing phenomena happening today. This is in line with the following interview results:

IABM (Iko Agustina Boang Manalu): *"From experience, reading, phenomena existed in the middle of society and so on."* (Excerpt 40)

EWD (Elen Witri Daeli): *"Searching for the latest issues that have not been previously raised"* [Excerpt 41].

YEA (Yovantus Eduardus Abut): *"Finding an irony that if the solution is sought, then, it will be beneficial to the people"* [Excerpt 42] (*ibidem* with footnote 1).

After finding the problem to be raised, then, the next thing to do is to make a problem statement. This formulation aims to assist researchers to make the research more focused and unobtrusive. In this case,

all informants make the problem. This is evidenced by the following interviews:

EWD (Elen Witri Daeli): "Yes" [Excerpt 43].

YEA (Yovantus Eduardus Abut): "Yes" [Excerpt 44].

IABM (Iko Agustina Boang Manalu): "Yes" [Excerpt 45] (*ibidem* with footnote 1).

Good scientific articles are scientific articles that have novelty in terms of concepts, methodologies, and conclusions. Factual articles are generally more appealing to readers. In addition, these articles are also useful for further research. It is also acknowledged by all informants, among others, as follows:

EWD (Elen Witri Daeli): "Yes" [Excerpt 46].

IABM (Iko Agustina Boang Manalu): "Yes" [Excerpt 47] (*ibidem* with footnote 2).

Unlike YEA (Yovantus Eduardus Abut) that mentions, as following here:

YEA (Yovantus Eduardus Abut): *"I adopted the concept, the method of the existing theories"* [Excerpt 48] (*ibidem* with footnote 3).

The issues in the article will be resolved appropriately if using an appropriate analysis tool for dissecting and processing the data. The analysis tools include relevant theories and research. This is in line with the following interview results:

IABM (Iko Agustina Boang Manalu): *"Identifying the problem first in order to select the right data analysis tool and tailor it to its research method and its approach"* [Excerpt 49].⁴

Unlike other informants, who mention as following here:

EWD (Elen Witri Daeli): *"By triangulation. After that, writing is done by exposing the data plus the ideas that support the data"* [Excerpt 50].

YEA (Yovantus Eduardus Abut): *"Adjusted to the size of a problem"* [Excerpt 51].⁵

⁴See again, for example, Interview with IABM (Iko Agustina Boang Manalu), a Master' Student of Postgraduate Indonesian Language Education at the UNS (*Universitas Sebelas Maret* or 11th March University) in Surakarta, Central Java, Indonesia. Interview has been conducted at the UNS Campus, on 5th June 2017.

⁵Interview with EWD (Elen Witri Daeli), a Master'

An article should have a brainstorming idea. This is necessary in order for the exposure to be accomplished well. It's supposed to be before you start writing, the researcher draws a draft frame. However, some informants seem to have no such view. This is evidenced by the following interview results:

IABM (Iko Agustina Boang Manalu): *"In order to ensure that the idea is crippling, I am guided by the problem and problem background"* [Excerpt 52].

YEA (Yovantus Eduardus Abut): *"I do not guarantee, but I try to make the claim as possible"* [Excerpt 53].⁶

Meanwhile, only EWD (Elen Witri Daeli) is drafting the conceptual framework before starting to write. This is in line with the following interview results:

EWD (Elen Witri Daeli): *"Creating a concept framework and thinking framework for the research"* [Excerpt 54].⁷

After compiling the framework, the next thing to do is develop the framework. This is to ensure that the ideas contained in the writing are more consistent. Different things were revealed by informants as evidenced by the following interviews:

YEA (Yovantus Eduardus Abut): *"The main topic should dominate the writing to always*

Student of Postgraduate Indonesian Language Education at the UNS (*Universitas Sebelas Maret* or 11th March University) in Surakarta, Central Java, Indonesia. Interview has been conducted at her home, on 15th May 2017; and Interview with YEA (Yovantus Eduardus Abut), a Master' Student of Postgraduate Indonesian Language Education at the UNS (*Universitas Sebelas Maret* or 11th March University) in Surakarta, Central Java, Indonesia. Interview has been conducted at the UNS Campus, on 6th June 2017.

⁶See, for example, Interview with IABM (Iko Agustina Boang Manalu), a Master' Student of Postgraduate Indonesian Language Education at the UNS (*Universitas Sebelas Maret* or 11th March University) in Surakarta, Central Java, Indonesia. Interview has been conducted at the UNS Campus, on 5th June 2017; and Interview with YEA (Yovantus Eduardus Abut), a Master' Student of Postgraduate Indonesian Language Education at the UNS (*Universitas Sebelas Maret* or 11th March University) in Surakarta, Central Java, Indonesia. Interview has been conducted at the UNS Campus, on 6th June 2017.

⁷Interview with EWD (Elen Witri Daeli), a Master' Student of Postgraduate Indonesian Language Education at the UNS (*Universitas Sebelas Maret* or 11th March University) in Surakarta, Central Java, Indonesia. Interview has been conducted at her home, on 15th May 2017.

remember and stick to its rule" [Excerpt 55].

EWD (Elen Witri Daeli): *"Writing the idea is in line with your own planned mind"* [Excerpt 56].

IABM (Iko Agustina Boang Manalu): *"Taking into account the underlying ideas of each paragraph, based on pre-arranged thinking frameworks"* [Excerpt 57] (*ibidem* with footnote 1).

At the point of writing, it should have been the idea that has been developed in the previous stage is illustrated with other relevant theories and research. Furthermore, the researcher is obliged to choose the argument model to be used in order to be a complete essay. Well-qualified articles certainly present a strong argument. However, it seems that informants have different views on this, evident from the following interview results:

IABM (Iko Agustina Boang Manalu): *"Enriching data, create analogies, associate with facts or phenomena"* [Excerpt 58].

EWD (Elen Witri Daeli): *"In each of the ideas, there must be a fundamental idea and an explanatory idea that supports the underlying idea"* [Excerpt 59].

YEA (Yovantus Eduardus Abut): *"Read as many references as possible"* [Excerpt 60] (*ibidem* with footnote 1).

Furthermore, in writing a scientific article, there are times when researchers are confusing even in the argument. This is due to many factors including lack of material or discussion that is too widespread. Every informant has its own way of dealing with it. This is evident from the following interview results:

EWD (Elen Witri Daeli): *"As much as possible using effective sentences"* [Excerpt 61].

IABM (Iko Agustina Boang Manalu): *"Focus on issues and goal-oriented"* [Excerpt 62].

YEA (Yovantus Eduardus Abut): *"Review is the right thing to answer"* [Excerpt 63] (*ibidem* with footnote 1).

The hardest process of writing is if the author is stuck. This usually happens, because of inadequate library studies, errors in choosing model arguments, and so forth. Thus, the author runs out of energy to expose its arguments. There are many ways in which it can be overcome by temporarily

silencing the article while reviewing, looking for references in addition to the emergence of new ideas to strengthen the argument. This is in line with the following interview results:

IABM (Iko Agustina Boang Manalu): “Find other references, discuss it with colleagues or lecturers” [Excerpt 64].

YEA (Yovantus Eduardus Abut): “Looking for inspiration from the various studies that have been done” [Excerpt 65].

EWD (Elen Witri Daeli): “By looking at the existing references” [Excerpt 66] (*ibidem* with footnote 1).

Finally is the post-stage stage. Here is the stage, where the author re-examines the writing. It aims to reduce errors or errors that may arise during writing. All authors do this reflection process. This is evidenced by some of the following interviews:

EWD (Elen Witri Daeli): “Yes” [Excerpt 67].

IABM (Iko Agustina Boang Manalu): “Yes” [Excerpt 68].

YEA (Yovantus Eduardus Abut): “Yes, I checked back” [Excerpt 69] (*ibidem* with footnote 1).

There are many things to look out for in the process of double checking, including the substance of the scholarly article. It seems that some authors think of the same thing. This is evidenced by the following interview results:

IABM (Iko Agustina Boang Manalu): “It’s in line with the framework and answers the problem statement” [Excerpt 70].

EWD (Elen Witri Daeli): “In accordance with the purpose of article writing” [Excerpt 71].

YEA (Yovantus Eduardus Abut): “Read it thoroughly, thoroughly, and repeat” [Excerpt 72] (*ibidem* with footnote 1).

In addition to substance, things to consider next are technical writing and linguistics. All authors as a whole note this, proving from the following interviews:

EWD (Elen Witri Daeli): “It should match each of the predefined styles” [Excerpt 73].

YEA (Yovantus Eduardus Abut): “In accordance with the applicable regulations” [Excerpt 74].

IABM (Iko Agustina Boang Manalu): “Harmonious” [Excerpt 75] (*ibidem* with footnote 1).

In line with other informants, who express the language of each of his/her articles. This is evident from the following interviews:

IABM (Iko Agustina Boang Manalu): “Well, in accordance with the guidelines” [Excerpt 76].

YEA (Yovantus Eduardus Abut): “Adjusted to enhanced spelling” [Excerpt 77].

EWD (Elen Witri Daeli): “Using scientific sentences, effective and in accordance with the existing PUEBI” [Excerpt 78] (*ibidem* with footnote 1).

Based on the results of the above analysis, it can be concluded that IABM (Iko Agustina Boang Manalu) informant chose to plan ahead and identified the relevant factors to understand a problem. In fact, seeing and reading the situation, IABM was able to understand the problem. In the problem-solving process, IABM understands the context of the problem first to identify the constraints that may be encountered, when resolving the problem. The IABM method of applying the concept of knowledge that it has is to look at the problem from various sides to the conical to one conclusion. The IABM informant chooses to discuss and read other references to see the advantages and disadvantages of the strategy he uses in problem solving. The problem solving procedure used by the IABM is to follow the planned phase. At the re-examination stage, IABM sees the suitability of what has been done with the purpose (*cf* Christoph, 2006; Papaleontiou-Louca, 2008; Setyaningsih, 2016; Ardina & Setianingsih, 2017; and IABM, 2017).

At the writing stage, IABM departs from the problem before starting the writing. Generally, the problem IABM find comes from experience, reading, and phenomenon in the middle of society. Furthermore, IABM formulates the problem that she wants to be careful based on novelty in concept, method, and conclusions. In processing the data, IABM chose to adjust the problem with the methods and approaches it will use.

As to ensure the pursuit of his ideas, IABM is guided by the formulation of the pre-arranged issues and develops her essays by taking into account the fundamental ideas in each paragraph. When IABM was dead, she chose to discuss it with a colleague or lecturer and look for other references. To prevent confusion in her research, IABM conducted a re-examination process, both in terms of substance, technical writing, and linguistics (Christoph, 2006; Papaleontiou-Louca, 2008; Setyaningsih, 2016; Ardina & Setianingsih, 2017; and IABM, 2017).

EWD (Elen Witri Daeli) informant also plan and find out the problem background before starting something. In fact, just reading and seeing, EWD situation was able to understand a problem. EWD determines the method of research in the process of solving the problem. In addition, she also compares with other similar studies to see which improved solutions strategy is better. In the re-examination process, EWD verified the results of the research to ensure that the problem has been resolved appropriately (cf Christoph, 2006; Papaleontiou-Louca, 2008; EWD, 2016; Setyaningsih, 2016; and Ardina & Setianingsih, 2017).

Determining the problem that will be raised in an article is what EWD does before starting a writing. In finding the problem, EWD searches for factual things that have never been previously raised in article writing. EWD makes topic formulation and problem formulation, so that the article is more targeted. The tools used by EWD to dissect the data are to use theory triangulation. To help her convey the ideas systematically and systematically, EWD creates a conceptual framework and framework of thinking. Then develop the framework into an elaborative and intact essay. To prevent the argument of the argument, EWD should use the effective sentence. Meanwhile, EWD sees the existing references to prevent the deadlock in writing. EWD also undertakes a process of examining both the substance, the technical writing that is tailored to the style, and language that is based on PUEBI or *Pedoman Umum Ejaan Bahasa Indonesia*/

General Guidelines for Indonesian Spelling (Christoph, 2006; Papaleontiou-Louca, 2008; EWD, 2016; Setyaningsih, 2016; and Ardina & Setianingsih, 2017).

YEA (Yovantus Eduardus Abut) understands a problem by looking at different sides before starting something. He uses his knowledge and experience as a problem solving strategy. In addition, YEA also compares its strategy with other research strategies to see its shortcomings. By following the planning set up from the beginning, YEA believes the solution strategy will work. YEA also conducts reconsiderations based on the preceding stages to ensure that the issues are resolved appropriately and on purpose (cf Christoph, 2006; Papaleontiou-Louca, 2008; Setyaningsih, 2016; Ardina & Setianingsih, 2017; and YEA, 2017).

The thing YEA did before starting to write is to find the problem that will be raised in the research. Then create a problem formulation based on existing concepts and methods. In writing, YEA cannot guarantee the crunch on the writing he creates. So it is difficult to develop the idea completely. YEA focuses only on the main topics and problem formulas to process their writing. Meanwhile, looking for comparisons to other studies is a way of YEA to assess the deadlock in writing. However, in addition all of YEA still does the re-check process to reduce the errors that may arise during writing (Christoph, 2006; Papaleontiou-Louca, 2008; Setyaningsih, 2016; Ardina & Setianingsih, 2017; and YEA, 2017).

Discussion. Writing scientific articles not only presents data, but must be criticized and analyzed. One of them is by displaying a strong and sharp argument not just an unpopular opinion. The ability to write someone is influenced by his/her ability to think. Good thinking activities show good writing skills as well. In arguing, we need to emphasize our position in the issue by raising the claim. For that, before making the hypothesis chain, writer needs to consider alternatives in narrowing the cause of the problem (Bailey, 2011; Mahsa, Setiawan & Rohmadi, 2017; and Setianingsih, 2017).

There are several things that can be judged from the exposure of the argument of a scientific article writer, such as whether the argument presented by the writer is in line with the problem solver; the extent and importance of the problem, whether the arguments described make sense, whether the systematic writer solves the problem; the evidence presented, whether there is ambiguity and bias in its contents, whether the references and methods used are appropriate, and how technical writing and its language rules are appropriate. Some writers may make some mistakes, such as arguments that are too convoluted and irrelevant to the problem (Wade, 1995; Mahsa, Setiawan & Rohmadi, 2017; and Setianingsih, 2017).

Often in writing a scientific article, the argument presented is just a matter of opinion. Of the many arguments, we want to reveal we have to choose one of the best arguments to get the best explanation. This process uses abduction methods (Queiroz & Merrell, 2005; Adian & Pratama, 2013:40; and Mahsa, Setiawan & Rohmadi, 2017). The method is very important in writing scientific articles. Many of the writers, who have been awarded good verbal skills and good systematic arguments also, but arguments are not based only on that, but are measured based on the suitability of arguments with good reasoning principles (Adian & Pratama, 2013; Liunbruno *et al.*, 2013; and Mahsa, Setiawan & Rohmadi, 2017).

Argumentative writing should contain specific and firm arguments on a particular topic (Adian & Pratama, 2013:136; Devries, 2017; and Mahsa, Setiawan & Rohmadi, 2017). That can happen if the author has a good metacognition characterized by good reasoning ability. From the three analyzed data, it is known that the form of metacognition reflected in the argument of the three informants is categorized into two, that is strong and strong enough.

This is in line with the research conducted by J. Qin (2013), which concludes that the ability to write student argument increases after the application of S. Toulmin (2003)'s model. If J. Qin (2013) study focuses only

on the application of S. Toulmin (2003)'s model in the writing ability of the argument, while this study examines the relevance of metacognition and writing ability of the argument. Although both studies used S. Toulmin (2003)'s model to analyze its arguments, the study was far ahead to look for factors of metacognition in the writing of scientific articles. Of course, it has become an advantage in this research (*cf* Toulmin, 2003; Qin, 2013; EWD, 2016; IABM, 2017; Mahsa, Setiawan & Rohmadi, 2017; and YEA, 2017).

The next research was conducted by Ade Cyntia Pritasari, Sri Dwiastuti & Riezky Maya Probosari (2016), which concluded that the ability of the students of X-grade MIA (*Matematika dan Ilmu Alam* or Mathematic and Science) 1 SMA (*Sekolah Menengah Atas* or Senior High School) Batik 2 in Surakarta, Central Java, Indonesia to increase after the application of PBL (Problem-Based Learning) model. The equation of the research with this study is to equally analyze the argument, whereas the difference lies in the model used, if the research uses the PBL model, while this study uses S. Toulmin (2003)'s model. The advantage of this research compared to the research is that this study looks for the relationship between metacognition and argument (*cf* Toulmin, 2003; EWD, 2016; Pritasari, Dwiastuti & Probosari, 2016; IABM, 2017; Mahsa, Setiawan & Rohmadi, 2017; and YEA, 2017).

Finally, research by U. Wingate (2012), which concludes that the ability to write student arguments better after being given intensive teaching by tutor at university. The equation of the research with this research lies in the study of the argument. While the difference lies in the subject of the study. The advantages of this research are compared to the research, this research looks for relevance between metacognition and argument (*cf* Wingate, 2012; EWD, 2016; IABM, 2017; Mahsa, Setiawan & Rohmadi, 2017; and YEA, 2017).

The form of metacognition in the writing of scientific articles has been found, then looking for factors that affect metacognition. Factors affecting metacognition in the writing of scientific articles are divided into

two components, namely: metacognition components and writing components. At the level of metacognition, the three informants have been able to develop their thinking strategy. It is seen from their ability to understand problems, solve problems, and re-examine processes (Lai, 2011; Chick, 2015; and Mahsa, Setiawan & Rohmadi, 2017).

This is in line with what Z. Chairani (2013), and other scholars, revealed that there are four phases in metacognition, i.e. understanding the problem; planning problem solving; problem solving; and checking back. Furthermore, in the writing process, the three informants have been following the pre-writing, writing, and post-stage stages. The most influence stage is pre-writing stage (*cf* Lai, 2011; Chairani, 2013; Chick, 2015; EWD, 2016; IABM, 2017; Mahsa, Setiawan & Rohmadi, 2017; YEA, 2017; and *ibidem* with footnote 1).

This refers also to Yuliana Setyaningsih (2016)'s research, and other scholars, that divided the reality of the argument and the concept of human metacognition into three phases, namely: the pre-authorization phase of the problem-solving consciousness; finding the background of the problem; and formulating the general topic formulation, formulating a specific topic, formulating the problem statement, and the sub-program and others (*cf* Safari & Meskini, 2016; Setyaningsih, 2016; and Mahsa, Setiawan & Rohmadi, 2017).

Furthermore, the writing stage consists of the determination of the argument model, the implementation, and the conception of the argument. Finally, the post-stage stage consists of reflection of substance content, technical writing, and linguistics. Both factors affect the quality of arguments in scientific articles, the better the metacognition of a person is the more qualified the resulting scientific articles (Setyaningsih, 2016; Wischgoll, 2016; and Mahsa, Setiawan & Rohmadi, 2017).

Research on metacognition was previously conducted by S. Demir & F. Sahin (2014), and other scholars, which concluded that knowledge of metacognition has a relation to academic achievement. The

higher the metacognition of the students, the higher their academic achievement. The equation of the study with this study is to study both metacognition. While the difference is that the study analyzes the relationship of metacognition and academic achievement, while this study examines the relevance of metacognition and argument (Hrbapkova, Hladik & Vavrova, 2012; Demir & Sahin, 2014; EWD, 2016; IABM, 2017; Mahsa, Setiawan & Rohmadi, 2017; and YEA, 2017).

Based on the above discussion, it can be said that the Postgraduate student of Indonesian Language Education at the UNS (*Universitas Sebelas Maret* or 11th March University) in Surakarta, Central Java, Indonesia has been consciously aware of the writing of scientific articles. This is evidenced by its metacognitive form that is strong and strong enough and fulfills all the stages contained in the factors affecting metacognition in the writing of scientific articles (*cf* Lai, 2011; Chick, Nancy, 2015; EWD, 2016; IABM, 2017; Mahsa, Setiawan & Rohmadi, 2017; and YEA, 2017).

CONCLUSION

Based on the results of the research, it can be concluded that the form of metacognition in the writing of scientific articles of Postgraduate students of Indonesian Language Education at the UNS (*Universitas Sebelas Maret* or 11th March University) in Surakarta, Central Java, Indonesia is categorized into two, that is strong and fairly strong. Two informants are strongly categorized, because they contain the basic elements of C (Claim), G (Ground), and W (Warrant) and support element in the form of B (Backing). Meanwhile, another one is categorized strong enough, because it only contains the main element in the results and discussion section. It can be argued that the scientific articles of the three quality informants are credible and recognized legitimacy.

Factors affecting metacognition in the writing of scientific articles of Postgraduate students of Indonesian Language Education at the UNS in Surakarta, Central Java,

Indonesia is characterized by two stages, namely: metacognition stage and writing stage. At metacognition level, the three informants were able to develop their thinking strategy. It is seen from their ability to understand problems, plan problems, solve problems, and check back. Meanwhile, in the process of writing, the three informants have been following the pre-writing, writing, and post-stage stages. The most influence stage is pre-writing stage. Both of these factors affect the quality of the arguments in the article, the more mature the planning, and the suitability of the strategies used then the more qualified the scientific articles produced.

This research is useful for the development of science. One in language learning. In writing skills, S. Toulmin (2003)'s model can be used as a new alternative to measure the extent of writing arguments. In addition, the relevance of metacognition and argument gives new ideas to future researchers that there is a connection between the ability to write arguments with one's thinking ability. For that, it is hoped that there will be further research related to it.⁸

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(Source: <https://io.uns.ac.id/>, 20/5/2018)

The form of metacognition in the writing of scientific articles of Postgraduate students of Indonesian Language Education at the UNS (*Universitas Sebelas Maret* or 11th March University) in Surakarta, Central Java, Indonesia is categorized into two, that is strong and fairly strong. Two informants are strongly categorized, because they contain the basic elements of C (Claim), G (Ground), and W (Warrant) and support element in the form of B (Backing). Meanwhile, another one is categorized strong enough, because it only contains the main element in the results and discussion section. It can be argued that the scientific articles of the three quality informants are credible and recognized legitimacy.