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Research Article

Needs Analysis: Students' University Learning in Writing Scientific Papers

Ninit ALFIANIKA[1], Dadang SUNENDAR[2], Andoyo SASTROMIHARJO[3], Vismaia S. DAMAIANTI[4]

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Abstract

This study aims to analyze the learning needs of students in writing scientific papers. This type of research is a qualitative study using descriptive analysis methods. Participants used in this study were 38 students and 4 lecturers who taught writing scientific papers. Students and lecturers are spread across 4 universities in West Sumatra, Indonesia. Data in this study were obtained from tests, questionnaires, and interview guidelines. Data is collected by providing material tests for writing scientific papers. Next, give a questionnaire to write scientific papers to students. Finally, conducting interviews with students and lecturers related to learning needs in writing scientific papers. Data were analyzed using content analysis methods. The results showed that based on the point of view of teaching materials, the learning needs of students in writing scientific papers are the main ingredients of systematic writing in scientific articles, examples of scientific articles, references relating to scientific papers. From the point of view of the learning model, the learning needs of students in writing scientific papers are fun learning, providing freedom, motivation, imagination, creativity, logical thinking, direct practice, and lecturer guidance. From the point of view of evaluating learning, the learning needs of students in writing scientific papers are direct evaluations in facing obstacles to learning and evaluations that are carried out together. Therefore, students have various needs in writing scientific papers.

Keywords:

needs analysis, learning in writing scientific papers, students

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[1]

[1] Study Program of Indonesian Language, School of Postgraduate Universitas Pendidikan Indonesia, Bandung, Indonesia. E-mail:.ninitalfianika@gmail.com, ORCID ID: 0000-0002-8547-0372;
[2] Corresponding Author: dadang@upi.edu, ORCID ID:0000-0001-6008-0979;
[3] andoyo@upi.edu, ORCID ID:0000-0002-2711-0328;
[4] vismaia@upi.edu, ORCID ID: 0000-0002-2660-5628.

Introduction

Writing scientific papers is one of the requirements for students if they wish to obtain a bachelor's degree (Ministry of Education and Culture, 2012; Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 49, 2014). Therefore, writing scientific papers is a compulsory subject for Indonesian language and literature education majors. Scientific writing is the result of writing describing the knowledge gained from research results (Jauhari, 2013; Syaefullah, 2015). Writing scientific papers is one of language skills that requires students to express ideas and ideas that its truth can be proven (Alfianika, Nofasari, & Marni, 2018). Based on the standards of the Indonesian National Qualifications Framework, the output of writing scientific papers course is producing scientific papers in the form of scientific articles. Scientific articles are one of the simplest scientific papers, both from the selection of titles, systematic writing and the content is simpler than existing scientific papers (Jauhari, 2013). Systematics of writing scientific articles uses IMRAD format, namely introduction, method section, results section, and discussion. The introduction contains the reasons for doing the research and is justified by appropriate science and references (Ecarnot, Seronde, Chopard, Schiele, & Meneveau, 2015).

Writing scientific articles is also important for other countries. In other countries writing scientific papers is used for career and academic development. Writing scientific papers and publishing is the key to career development and academic success for surgeons at the University of California, San Francisco (UCSF) (Derish, Maa, Ascher, & Harris, 2007). Writing and publishing scientific articles is also a talk in other countries. Writing and Publishing Scientific Papers (El–Serag, 2012). How to write really good articles for premier academic journals. This articles summaries our thoughts on how to improve one's publishing success (LaPlaca, Lindgreen, & Vanhamme, 2018). Journal publishing challenges: A case of STM scientific journals in Croatia. Speedy publication of articles is important for faster access to the accumulated scientific knowledge (Vrana, 2012). This shows that writing scientific papers is really needed by all countries. Especially people who are in the academic realm.

The results showed the average ability to write scientific papers was at a sufficient stage. The average ability to write scientific papers of Bachelor degree students in the study program of Indonesian language and literature education, Faculty of Teacher Training and Education, University of Bengkuluis was in the poor category (Yanti, Suhartono, & Hiasa, 2018). The average ability to write scientific papers from Indonesian language study programs and literary education in Padang in the category of more than enough. (Alfianika, Sunendar, Sastromiharjo, & Damaianti, 2019).

The first step that can be taken to overcome these problems is to conduct a needs analysis. Needs analysis was first introduced in India in 1920 (West, 1994). Requirement analysis is the process carried out to obtain information. Needs analysis

can be used for various purposes (Pushpanathan, 2013). Needs analysis is an information gathering activity as a basis for developing something that can meet the needs of groups of students (Songhori, 2008). There are two types of needs, namely objective needs and subjective needs. Objective needs are related to factual information about students, while subjective needs are related to cognitive and affective needs in learning (Brindley, 1989). Learning is the process of student interaction with lecturers and learning resources in a learning environment (Law of the Republic of Indonesia Number 20, 2003; Law of the Republic of Indonesia Number 44, 2015). The learning process is a curriculum implementation activity in an educational institution so that students can be able to achieve learning objectives (Sudjana, 2010).

Needs analysis can be seen from the standpoint of teaching, history, theoretical foundation, approaches, and other things (West, 1994). Based the teaching point of view, needs analysis can be done from the teaching materials, teaching models, and evaluations used. Teaching material is one of the important components in the learning process (Irawati & Saifuddin, 2018). Teaching material is one component that can help fluency in learning (Pateliya, 2013). Teaching material can also be interpreted as a form of material used by lecturers in carrying out learning activities (Prastowo, 2012). Learning models can be defined as a conceptual framework that describes a systematic procedure in organizing learning experiences to achieve learning goals (Suprijono, 2010). The model of teaching can be defined as instructional design, which describes the process of specifying and producing particular environmental situations, which cause the students to interact in such a way that a specific change occurs in their behavior (Pateliya, 2013). In learning, evaluation is one of the important components and stages that must be taken to determine the effectiveness of learning. The test is basically part of the evaluation system itself (Arifin, 2012). Learning evaluation of basically does not only assess learning outcomes, but also the processes that educators and students go through in the whole learning process (Asrul, Rusydi, & Rosnita, 2015).

Needs analysis of this study is seen from the point of view of teaching, namely teaching materials, learning models, and learning evaluation. The analysis refers to the theory used by West 1994. Needs analysis is new research in the field of language teaching (Gusti, 1999). Needs analysis in learning to write scientific papers has never been done before. However, there are several similar studies, which are as follows. Needs analysis in learning to write scientific papers has never been done before. However, there are several similar studies, which are as follows. Analysis of the learning needs of tools for specialist nurses (Forbes, While, & Ullman, 2006), analysis of learning needs for higher order thinking skills (Heong et al., 2012), needs analysis of argumentative writing learning (Bipinchandra et al., 2014), analysis of the language needs of Turkish students, (Adiyaman, Çangal, & Yazıcı, 2018), analysis of learning needs for risk literacy education (Sata & Nara, 2017), pharmacist learning needs

(Schindel et al., 2019), analysis of learning needs of specialist practitioners of spine and spinal tissues (McIlroy, Payne, Pickford, & King, 2019). In contrast to previous research, this needs analysis research is more focused on the field of teaching writing scientific papers. Needs analysis is done because there are problems students write scientific papers. Problems often experienced by students in writing scientific papers, namely writing titles, keywords, methodology, results, conclusions, and reference lists. Therefore, the purpose of this study is to describe the needs of students at universities in learning to write scientific papers.

Method

Research Model

This type of research was a qualitative study using descriptive analysis method. Description analysis method was used to describe and analyze data related to the needs of students' learning in writing scientific papers. The hallmark of qualitative research is analyzing data that describes the text to interpret meaning (Creswell, 2012). Descriptive analysis method is used to analyze the needs of students writing scientific papers. The needs analysis conducted is related to the analysis of teaching materials, learning models, and learning evaluation. The data source in this study were students of Indonesian literature and education in 4 tertiary institutions in West Sumatra.

Participants

This research was conducted on 38 students of Indonesian language and literature education and 4 lecturers who taught writing scientific papers course. Students and lecturers who are participants are spread in 4 universities in the city of Padang. Higher education institutions, which are used as research sites, namely public and private universities. The criteria in selecting tertiary institutions are as follows. (1) Higher education institutions that have writing scientific papers course. (2) Higher education institutions, which major in Indonesian language and literature education. (3) Higher education institutions that have students from various regions. (4) Higher education status is public and private. The two different campus statuses are used to see the differences in the learning process of writing scientific papers.

Table 1.

Demographic Structures of Participants

Variable	Demographic feature	f	%
Gender	Female	34	80,95
	Male	8	19,05
Job	Students at the University	38	90,47
	Lecture	4	9,53

Data Collection

The data in this study were obtained from tests, questionnaires, and interview guidelines. Data was collected by giving scientific writing tests to students. Based on the test results, weaknesses or problems of students in writing scientific work concepts were obtained, so that from these weaknesses what students need related to concepts in learning to write scientific papers. After the test was given, the next step was distributing questionnaires to students. The questionnaire was given with the aim of obtaining data on the needs of students in writing scientific papers. The final step was conducting interviews with lecturers and students. Interviews were conducted as supporting data on tests and questionnaires that had been filled out by students. In addition, interviews with lecturers are conducted with the aim of obtaining the need to write scientific papers from the point of view of the instructor or lecturer. Data collection to lecturers was done by interviewing lecturers related to the needs in learning in writing scientific papers. Discussing the needs of students not only from the perspective of an educator but also of students (Karimi & Sanavi, 2014).

Data Analysis

Descriptive data analysis was performed with the aim of obtaining the needs of students in writing scientific papers. Analysis of the data in the description was obtained from quantitative and qualitative data. The quantitative data analysis (tests and questionnaires) was carried out descriptively as follows. (1) Checking the student questionnaire and test results based on the specified assessment rubric. (2) Processing the questionnaire scores and test results into grades using the formula for looking up grades. (3) Finding the average value of the questionnaire results and the value of the test results by using the formula of looking for an average. (4) After the average was obtained, the next step describes the data obtained based on the research problem formulation. (5) After the description of the data, the next step was to make a conclusion in the form of a research report. A complete descriptive qualitative data analysis (interview results) was carried out as follows. (1) Record all the interview data in accordance with the research objectives. (2) Furthermore, the data was classified according to the purpose of the study. (3) After the data was classified, data analysis was performed and conclusions were drawn based on data analysis conducted. Descriptive analysis was done by recording data, data presentation, drawing conclusions, and verification (Miles, Huberman, & Saldaña, 2014).

Results

Research findings was obtained from the results of tests, questionnaires, and interviews. The research findings obtained are related to the needs of students in writing scientific papers. The needs analysis conducted was seen from the point of

view of teaching, namely teaching materials, learning models, and learning evaluation. The findings are more fully explained as follows.

Based on the analysis of test data, it was found that some of the students' needs regarding learning material for writing scientific papers. The needs of students for learning material to write scientific papers, are as follows (1) The concept of research problems with the percentage of needs of 56.14%. (2) The concept of abstract of the article with the percentage needs of 52.63%. (3) The concept of writing an article title with the percentage needs of 81.58%. (4) The concept of writing keywords with the percentage needs of 81.58%. (5) The concept of article introduction with the percentage needs of 73.68%. (6) The concept of article research objectives with the percentage needs of 75.00%. (7) The concept of article research methodology with the percentage of needs 60.53%. (8) The concept of literature with the percentage needs of 78.95%. (9) The concept of writing the conclusions of the article with the percentage needs of 68.42%. The need for the concept of the material was used as a foundation in the development of teaching materials or learning materials in writing scientific papers. The details of the needs of students' learning in writing scientific papers can be seen in the following table.

Table 2.
The Needs of Students' Learning in Writing Scientific Papers (Tests)

Number	Materials Needs for Writing Scientific Papers	The percentage of
1	The need research problem	56,14%
2	The need for concept abstract	52,63%
3	The need for concept of title	81,58%
4	The need for concept of keyword	81,58%
5	The need for concept of introduction	73,68%
6	The need for concept of research objectives	75,00%
7	The need for concept of research methodology	60,53%
8	The need for concept of literature	78,95%
9	The need for concept of conclusion	68,42%

Based on the analysis of questionnaire data, several needs of students' learning in writing scientific papers. The needs of students' learning in writing scientific papers are as follows. (1) Students need fun learning in writing scientific works. (2) Students need freedom in learning and determining the topic to be written. (3) Students need motivation in finding ideas in learning to write scientific papers. (4) Students need learning methods and media that can support learning to write scientific papers. The explanation of data findings from the questionnaire instruments can be seen in the following table.

Table 3.
Student Needs in Learning to Write Scientific Papers (Questionnaire)

Number	Learning Needs for Writing Scientific Papers
1	Students need fun learning to write scientific work.
2	Students need freedom in learning and determining the topics to be written.
3	Students need motivation in finding ideas in learning to write scientific papers.
4	Students need learning methods and media that can support learning to write scientific papers.

Based on the data analysis of the interviews results with students and lecturers, some needs of students' learning in writing scientific papers were found. The needs of students' learning in writing scientific papers are as follows. (1) Based on teaching materials, students need the following. (a) Students need systematic material for writing scientific articles. (b) Students need teaching materials that are equipped with examples of scientific articles on the results of research. (c) Students need references to write many scientific papers. (2) Based on the learning model, students need the following. (a) Students need learning that gives freedom to students, both freedom in choosing written ideas and freedom in solving problems in learning. (b) Students need a learning model that can foster imagination, creativity, and logic in thinking to encourage students in writing. (c) Students need learning that is oriented to practice in writing scientific articles compared to concepts. (d) Students need guidance or direction from lecturers in learning to write scientific articles. (3) Based on the evaluation, students need the following. (a) Students need an learning evaluation that is done together. (b) Students need an evaluation that is immediately carried out after learning ends. The details of the student needs findings from the interview guidelines can be seen in the following tabs.

Table 4.
The Needs of Students' Learning in Writing Scientific Papers (Interview Guide)

Number	Point of Views	Learning Needs for Writing Scientific Papers
1	Learning Materials	a) Students need systematic material to write scientific articles. b) Students need teaching materials that are equipped with examples of scientific articles on the results of research. c) Students need a lot of references related to writing scientific papers.
2	Learning model	a) Students need learning that gives freedom to students, both freedom in choosing written ideas and freedom in solving problems in learning. b) Students need a learning model that can foster imagination, creativity, and logic in thinking so as to encourage students to write.

		c)	Students need learning that has little understanding of concepts, but directly practices writing scientific articles.
		d)	Students need guidance or direction from lecturers in learning to write scientific articles.
3	Learning Evaluation	a)	Students need an learning evaluation that is done together.
		b)	Students need an evaluation that is immediately carried out after learning ends.

In addition, the needs of students in learning to write scientific papers can be proven from the following interview results.

"Learning material is needed in learning to write scientific papers, namely writing systematic scientific articles" (Student 1)
"In addition to understanding the material, sample articles are also urgently needed" (Student 5).
"Interesting learning, direct learning to practice without a lot of theory" (Student 10).
"Evaluation of learning must be done after learning is completed. Evaluation is carried out jointly between students and lecturers" (Student 20).

Based on the results of the interview, it appears that the needs of students in writing scientific papers. In general, theories are needed by students in writing scientific papers, namely systematic in writing scientific articles. In addition, students need more direct learning to practice without having to have a lot of theory. Likewise with evaluation, evaluation must be done directly in learning.

Discussion and Conclusion

This section explained the discussion relating to the needs of students in writing scientific papers. The discussion is carried out from 3 points of view, namely teaching materials, learning models, and learning evaluation. The discussion of these three matters is explained as follows. Based on the teaching material viewpoint, students' needs are related to teaching materials for writing scientific papers. Writing material for scientific papers that was most needed by students is the systematic writing of scientific articles, including writing article titles, the concept of writing of abstract, the concept of writing of keyword, the concept of writing of introduction, concept of research objectives, the writing concept of a research methodology, the concept of writing a conclusion, and the concept of writing literature. Systematics of writing scientific articles varies, depending on the intended journal. It is better for a writer to systematically adjust the writing of scientific articles with the intended journal template. Systematics of writing scientific articles using IMRAD format consist of introduction, method section, results section, and discussion (Ecarnot et al., 2015).

In addition to systematic material, students need examples of scientific articles themselves. By the example, students can see firsthand how the systematic concept of the article itself. In learning English, the material most needed by students is speaking and writing related to vocabulary and paragraphs (Diana & Mansur, 2018). Furthermore, students also need many references to write scientific articles. With a lot of references provided, students will have various reading material. With a lot of reading, knowledge, ideas, and creativity will come naturally. Reading source books, both original and manual books is a necessity for language learning (Karimi & Sanavi, 2014). Reading activities can affect the memory of high school students (Kömek, Yağız & Kurt, 2015).

Based on the learning model viewpoint, the needs of students are related to learning models for writing scientific papers. Students need fun learning. Preparing fun learning can increase students' understanding of learning. Fun learning can improve one's understanding and memorization skills (Rambli, Matcha, & Sulaiman, 2013). Fun and enjoyment of learning carried out with enthusiasm can optimize learning outcomes (Lucardie, 2014). Fun learning is more emphasized on interactive learning. Writing learning should be done in the form of games (Sheridan & Hart-Davidson, 2008).

Students need learning that gives freedom to students, both freedom in choosing written ideas and freedom in solving problems in learning. For students, the freedom of determining ideas is one of the determinant factors that influences the success of what is written. Difficulty in understanding ideas causes students difficulty in completing assignments (Heong et.al., 2012). Therefore, in the learning process, students are required to understand new ideas that can add or complete previous knowledge (Mayer, 2002). It can be better if an educator gives encouragement to students to do what they want as long as it is beneficial. Educators provide support in accordance with the wishes of students (Shen, Carter, & Zhang, 2019).

Students need motivation in learning. The motivational approach provides direction on how to shape meaningful learning for student life. Through motivation and cognitive strategies greatly help success in learning (Lin, Zhang, & Zheng, 2017). Motivation is not only given by the teacher or lecturer, but providing motivation is also important to do by parents. The influence of parents is one of the factors driving the learning process (Calafato & Tang, 2019). Lecturers, teachers, or parents can collaborate language, motivation, and psychology in providing motivation to learn languages (Harvey, 2017).

Students need a learning model that can foster imagination, creativity, and logic in thinking so that it encourages students to write. Thinking logically and motivating yourself is very important for someone to improve achievement in school (Lubis, 2017). The ability to think logically is the cognitive ability that most influences student success (Sezen & Bülbül, 2011). By using logical thinking, students can understand reality and make conclusions to solve everyday problems. The results

showed that solving everyday problems was thought to be influenced by cognitive style and logical thinking (Pezzuti, Artistico, Chirumbolo, Picone, & Dowd, 2014). Therefore, logic is very necessary in learning to write scientific papers.

Students need learning methods that do not have much understanding of concepts, but directly practice writing scientific articles. Learning is usually done in the form of discussion. Learning forms of discussion are more emphasized on the conceptualization of material concepts. The selection and use of learning strategies or methods greatly affect learning outcomes (Clarke & Hennig, 2013). Therefore, understanding of lecturers or teachers is needed in choosing the right learning method. In the selection of methods, teachers or lecturers can consider, learning objectives, motivation, and trends of students (Byrne, Flood, & Willis, 2002; Karimi & Sanavi, 2014). Learning strategies help learners become more aware of the effectiveness of learning and help control learning effectiveness how to learn. Independent students are considered to have been able to develop several learning strategies and are able to control the way of learning (Bajrami, 2015).

Students need guidance or guidance from lecturers in learning to write scientific articles. The role of the teacher is very important to support the entire teaching and learning process (Forsström, 2019). The learning process depends on the interaction between the teacher and students (Engeström & Sannino, 2012). Teacher involvement in learning positively influences the effectiveness of learning activities (Cviko, McKenney, & Voogt, 2014). The teacher's role is very important in helping students develop autonomy and management in learning (Bajrami, 2015).

Based on the learning evaluation viewpoint, student needs related to the learning evaluation to write scientific papers. Students need a learning evaluation that is directly carried out during the learning process. Whenever there are problems or obstacles in learning, lecturers and students immediately conduct an evaluation together. Learning evaluation is an alternative assessment that can maximize learning success (Lee, Mak, & Yuan, 2019). Evaluation greatly influences learning outcomes because evaluations can provide information about learning progress (Watkins, Dahlin, & Ekholm, 2005). The success of learning depends not only on the evaluation given, but also the quality of the evaluation (assessment, examination questions, assignments, criteria, score reports, procedures, feedback, programs, and policies) itself (Gerritsen-van Leeuwenkamp, Joosten-ten Brinke, & Kester, 2017; Gerritsen-van Leeuwenkamp et al., 2017). Therefore, don't be mistaken in giving an evaluation.

Based on the discussion conducted, it can be concluded that the needs of students in writing scientific papers are as follows. (1) Based on the teaching materials viewpoint, the needs of students in learning to write scientific papers, namely a) the material most students need is systematic writing of scientific articles. b) Students need examples of scientific articles. c) Students need a lot of references related to scientific papers. (2) Based on the learning model viewpoint, the needs of

students in learning to write scientific papers, namely a) Students need fun learning. b) Students need learning that gives freedom to students. c) Students need motivation in learning. d) Students need a learning model that can foster imagination, creativity, and logic in thinking. e) Students need learning methods that do not have much understanding of the concept, but practice right away. f) Students need lecturer guidance or guidance. (3) Based on the learning evaluation viewpoint, the needs of students in learning to write scientific papers, namely a) Students need an learning evaluation that is directly carried out during the learning process. b) Students need an evaluation to be done together.

Based on the research results obtained, further research is needed. Further research can be done, related to development. Development that can be done based on needs analysis, namely the development of instructional materials, the development of learning models, and the development of evaluation tools. The development was carried out based on the results of the needs analysis from this study.

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Biodata of the Authors

Ninit Alfianika, M. Pd., was born in Empag Teras, Painan. She graduated from Master Program in Indonesian Language and Literature Education Study in 2014. She is currently studying as an Indonesian language doctoral program student at Indonesian Education University, (UPI) Bandung.
Affiliations: Indonesian Education University, Bandung
E-mail: ninitalfianika@gmail.com, **Phone:** 085274647071

Prof. Dr. Dadang Sunendar, M.Hum., was born in Tasikmalaya, West Java. He is a lecturer and researcher at the Faculty language and of Literature, Indonesian Education University, Bandung, West Java.
Affiliations: Indonesian Education University, Bandung
E-mail: dadang@upi.edu, **Phone:** 081321013363

Dr. Andoyo Sastromiharjo, M.Pd.., was born in Cirebon, West Java. He is a lecturer and researcher at the Faculty language and of Literature, Indonesian Education University, Bandung, West Java.
Affiliations: Indonesian Education University, Bandung
E-mail: andoyo@upi.edu, **Phone:** 08125236962

Dr. Vismaia S. Damaianti, M. Pd., was born in Bandung, West Java. He is a lecturer and researcher at the Faculty language and of Literature, Indonesian Education University, Bandung, West Java.
Affiliations: Indonesian Education University, Bandung
E-mail: vismaia@upi.edu, **Phone:** 081320574924

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