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The Role of Managers' Compensation in the Relationship Between Integrated Reporting and Firm Value

Kartika Sukma Wardhani ^{a)}, and Evy Rahman Utami ^{b)}

Department of Accounting, Faculty Economics and Business, Universitas Muhammadiyah Yogyakarta, Indonesia

Email: kartikasukmawardhani@gmail.com^{a)}; evy.rahman@umy.ac.id^{b)}

ABSTRACT

Currently, financial reports alone are considered not to reflect the company's condition, so other information is needed to meet investors' needs. Then, integrated reporting appears, which contains company information, including both financial and non-financial information. Integrated reporting uses integrated information to increase firm value, which attracts investor interest. This research aims to analyse the influence of integrated reporting on firm value, the influence of manager compensation on firm value, and whether manager compensation can moderate the influence of integrated reporting on firm value. The population in this research includes all companies listed on the Indonesia Stock Exchange (BEI) for the 2022 period. The purposive sampling method selects 486 companies that meet the criteria for this research. This research relies on descriptive statistics and hypothesis testing. The research results show that integrated reporting does not affect firm value because integrated reporting is considered to require large costs and takes a long time to prepare. The test results in this study also show that manager compensation has no effect on firm value, and manager compensation does not strengthen the relationship between integrated reporting and firm value because the manager's offer makes the manager only fulfil it, not aiming to increase firm value to attract investors.

Keywords: Integrated Reporting, Managers' Compensation, Firm Value, Firm Size.

ABSTRAK

Saat ini laporan keuangan saja dinilai belum mencerminkan kondisi perusahaan sehingga diperlukan informasi lain untuk memenuhi kebutuhan investor. Kemudian muncul pelaporan terintegrasi yang memuat informasi perusahaan baik informasi keuangan maupun non keuangan. Pelaporan terintegrasi menggunakan informasi terintegrasi untuk meningkatkan nilai perusahaan sehingga menarik minat investor. Penelitian ini bertujuan untuk menganalisis pengaruh pelaporan terintegrasi terhadap nilai perusahaan, pengaruh kompensasi manajer terhadap nilai perusahaan, dan apakah kompensasi manajer dapat memoderasi pengaruh pelaporan terintegrasi terhadap nilai perusahaan. Populasi dalam penelitian ini meliputi seluruh perusahaan yang terdaftar di Bursa Efek Indonesia (BEI) periode 2022. Metode purposive sampling memilih 486 perusahaan yang memenuhi kriteria penelitian ini. Penelitian ini mengandalkan statistik deskriptif dan pengujian hipotesis. Hasil penelitian menunjukkan bahwa pelaporan terintegrasi tidak berpengaruh terhadap nilai perusahaan karena pelaporan terintegrasi dinilai membutuhkan biaya yang besar dan waktu penyusunan yang lama. Hasil pengujian pada penelitian ini juga menunjukkan bahwa kompensasi manajer tidak berpengaruh terhadap nilai perusahaan, dan kompensasi manajer tidak memperkuat hubungan antara pelaporan terintegrasi dengan nilai perusahaan karena tawaran manajer membuat manajer hanya memenuhinya saja, tidak bertujuan untuk meningkatkan nilai perusahaan kepada perusahaan. menarik investor.

Kata kunci: Integrated Reporting, Kompensasi Manajer, Nilai Perusahaan, Ukuran Perusahaan.

INTRODUCTION

The business world's development has an impact on the sustainability of companies. Companies realise value creation through relationships between company resources and stakeholders (Fuadah et al., 2022). Currently, financial reports are considered no longer sufficient to reflect the different dimensions of the firm (Abogazia et al., 2022; Al-Issa et al., 2022) and provide complete information to report users, so companies try to meet the needs of report users by providing voluntary disclosure. The International Integrated Reporting Council (IIRC) creates basic reporting reference forms to meet the needs of report users regarding both financial and non-financial information. Integrated reporting is a new type of company report that focuses on financial

reporting and company sustainability (Kannenber & Schreck, 2019). Suryati & Murwaningsari (2022) investigated the report's disclosed information that has the potential to impact the firm's value. This research aims to analyse the influence of integrated reporting on firm value, the influence of manager compensation on firm value, and whether manager compensation can moderate the influence of integrated reporting on firm value.

The issue of the relationship between voluntary report disclosure and firm value has been researched for quite some time (Diantimala et al., 2022), but there is still debate. Several previous studies have shown that integrated reporting (IR) influences firm value (Al-Issa et al., 2022; Handayani et al., 2022; Islam, 2020; Salvi et al., 2020; Utomo & Machmuddah,

2021). Literature studies show that integrated reporting does not influence firm value (Ashilah & Suryani, 2021; Nurkumalasari et al., 2019; Suryati & Murwaningsari, 2022; Wahl et al., 2020). Preparing integrated reports requires a large amount of money, which allows the entire organisation to be involved in the internal change process, which takes up time and human resources, as well as external ones, such as consulting and assurance services, thereby making companies consider integrated reporting (Bananuka et al., 2019). Companies going public receive attention from the public regarding their operational activities, so voluntary disclosure of information is required (Sembiring, 2005) so that they incur costs to disclose information (Marfuah & Cahyono, 2011). Therefore, this research aims to answer the inconsistencies in the results of the relationship between integrated reporting and firm value.

The information contained in integrated reporting can show the company's performance. Managers' integrated reporting creates firm value (Jihene & Moez, 2019; Utomo & Machmuddah, 2021). Managers are assumed to represent shareholder involvement (controlling or non-controlling interests) in company operations, so compensation is an internal corporate governance issue that influences managers' responses (Kartadjumena & Rodgers, 2019). Manager compensation's role is to motivate managers to work in the company, look for ways to gain profits (Azmi & Aprayuda, 2021; Lee & Hwang, 2019), and increase the firm value (Park & Byun, 2022) because compensation equivalent to the manager's achievements is given as an incentive to carry out their duties (Utomo & Machmuddah, 2021). Manager compensation payment contracts are prepared based on performance in accounting information system assessments (Daryaei et al., 2022). The higher the manager's performance in the company, the higher the compensation he will get (Song & Wan, 2019), so he can motivate managers to create added value for the company through integrated reporting. As a result, researchers included manager compensation as a moderating variable.

Research on integrated reporting requires more than one theory to explain integrated reporting disclosures (Lakhani & Herbert, 2022). The theory used in this research is the signalling hypothesis. Previous research on voluntary reporting used signalling theory (Anna & Dwi R.T, 2019; Budiana & Budiasih, 2020; Farhana & Adelina, 2019; Hulasoh & Mulyati, 2022; Nurkumalasari et al., 2019). The signalling theory explains that implementing integrated reporting can increase firm value. Integrated reporting brings together material information about strategy, governance, performance, and organisational perspectives in a way that reflects the commercial, social, and environmental context of company operations (Di Vaio et al., 2020). This study aims to examine the effect of integrated reporting on firm value, with manager compensation acting as a moderator.

This research has several contributions to further knowledge and literature, corporate managers, and governments. First, for further literature, this research can increase knowledge or references and become the basis for further writing regarding integrated reporting, firm value, and manager compensation. Second, this research can serve as a valuable resource for company management to enhance their understanding of manager compensation policies within their organisations. Third, government regulators can use this research as material for consideration when preparing voluntary disclosure regulations or integrated reporting.

LITERATURE REVIEW

1. Integrated Reporting and Firm Value

Integrated reporting is a voluntary disclosure used to gain support and trust from investors and the public (Budiana & Budiasih, 2020). The existence of integrated reporting as a voluntary disclosure by the company is expected to be able to help report users and the public obtain information about the company. Integrated reporting not only contains financial information but also non-financial information. According to the International Integrated Reporting Council (2013), integrated reporting contains information about the company's short, medium-, and long-term strategy.

Implementing a sustainable strategy is a sign that the company maintains a balance between the environment, human resources, development, and socially responsible behaviour (Arianpoor & Salehi, 2021; Carp et al., 2019). Integrated reporting, which contains the implementation of sustainable strategies and presents information about company activities while paying attention to the surrounding environment, will attract the public's attention to accept and support the company. Budiana & Budiasih (2020) explain that in signal theory, a company's ability to manage resources to benefit the company is considered a good signal that will provide positive value. Integrated reporting discloses information such as company conditions reflected in share prices, which influence firm value, thereby signalling good news to stakeholders or report users. Stakeholders, particularly investors, interpret this signal as an improvement in the company, thereby influencing investors' decision-making (Suryati & Murwaningsari, 2022). Research by Abogazia et al (2022), Chouaibi et al. (2022), and Utomo & Machmuddah (2021) demonstrate that integrated reporting positively impacts firm value. Therefore, we propose the following as our first research hypothesis:

H1: Integrated reporting has a positive effect on firm value

2. Managers' Compensation and Firm Value

Managers possess the authority to establish company policies that enhance the company's performance, thereby determining their compensation (Azmi & Aprayuda, 2021). The media debate highlights the high level of executive remuneration that is worth paying to improve company performance and avoid a decline in company finances (Kartadjumena & Rodgers, 2019). The decline in company finances is caused by the fact that compensation shares a

portion of the company's profits, as boosting the company's future value yields only minor gains (Lee & Hwang, 2019).

The company expects managers' compensation to motivate them to manage the company effectively. Managers are responsible for company operations and increasing firm value through increasing share prices. Managerial incentives play a role in linking manager welfare and firm value (Jihene & Moez, 2019). According to signal theory, the obtained compensation motivates managers to enhance their skills in increasing firm value, thereby serving as a positive signal. Previous research conducted by Park & Byun (2022) shows that manager compensation influences firm value. Therefore, we propose the second hypothesis in this research:

H2: Managers' compensation has a positive effect on firm value.

3. The Moderating Role of Managers' Compensation

Management's perception of future company improvements can influence investment decisions based on signal theory (Suryati & Murwaningsari, 2022). Reporting sustainable activities that benefit the company, such as improved reputation, increased profits, resource efficiency, or improved brand image, is considered a positive signal or good news in integrated reporting (Biloslavo et al., 2020). Managers prepare voluntary reporting, such as integrated reporting, to attract the public's interest in investing their money in the company. Integrated reporting brings together material information about strategy, governance, performance, and organisational perspectives in a way that reflects the commercial, social, and environmental context of company operations (Di Vaio et al., 2020).

Executives gain large amounts of profit through various activities based on the policies created (Azmi & Aprayuda, 2021). Manager compensation is able to strengthen the activities carried out by the company to create long-term, sustainable value for stakeholders (Lee & Hwang, 2019) and encourage efforts to improve company performance (Azmi & Aprayuda, 2021). Companies make various efforts to manage the company. Companies must be able to control financial and non-financial potential in increasing firm value for long-term company sustainability (Sabatini & Sudana, 2019). Utomo & Machmuddah (2021) said in their research that manager compensation has a positive influence on integrated reporting and firm value. Based on the description above, the third hypothesis of this research is: H3: Manager compensation strengthens the positive relationship between integrated reporting and firm value.

METHOD

The population of this study consists of publicly traded companies listed on the Indonesian Stock Exchange. This research uses a sample of companies listed on the Indonesia Stock Exchange (BEI) in 2022. This research aims to

integrate reporting and annual reports. This research uses secondary data. This research employs a quantitative approach by conducting a content analysis of the quality of integrated reporting services. This research uses quantitative data from integrated reporting and the company's annual report for the year 2022. This research employed the purposive sampling method to select samples based on specific criteria. The criteria used in sampling are:

- (1). During the 2022 period, all public companies were listed on the Indonesia Stock Exchange.
- (2). Companies that maintain and publish integrated reports and annual reports.
- (3). Companies that disclose manager compensation through integrated reporting or annual reports.

Table 1. Variables Measurement

No.	Variable	Indicator	Reference
1.	Integrated Reproting	Content analysis indicator framework IIRC	Abogazia et al. (2022), which refers to IIRC (2013) and Lee & Yeo (2016)
2.	Manager Compensation	Compensation = Total Compensation	Khaled (2020)
3.	Firm Value	Tobin's Q = (Market Value of Equity + Total Liability) / Total Asset	Abogazia et al. (2022)
4.	Firm Size	Firm size = Ln (total asset)	Handayati et al. (2022)

RESULT AND DISCUSSION

Table 2. Descriptive Result

Descriptive Statistics					
	N	Min	Max	Mean	Std. Deviation
IR	486	0,61	0,93	0,7676	0,06532
MC	486	18,60	26,79	22,7769	1,51639
FV	486	14,56	26,11	20,4457	2,30788
FS	486	0,00	9,32	0,5016	0,55023

Source: Data processed in 2023

There are 4 variables tested in this research consisting of integrated reporting, manager compensation, firm value, and firm size. The amount of data used to test each variable is 486. The minimum value for integrated reporting is 0.61, and the maximum value is 0.93. The average value of integrated reporting is 0.7676, and the standard deviation is 0.06532. The standard deviation of integrated reporting is greater than the average value of integrated reporting, so the data distribution is said to be varied or even.

The manager compensation variable test has a minimum value of 18.60 and a maximum value of 26.79. The average value of manager compensation is 22.7769, and the standard deviation is 1.51639. The standard deviation of manager compensation is smaller than the average value of manager compensation, so it is said that the data distribution does not vary or is uneven. The minimum value of firm value is 14.56, and the maximum value is 26.11. The average value of firm value is 20.4457, and the standard deviation is 2.30788. The standard deviation of firm value is smaller than the average value of firm value, so it can be said that the data distribution does not vary or is uneven. The minimum value for firm size is 0.00, and the maximum value is 9.32. The average value of firm size is 0.5016, and the standard deviation is 0.55023. The standard deviation of firm size is greater than the average value of firm size, so it is said that the distribution of firm size data is varied or even.

Table 3. Result of Hypotheses Testing

Variables	β	Sig.	Information
IR	-1,811	0,661	Rejected
MC	-0,139	0,736	Rejected
IR x MC	0,057	0,446	Rejected
FS	0,110	0,000	Influential Positive
Adjusted R-squared		0,098	

Source: Data is processed in 2023

Based on the table above, integrated reporting does not affect firm value, so H1 was rejected. The test results in this study are in line with previous research by Camodeca et al. (2018), Loprevite et al. (2019), and Wahl et al. (2020). In some cases, investors have difficulty assessing the relevance of financial and non-financial information in integrated reporting, so integrated reporting is considered not to have a significant impact on investment assessment (Abhayawansa et al., 2019; Adhariani & de Villiers, 2019). Integrated reporting may not always be a superior report for communicating firm performance to report users, as it typically offers medium- and long-term-oriented information that short-term stakeholders may not require; for this reason, capital markets may not immediately recognise changes in the value relevance of disclosures, but rather in subsequent years (Branco & Rodrigues, 2006). Krueger (2013), Margolis et al. (2009), and Prior et al. (2008) have stated that investors perceive the preparation of integrated reporting reports as an increase in costs due to their inability to enhance long-term value. Albetairi et al. (2018) revealed that there are costs that must be incurred related to disclosing information in integrated reporting, especially disclosure regarding the company's communication strategy. Costs incurred can also be in the form of purchasing environmentally friendly equipment, implementing stricter quality controls, or new health, safety and environmental programs, while costs incurred for the purposes of preparing integrated reporting include data collection and auditing (Branco & Rodrigues, 2006).

Cahan et al. (2016) revealed in their research that there is no agreement about whether investors consider the information in integrated reporting to be relevant and able to help

investors evaluate firm performance. The information disclosed in integrated reporting includes strategy, business model, opportunities and risks of providing an advantage to business competitors, even though the company writes this information to show the company's competitive advantage, thus making the company reluctant to disclose too much information regarding the company's business model, strategy, opportunities and risks (Cosma et al., 2018).

This research finds that manager compensation results do not affect firm value, so H₂ is rejected. Company executives play an important role not only in achieving the company's short- and long-term goals but also in making investment decisions and maintaining company stability (Park & Byun, 2021). In preparing the compensation structure, managers are able to carry out their role in the regulatory scheme regarding compensation policies that impose high costs, which will reduce firm performance (Bebchuk & Fried, 2005).

Park & Byun (2022) research explains that the separation of ownership and company management leads to opportunistic behaviour, where managers expand their interests by reducing shareholder wealth for personal gain. Most public company managers often act opportunistically (Porta et al., 2000). Especially in Indonesia, managers have a high possibility of abusing power (Feresa et al., 2017). The separation of ownership and management also gives managers the opportunity to manage profits to increase manager compensation in the current period, thereby allowing managers to carry out earnings management or manipulate data (Moradi et al., 2015; Rousseau et al., 2023). Compensation can lead to short-term earnings management or excessive risk-taking rather than maximising firm value (Lee & Hwang, 2019). Short-term performance determines manager compensation, which is difficult to link to sustainable firm growth or future performance achievements, thereby reducing overall firm value (Park & Byun, 2021).

In addition, providing compensation causes managers to want to receive more rewards, giving rise to the behaviour of wanting to increase rewards continuously (Fernandes et al., 2018). Managers only focus on rewards that will have a negative impact, so there is a possibility that firm value will decrease due to overinvestment (Park & Byun, 2022; Rose & Shepard, 1997). Overinvestment becomes a value destroyer if it is unable to increase firm value (Barnea & Rubin, 2010). Managers who abuse their power by excessively using company assets, offering high salaries and benefits, and reducing dividend payments are exhibiting overinvestment or excessive investment (Feresa et al., 2017).

This study shows that manager compensation does not strengthen the relationship between integrated reporting and firm value, so H₃ is not supported. Managers, as company administrators, play a crucial role in the company's decision-making regarding the disclosure of company information (Garcia-Sanchez et al., 2020). Managers have information about the company's prospects and can choose whether to provide knowledge voluntarily to investors (Baginski et al., 2018). Managers report and disclose information at the

managers' discretion; usually, managers take advantage of the information they have for personal gain (Ali & Zhang, 2015). According to several studies examining compensation relationships, voluntary information disclosure serves as a potential agency cost, prioritising the personal interests of managers over those of investors (Borghesi et al., 2014; Masulis & Reza, 2015). While it enhances the reputation of individual managers, it does not contribute to value addition (Barnea & Rubin, 2010). Camodeca et al. (2018) found that disclosing information through integrated reporting is only a conversation with little or no impact on investor assessment due to the consequences of manager incentives.

Steyn (2014) researched the implementation of integrated reporting by interviewing senior executive managers of a South African company listed on the Johannesburg Stock Exchange. The results showed that value creation was not the main motive in preparing integrated reporting. Managers are more motivated to fulfil their duties in compiling integrated reporting than to meet investor needs (Jiraporn & Chintrakarn, 2013). Apart from that, implementing integrated reporting causes companies to spend more money or increase costs (Suttipun, 2017). Prior et al. (2008) research reveals that managers often prepare voluntary reporting, including integrated reporting, to shield themselves from criticism. Previous research confirms this: managers often misuse voluntary information disclosure, like integrated reporting, to satisfy their personal needs, enhance their wealth, and increase company spending on report preparation (Hong et al., 2016). The costs incurred can be direct costs or indirect costs. Direct costs arise from the preparation of data, while indirect costs stem from the potential loss of competitiveness due to competitors' access to company information (Lee & Yeo, 2016).

The integrated reporting presented can be less informative due to its long, rambling narrative that primarily focuses on management rhetoric, making it time-consuming to read (Nurkumalasari et al., 2019). The author encountered a variety of reports during her research; most of them presented long narratives, but there were also several reports with narratives that were too short. Integrated reporting that is too long or too short will not be useful for shareholders or investors. Velte (2022) posits that several factors, including company type, size, and business model, influence the length and shortness of integrated reporting. There may be differences in the importance of corporate governance mechanisms in improving each company's performance and sustainability, and there are no integrated governance standards from the government to increase firm value (Arianpoor et al., 2023). The unclear disclosure system in the managerial compensation system presents challenges for enhancing firm value (Park & Byun, 2022).

CONCLUSION AND RECOMMENDATION

This research aims to analyse the influence of integrated reporting and compensation on firm value and determine whether manager compensation is able to moderate the influence of integrated reporting on firm value. This study uses a sample of 486 companies listed on the Indonesia Stock

Exchange (BEI) in 2022, which meets the research sample criteria. Based on the results of data and hypothesis testing in this research, it can be concluded that integrated reporting has no effect on firm value, manager compensation has no effect on firm value, and manager compensation does not strengthen the relationship between integrated reporting and firm value.

The results of this research include two implications, namely theoretical and practical. This research has theoretical implications to add to the literature on integrated reporting. The test results show that the influence of integrated reporting and manager compensation on firm value is not in accordance with the principles of signalling theory. This research has practical implications for corporate management and government. The implication for management is to help company management by considering policies regarding manager compensation in carrying out their obligations. The implication for the government is a consideration for regulating regulations regarding the governance of information preparation and disclosure, such as integrated reporting.

The research, as conducted, has certain limitations. Some of these limitations are only based on a sample of companies listed on the Indonesia Stock Exchange in 2022. We hope that future researchers can incorporate additional variables or substitute proxies for several variables utilised in this research, thereby yielding more diverse results. We anticipate that future research will broaden the scope of the study by exploring various countries, contrasting the application of integrated reporting in developing and developed nations, and extending the duration of the study to multiple periods. In addition, this research only uses one grand theory. We expect future researchers to replace and/or add to the grand theory to obtain results from other theoretical points of view.

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Students Problems in Completing Final Paper (*Skripsi*)

Intan Ghifra Tsani^{a)}, Annisa Rizki Amalia^{b)}, Lintang Vikhasri Putri Hariadi^{c)}, Eko Purwanti^{d)}

English Language Education Department, Universitas Muhammadiyah Yogyakarta, Indonesia, 55183

Email: intan.ghifra.fpb22@mail.umy.ac.id^{a)}; annisa.rizki.fpb22@mail.umy.ac.id^{b)};
vikhasri.putri.fpb22@mail.umy.ac.id^{c)}; ekopurwanti@umy.ac.id^{d)}

ABSTRACT

A final paper or *Skripsi* is one of the mandatory requirements for a bachelor's degree, it means that students have to fulfill their final paper in order to graduate from their study program. This paper aims to determine students' problems in completing their final paper (*Skripsi*). This research used a Qualitative approach with the Case Study as its design and method to gain information. The information of data is gathered through in depth-interviews with four respondents that mostly are currently working on their final papers and an alumnus. The results are divided into two types. From the external factor, the most frequent problem could be found related to the student's supervisor while the internal problems frequently concern the final paper Chapter 1, student's motivation, and time management. Therefore, students were able to solve each of their obstacles by using their own strategies.

Keywords: Final paper (*Skripsi*) writing, student's problem, external factor, and internal factor

ABSTRAK

Tugas akhir atau Skripsi merupakan salah satu syarat wajib untuk menempuh jenjang pendidikan Sarjana bagi mahasiswa, yang mana mahasiswa harus menyelesaikan tugas akhir tersebut supaya dapat lulus dari program studinya. Artikel ini bertujuan untuk mengetahui kendala-kendala yang dihadapi mahasiswa dalam menyelesaikan Skripsi. Penelitian yang dilakukan dalam artikel ini menggunakan pendekatan Kualitatif dengan metode Studi Kasus untuk memperoleh informasi. Informasi data dikumpulkan melalui wawancara mendalam bersama empat responden yang sebagian besar sedang mengerjakan Skripsi dan satu orang alumni. Hasil penelitian dibagi menjadi dua jenis, yakni faktor eksternal dan internal. Dari faktor eksternal, kendala yang paling sering ditemukan ada keterkaitan dengan dosen pembimbing mahasiswa, sedangkan kendala internal yang paling sering ditemukan ada keterkaitan dengan pengerjaan Skripsi di bagian Bab 1, motivasi mahasiswa, dan manajemen waktu. Sebagai tambahan, mahasiswa mampu mengatasi setiap kendala dengan menggunakan strategi yang ditemukan masing-masing.

Keywords: Penulisan Skripsi, kendala mahasiswa, faktor eksternal, dan faktor internal

INTRODUCTION

In completing the final assignment as an undergraduate student, a final paper must be done in the final semester. The paper is mainly about research results and discussions on a topic. A final paper statement is a detailed statement that conveys a well-developed argument or perspective on a certain issue or topic.^[1] According to Webster's New Collegiate, the definition of a final paper has three key elements: a proposition which presents an idea, hypothesis, or recommendation; an argument which advances a rationale for accepting the made proposition, rather than simply asserting a point of view; and a maintained thesis which means it should be made properly with appropriate logic and sufficient evidence.^[5]

Regarding its status as an obligatory part of achieving the bachelor's degree, writing a final paper is a well-known difficult academic task as it involves hard work and effort.^[12] Considering this fact, it would not be difficult for students to face some problems or obstacles during the process of writing the final paper. Safitri et al once stated that the previous study by Evangelista and Hernandez (2013) wrote about students' agreement with the level of difficulty of writing a proposal, implementing research, and producing a research paper.^[12] The problems also vary, as they could arise from students' struggles in writing the paper, students' motivations, time management, and even their own supervisor. Hence, the problems could be separated into two types of factors, external factors and internal factors. External factors are factors that are derived from the environment of an

individual or the influence of other people, while the internal factors are derived from the individual itself.^[6]

Therefore, based on the explanation above, the authors find it necessary to find out the students' problems in writing their final paper (*Skripsi*) by interviewing some respondents. The findings of this research study are related to the common problems in writing a final paper, so that it could be used as an insight for students that are yet to come to the stage of finalization before receiving the bachelor's degree. An implication of this research study is in line with the author's condition in pursuing a degree at university. There are some courses that teach how to write a paper, so, in the future, when writing a research paper, we already have the experience and knowledge to write. Hence, this study used Research Questions as follow: *What are the student's problems in writing a final paper (Skripsi)?*

LITERATURE REVIEW

As an obligatory part of completing the final paper to achieve the bachelor's degree, students have to write the final paper or *Skripsi*. In writing the final paper, there will be guidelines to write the final paper which could be obtained by seeking guidance from the supervisor as the direction and advice provider for the students. *Skripsi* or thesis can be one of the most rewarding, productive experiences of a graduate student's career. It is an opportunity for students to be creative, to bring together and integrate the skills they have acquired, to make a real professional contribution.^[5] *Skripsi* is commonly contained in five chapters: introduction, literature review, methodology, finding and discussion, and conclusion and suggestion.^[2]

Academic writing is formal writing accomplished in an educational setting, such as essays, research proposals, a thesis, dissertations, or articles. In other words, academic writing is a style of written expression with specific intellectual boundaries of expertise.^[3] Writing scientific papers is one of the academic activities that aims to convey the results of research, analysis, or thoughts in a systematic and logical manner to scientific audiences.^[10] In writing a final paper (*Skripsi*) is one fundamental requirement to graduate and it takes about some months in completing the paper with the help of the supervisor.

In some cases, there will be students who feel distress, hardship or problems in writing their final paper (*Skripsi*). The process contains its guidelines and feedback from the supervisor. This final paper provides an opportunity for

students to open their mind variatively and creatively in order to create a significant professional contribution in a student's career.^[5] The problems they may face could come from internal and external factors. *Internal* factors include attitude, mindset, self-talk, and emotions, while *External* factors include other people such as family and friends, social issues, etc..^[7]

Internal problems are that matter within us. It usually influences the individual to be questioning themselves of what they lack in terms of self-esteem, self-doubt, mental health, etc. This problem can occur when we feel something because of an event that causes our thoughts and emotions to be unstable, resulting in either confusion, anger, loneliness, anxiety, etc. According to *Merit Street Media*, internal factors are made up of our own reactions to the events in our life.^[4]

External problems are the opposite of internal problems. If internal is a term that comes from within ourselves, external is a term that comes from our surroundings and affects ourselves. External itself can occur due to many factors such as family, friends, co-workers, profession, and other environmental factors. These factors will lead to us feeling in how we react to the situation, feeling happy, sad, comfortable or uncomfortable, depressed, etc. According to *Libre Text Social Sciences* website, external problems are those that stem from your surroundings, and may include expectations from your family, and friends, cultural or gender stereotypes and family responsibilities.^[9]

Many students are initially anxious about how they will manage to complete such a large and demanding project, generally much larger and more challenging than anything they have previously done professionally.^[5] Thus, Sa'diah wrote in her article that Murray (2006) also stated that the external factor comes from the environment.^[11] It includes the supervisor, other activities such as jobs or careers, and influences from family or friends.

METHODOLOGY

This research study used a qualitative approach with the Case Study as its design and method. This research study collects the information through in depth-interviews with four respondents. Three of them are students that are currently still working on their final papers and the other is an alumnus. The authors chose Ms Lilis, Ms Melati, and Mr Aris as the students and Ms Nia as the alumnus. The details could be seen in the table below.

Table 1. Respondents

No	Name	Status	Institution	Interview Date
1	Lilis	Student	Universitas Tidar	June 13th, 2024
2	Melati	Student	UIN Syarif Hidayatullah Jakarta	June 19th, 2024
3	Aris	Student	Universitas Muhammadiyah Yogyakarta	June 20th, 2024
4	Nia	Alumnus	Universitas Muhammadiyah Yogyakarta	June 20th, 2024

The authors used the formal Indonesian Language when interviewing and recording all the interactions between the authors and the respondents using mobile phones before summarizing the result into a paragraph, using it as the main source of this research paper.

RESULT AND DISCUSSION

This study aims to find out the students' answers to their problems in completing the final paper (*Skripsi*) through the interviews that have been conducted. The answers from the respondents could be read in the paragraphs below.

The first respondent, Ms Lilis was our first source of this study. She is a student at Universitas Tidar and is currently in the finalization stage process in completing the final paper (*Skripsi*). According to Ms Lilis' answers, she had difficulties in completing the final paper. The difficulty she had was when adjusting the research background, research question, theory, and the right research method, or what we called as the first chapter (*Bab 1*). Completing this chapter takes around three months. She also shared that there are problems obtained from her supervisor who are difficult to contact and also supervisors who can only be met once in a week. The next problem was found in herself. These inner problems are lack of motivation and overthinking which leads to postponing the work. One of the factors is that writing a final paper does not have any specific deadline, which allures her to postpone the work even more.

The second source is Ms Melati. She is in the process of finalizing the final paper (*Skripsi*) too. She is a student at Universitas Islam Negeri Syarif Hidayatullah Jakarta. She also found the difficulties in completing the final paper. Ms Melati also had difficulty in preparing the first chapter, that is, summarizing the formulation of the problem to be researched. In completing this chapter, she needs around three months to finish it. Besides that, an external problem encountered was that some people asked sensitive and private questions to the interviewee, which was quite

disturbing and violated her privacy. This problem affected her motivation to continue her final paper writing process by decreasing it a little. Another problem that she faced was time management where she had trouble maintaining her time to allocate her daily activities resulting in delaying her work. Besides, she also has a job which narrows down her time to do her final paper.

The next source is Mr Aris. He is a final-semester student at Universitas Muhammadiyah Yogyakarta. Now, he is also in the process of working on his final paper. Different from the previous respondents, he found difficulties in preparing Chapter 2, precisely in the literature review section because there were many articles to read and to collect relevant theories. He needs a month to complete this specific chapter. Another problem encountered is time constraints with the supervisor who has lots of other schedules. Therefore, Mr. Aris had to adjust the schedules with his supervisor. Another difficulty is time management, because he already has a job outside the final paper (*Skripsi*) completion activity. Therefore, there is very little time to work on his final paper.

The last source is Ms Nia. Unlike the previous respondents, she has already graduated from Universitas Muhammadiyah Yogyakarta. Back when she was in the process of completing her final paper (*Skripsi*), she had problems in the first chapter (*Bab 1*), precisely in determining the research topics, methods, and research questions. According to Ms Nia, deciding on research methods is the most challenging thing. She needs to read lots of articles and journals to make her references. It took three months for her to finally complete the first chapter. Her next struggle is that she had difficulties in communicating with the supervisor because of the Covid-19 pandemic and also the supervisor's other busy schedule because at that time, the supervisor was on the way to receiving a higher promotion.

According to all the respondents' answers, it could be concluded that students' problems in the process of

completing the final paper (*Skripsi*) are varied. It could be seen in the table below.

Table 2. Student's Most General Problems in Completing Final Paper (*Skripsi*)

	Lilis	Melati	Aris	Nia	General Problems
External	- Communication with the supervisor	- Too many probing questions from the environment - Job	- Supervisor's busy schedules - Job	- Communication with the supervisor	- Communication with the supervisor - Job
Internal	- Adjusting Chapter 1 - Lack of motivation - Anxiety and overthinking	- Formulating Chapter 1 - Lack of motivation caused by time management - Time management caused by job	- Writing Literature Review on Chapter 2 - Time management caused by job	- Determining Chapter 1 - Motivation for reading lots of journals	- Writing the Chapter 1 - Lack of motivation - Time management

According to the respondents' answers, the external problems are determined from the respondents' environment, their supervisors, and other demanding jobs outside their university activities. Starting from problems arising from the environment are found in one of the respondents who received lots of pestering questions that were quite troubling. As Ms Melati said, the internal problem comes from the environment, particularly family and friends. The most problems that were experienced by all of the respondents was with their supervisor, whether it was about the supervisor's tight schedules or about their communications. Ms Lillis said that the supervisor is the one of the external problems she faced in writing the final paper. This problem is mainly caused by problems in contacting the supervisor and meeting schedule for revision, in which she was only given the chance once a week. Mr Aris also has a problem with his supervisor because of the supervisors' busy schedule. Aside from that, Ms Nia's problems with her supervisor are caused by the Covid-19 pandemic which makes it difficult to communicate with her supervisor, especially because their main locations are quite far away. This kind of problem is as stated by Apriyani that lots of students when writing a final paper are faced with the obstacle from the supervisor, mostly about the schedules because consulting with the supervisor is really important.^[2] Thus, the last problem concerning other demanding jobs outside the paper-writing was found in one of the respondents, where he has to balance the two important activities. Farizal said that Tatan (2015) once stated jobs or careers could delay students in writing their final papers.^[6] The respondent, Mr Aris said that having a job also hampers the final paper

and makes the final paper less time consuming and he had to adjust between work obligations and writing the final paper.

As for the internal problems, according to the respondents' answers, the biggest problem was determined from the final paper itself. Most of the respondents are challenged when they are processing the first chapter where they have to determine the contents in it. As stated by Harjum, the internal problems concerning how students look and search for material or final paper titles and read a lot of literature books.^[8] Ms Lilis, Ms Melati and Ms Nia, they had the same problem. According to their answers, they said that they had difficulty in writing Chapter 1 and it took a long time to complete. Most of them are facing difficulties in determining the research method, research background, topic, and research question. Different from the others, Mr Aris on the other hand has a different answer. As he said, he had difficulty in writing Chapter 2 instead, specifically in writing and determining the Literature Review. Furthermore, the second problems faced by respondents are mostly equal between motivation and time management. According to Harjum, J.J. Siang (2009) once stated that one of the obstacles that arise in writing a final paper consists of an internal factor, especially the lack of interest or motivation.^[8] Ms Lilis once said that she lacks of motivation and experiences lots of overthinking quite often, which leads to procrastination which she stated as one of the problematic factors. When students have good opportunities and environments, their motivation would surely increase, especially by maintaining good communication with their supervisors.

At the same time, they have to balance their final paper with the other activities outside their study obligations. This obstacle was interconnected with the jobs or career issues in the external factors explained by Tatan (2015).^[6] Additionally, according to the respondents' answers, time management must adjust between working on the final paper and daily activities. Mr Aris said that because of having a job, do not let the time to complete the final paper be neglected. This statement was corresponding with Farizal's findings in his research paper.^[6]

Lastly, from the problems faced by the respondents, they tried to overcome those problems that they faced. As Ms Lilis did, she tried to force herself to do what she was obligated to do, which was the final paper. Then Ms Melati tries to maximize the time available and overcome the laziness that exists within herself. Mr Aris, who manages the time between work and his final paper, tried to continue writing while balancing his work and obligations as a student. As for Ms Nia, she said that mostly, what she did was intense praying, even reciting lots of prayers for her own supervisor with surah Al-Fatihah and surah Al-Mu'awwidzat (Al-Ikhlas, Al-Falaq, and An-Nas) from the Holy Qur'an. Besides, she was also always reading lots of research articles and journals for references. As Sa'diah et al stated, students mostly overcome their problems by reading many books, journals, and articles related to their research topic.^[11] Therefore, students could solve the obstacles by using their own strategies.


CONCLUSION AND RECOMMENDATIONS

In completing the final assignment as an undergraduate student, a final paper must be done in the final semester. According to the results of our research, although working on a final paper or *Skripsi* is easy with the guidance of a supervisor, there are also challenges and problems or unexpected things in working on it. It can be seen from the results of our interviews with the respondents that the results are divided into two types. From the external factor, the most frequent problem could be found related to the student's supervisor while the internal problems frequently concern the final paper Chapter 1, student's motivation, and time management. Therefore, students were able to solve each of their obstacles by using their own strategies.

Based on the result of this research study, the authors suggest that the respondents and all of the students who are both in preparation and in the middle of completing their final papers (*Skripsi*) to intensify their confidence and motivations and also to improve their time management to minimize the possible problems. Students could also strengthen and preserve healthy

communication with their families, friends, or supervisors to achieve better results. As for future studies, the authors suggest further research in this topic and enlarging its range of respondents in order to gain more variables and information, especially the one which has not been investigated and explained in previous research.

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The Effectiveness of Presidential Democratic System Government in Multiparty Systems

Annisabella Oktaviani ^{a)}, and Nanik Prasetyoningsih ^{b)}

Faculty of Law, University Muhammadiyah Yogyakarta, Yogyakarta, Indonesia, 55183

Email: oktaviani.law21@mail.umy.ac.id^{a)}; nanikprasetyoningsih@mail.umy.ac.id^{a b)}

ABSTRACT

Applying a presidential democratic system to a multiparty system has become a fascinating and controversial topic in recent years. Several countries, including Indonesia, have implemented a presidential system accompanied by a multiparty system to improve the quality of democracy and government stability. This research examines the effectiveness of implementing a presidential democratic system in a multiparty system, focusing on government stability and implications for effectiveness. Using normative juridical legal research methods shows that implementing a multiparty system in a presidential government system weakens the presidential system and has implications for executive and legislative relations. Three things have repercussions: first, the many interests of political parties that conflict with government policy; second, the absence of a permanent coalition arrangement; and third, the weakness of the President's position. Ideally, implementing a multiparty system, stability, and effectiveness of government requires extra balance, firm government, and authority in developing the government system. It can be concluded that implementing a presidential democratic system in a multiparty system has several significant implications for the stability and effectiveness of government.

Keywords: effectiveness; multiparty system; presidential system

ABSTRAK

Penerapan sistem demokrasi presidensial pada sistem multi partai telah menjadi topik yang sangat menarik dan kontroversial dalam beberapa tahun terakhir. Sistem presidensial yang diiringi dengan sistem multipartai telah dilakukan oleh beberapa negara, termasuk Indonesia, dalam upaya meningkatkan kualitas demokrasi dan stabilitas pemerintahan. Penelitian ini menelisik efektivitas penerapan sistem demokrasi presidensial pada sistem multi partai, dengan fokus pada implikasinya terhadap stabilitas dan efektivitas pemerintahan. Dengan menggunakan metode penelitian hukum yuridis normatif menunjukkan bahwa penerapan sistem multi partai dalam sistem pemerintahan presidensial justru memperlemah sistem presidensial dan memiliki implikasi terhadap relasi eksekutif dan legislatif. Tiga hal yang menjadi implikasinya adalah: pertama, banyaknya kepentingan partai politik yang bertentangan dengan kebijakan pemerintah; kedua, tidak adanya pengaturan koalisi tetap; dan ketiga, lemahnya posisi Presiden. Idealnya penerapan sistem multi partai, agar terciptanya stabilitas dan efektivitas pemerintahan, diperlukan keseimbangan ekstra, pemerintahan yang tegas, serta berwibawa dalam mengembangkan sistem pemerintahan. Dapat disimpulkan bahwa penerapan sistem demokrasi presidensial pada sistem multi partai memiliki beberapa implikasi yang signifikan terhadap stabilitas dan efektivitas pemerintahan.

Kata Kunci: Efektivitas, Sistem Multi Partai, Sistem Presidensial

INTRODUCTION

In the global political panorama, system presidential and multiparty parties have become characteristics important in many countries. Both hold vital roles in form dynamics politics, stability governance, and representation politics for citizens. System presidential, with a focus on leadership and a strong executive, is different from system parliamentarians who put the executive power in the hands of parliament [1]. On the other hand, a multiparty system gives spacious space for plurality politics and offers

diverse, reflected views and interests in various party politics. Currently, Indonesia uses a presidential system where the President serves as both head of state and head of government, which means he holds the most incredible power in this country. In Indonesia's presidential system of government, the President, as the holder of executive power, is balanced with the People's Representative Council (DPR), the legislature that the people elect through elections [2].

Historically, Indonesia's government has often experienced a combination of the systems of

government and parties. The multiparty system in Indonesia is motivated by its high level of pluralism society and very complex plurality. Apart from that, history and socio-cultural factors are one multiparty formation system in Indonesia [3]. System The presidency in Indonesia was first implemented in 1999, after political reforms that occurred in 1998; at the time, the President of Indonesia, BJ Habibie, proposed a system presidential as an alternative to the system the previous parliament used. System This is applied to increase stability in governance and improve the President's ability to operate his tasks. An application multiparty system also accompanied an application multiparty system accompanied application system The presidency in Indonesia parties to participate in governance and influence policy government [4]. In the system, the party's different politics own different and usual interests and goals compete in the election to obtain a seat in parliament. Multiparty system This possible party is political for coalition and government formation, but it can also hinder the government's stability if a committee is formed. It is not stable.

The presidential system and multiparty system are two concepts related to government, especially in the Indonesian context. The presidential system refers to a system of government in which executive power is held by a President who the people directly elect. Meanwhile, a multiparty system refers to a party system in which several political parties participate in the political and government process [5]. In the Indonesian context, the presidential and multiparty systems have been combined in government. This can be seen in Article 6A paragraph (2) of the 1945 Constitution, which states that the President and Vice President are proposed by political parties or combinations of political parties. Thus, political parties play an essential role in the governance process, especially in the nomination of President and vice president.

Implementing a democratic and multi-party presidential system has become a very relevant topic in modern government. The presidential democratic system, implemented in Indonesia, requires direct general elections to elect the President and Vice President [6]. Meanwhile, a multi-party system allows various political parties to participate in the democratic process. However, combining these two systems has given rise to multiple conflicts and implications that affect government effectiveness [7]. A presidential democratic system ensures that executive power is not accountable to the people's representative body. Executive power is outside the direct supervision of parliament, so the President has

the freedom to make decisions. However, many different political parties can disrupt government stability in a multi-party system. Other political parties can have different interests and can disrupt stable coalitions.

Presidential government combined with a multiparty system in Indonesia has been the subject of lengthy debate. These two systems have significant advantages and disadvantages, and how they interact can affect government effectiveness [8]. In the Indonesian context, the multiparty system has given rise to various conflicts. The difficulty of controlling the democratic process, unhealthy coalitions in the cabinet and parliament, and ongoing disputes between the presidential and representative institutions have become the hallmarks of presidential government in Indonesia [9]. The ideal party system implemented in Indonesia is a simple multiparty system to maintain government stability. Too many political parties are one of the factors contributing to the ineffectiveness of the government system in Indonesia.

A combined presidential government with a system in Indonesia has long been debated. The second system Has significant advantages and disadvantages, and how they interact can influence the effectiveness of the government. In synthesis, the effectiveness of implementing a presidential democratic system and a multiparty system depends on how political parties can work together in the democratic process [10]. A conditioned multiparty system can strengthen the President's position and ensure government stability. However, if not conditioned, a multiparty system can disrupt government stability and hamper the democratic process. Therefore, there is a need to improve and develop a more effective party system to ensure the sustainability of presidential democracy in Indonesia.

Amid these complex dynamics, the question of the effectiveness of presidential systems in multiparty systems becomes increasingly relevant. How can a presidential system function effectively where political power is divided among several parties? Can cooperation between the executive and legislature be maintained well in a system allowing this political diversity? In this article, we will examine the effectiveness of a presidential democratic system of government in a multiparty system in Indonesia. In the middle dynamics complex, this question about the efficacy of system presidency in a multiparty system becomes more relevant. How can the presidential system work effectively in a context where political power is divided between several parties? Can cooperation between executive and legislative be good

in a possible system for diversity in politics like this? The article, it is we will examine the effectiveness of the government system democracy in the multiparty system in Indonesia.

LITERATURE REVIEW

For years, research on government effectiveness in presidential democratic systems in multiparty systems has continued to develop, deepening our understanding of complex political dynamics. In their latest study[11], investigate the relationship between presidential democratic systems and democratic performance in multiparty systems. They explore how the structure of executive power in presidential systems can influence political stability and government effectiveness. This study provides an in-depth understanding of the factors influencing government effectiveness in multiparty presidential democratic systems. A presidential democratic system is a form of government in which power is divided between the executive and legislative branches, with the president as head of state and the head of government elected separately from the legislature. This is a model often adopted in Latin America and the United States. Meanwhile, a multiparty system is a political system where more than two political parties compete in general elections and have a significant role in government. This model is familiar to many European countries and is also found in other democratic countries worldwide.

Based on this research, it is essential to highlight executive power in determining democratic performance. They find that solid executive powers in presidential systems can influence political stability by providing leadership continuity and firmness. This shows that presidential democratic systems tend to have more excellent political stability than parliamentary systems in multiparty systems. A president with a fixed term of office and solid executive authority can reduce political uncertainty and avoid deadlock in decision-making. The effectiveness of government in a multiparty system can vary depending on the president's ability to build coalitions and maintain good relations with the legislature. Forming a solid alliance and political consensus is the key to achieving success in policy formation. Increasing political stability and government effectiveness can be achieved by strengthening democratic institutions, strengthening cooperation between branches of government, and encouraging inclusive political dialogue.

METHOD

This research uses normative legal research methods, namely library law research because library materials are the main focus. This research focuses on the analysis and study of positive law using three approaches: the statutory approach, conceptual approach, and historical approach.

RESULT AND DISCUSSION

System Presidential

The system presidential is a form of government in which the executive (President) is separated from the legislative and elected in a way. System This is based on the United States model of government and is popularized in many countries worldwide. The principle behind the presidential system is the separation of power between branches of government, that is, executive, legislative, and judicial. The presidential system is a system of government where the President or The Chairman of State holds executive power and is a symbol of state power [12]. The President is usually chosen directly by the people and holds power for a specified time. In the presidential system, the President has the power To make decisions and determine policy without following an agreement from parliament.

The presidential system separates power between the President and legislative institutions. The President's authority is broad executive, including appointing ministers and taking administrative decisions. System presidents own a rich and complex history involving evolution politics, thought philosophy politics, and experimentation governments in various countries [13]. Draft separation power between the executive, legislative, and judicial has Existed since ancient times, especially in the works of philosophers like Plato and Aristotle. They discuss ideas about the importance of restrictions on the government to prevent abuse of power. Principles of separation of power can be found in the political system Roman Empire, where there is a distribution of power between the emperor (executive), the senate (legislative), and the court (judicial) [14].

Draft system Modern presidents are influenced by the thoughts of thinkers such as Montesquieu, who emphasized the importance of separation of power in preventing abuse of power by the government. "The Spirit of the Laws" (1748), became the base for modern government formation, including the presidential system. The presidential system was first implemented after the American Revolution when the United States government was formed [15]. The

United States Constitution, drafted in 1787, established a structure of government with power divided between the executive (President), legislative (Congress), and judicial (Supreme Court) [10].

United States Constitution become a model for other countries who want to apply a system. Many countries in Latin America and around the world have adopted this model after obtaining independence from colonialism. During the 19th and 20th centuries, many Latin American, African, and Asia countries adopted its presidential system as part of the experimental government [15]. However, not all experienced this walk smoothly, and several countries experienced instability, politics, and conflict because of problems in the presidential system. Draft main in the system is the separation of power between the executive, legislative, and judicial. Every branch needs to be more. Different responsibilities and authorities are expected to prevent the abuse of power.

The President in a system of presidential authority is an independent executive. They are chosen in a way that separates them from the legislative body, and they have the authority to make decisions independently without being mixed hands with the legislative body [16]. Presidents own significant power in making decisions, like lifting ministers, executing policy, and leading the strength arm. They also have veto power against a law approved by a legislative body [17]. Accountability in the system tends to be more straightforward because the President is responsible for giving answers to the people through the general election.

However, independent power is also a possible cause of a lack of accountability. If not, there is an effective mechanism for supervising the President. The President tends to give stability to politics Because the President has tenure and does not depend on the support of the majority in the legislature. The presidential system still became one of the most common government models used worldwide, especially in adopting countries' traditions of constitutionalism and democratic representation. Despite its challenges and weaknesses, the system This Keep develops and adapts to the dynamics of modern politics.

Multiparty System

A multiparty system is a political model in which more of the parties' political support is significant from voters and can compete in the general elections [18]. The history and concept of a multiparty system involve the development of ideology politics, the evolution of system politics in various countries, and

changes in social and political influences of party politics. There has been a draft party political system since ancient times [19]. Still, modern multiparty systems began appearing in the 18th and 19th centuries in countries such as the United Kingdom and the United States. In context, this is the party's political start, which was formed to represent diverse political views in the retrieval process decision [20].

The era of Revolution and reform in Europe, such as the Revolution in France at the end of the 18th century, sped up the development of the party system with the appearance of parties and modern politics representing various ideologies, starting from conservative to liberal and socialist [21]. In the 19th and 20th centuries, many countries in Europe and America experienced significant politics going to democratic representatives this opened the road for growth parties, more political pluralism, and the emergence of multiparty systems in various countries [22]. In the era of globalization, this multiparty system has become characteristic of Many systems of politics worldwide, including in developing countries [23]. The growth of the internet and social media has also played a role in expanding room politics and providing a platform for political parties to grow.

A party System is a system of parties where they exist more than two parties participate in politics in government. In this system, the parties with different politics have different and usual interests and goals and compete in the election to obtain a seat in parliament [14]. A combination of a presidential and a party system is a system of unified government power with a strong executive and a pluralist party. In the system here, the President is chosen in a way directly by the people and holds power For a specified time [24]. Meanwhile, parties in different politics have competing interests and goals in general for obtaining a seat in parliament.

Draft central in multiparty systems is pluralism politics, diverse party competitive politics in the political arena for obtain support from the voter. A multiparty system is based on competition and healthy politics between various parties [25]. These parties compete to get support from voters who offer different programs and policies. One of the central multiparty systems is more diversity in representation from various viewpoints in the retrieval process decision [26]. This matter makes it possible for voters to choose the most suitable party with values and interests. Apart from that, because a party seldom wins a political majority in the general election, the government is often formed through a coalition between several party politics [27]. This emphasizes the importance of

negotiation and compromises in the formation process of government.

With diverse party politics, a multiparty system creates more exchange of ideas and political discussions. This matter can produce more policies that mature and enrich the democratic process. The multiparty system is often considered an indicator of a healthy democracy in a country [28]. With healthy competition between political parties, democracy can be more stable and represent good. Although the party system's own excess supports more representation, variety, and competition in healthy politics, it also has challenges, such as potency for fragmentation politics, the formation of fragile coalitions, and difficulties in making decisions [29]. However, in proper context and with effective mechanisms for managing challenges, the multiparty system can be a robust model for building inclusive and dynamic democracy.

The Effectiveness of Presidential Democratic System Government in Multiparty Systems

System presidential and multiparty systems are two political models that have influenced governments' stability, representation, and effectiveness in various countries worldwide. In context effectiveness, the second system Has different advantages and challenges, which can affect performance governance and stability politics [30]. Therefore , it is essential to understand how the system interacts with the party system and its impact on the effectiveness of government [31]. In a system, there are several party political can parties, impossibly the legislative, and temporary Presidents originate from party different politics [32]. This matter can cause conflict between executive and legislative and balance the power desired by the presidential system.

First, a system that combines the presidency with a system can produce a government that is less than ideal and practical. In a multiparty system, political parties have significant power in the legislative process and can interfere with the policies taken by the President. This could result in the President having to accommodate the interests of political parties in assembling the cabinet, which could lead to a fragile coalition [33]. This fragile coalition can be caused by political parties that do not have ideological closeness and changing composition, so the President can have difficulty operating an effective policy. Alone's weakness is in supervising power executives who can create absolute power [34]. Power executives who aren't supervised directly by the legislature can President For make decisions without considering the other side so that they can produce no clear or compelling decision.

Additionally, multiparty systems can add complexity to decision-making. In a system, the parties have different interests and views so that it can produce no decision precise and complex Implementation. This matter can bother the stability of the government and hinder the ability government to make effective decisions [35]. Then, a system combining the presidency with a system can make the government more prone to influence party politics. In a system, a party's political strength influences decisions in government, so it can produce no clear or ineffective decision if conservative-dominant politics have different interests from the people's [36].

Second, a presidential system combined with a multiparty system can disrupt government stability. In a multiparty system, the governing and electoral coalitions often differ, making it difficult for the President to gain majority support from the DPR [37]. This majority support is critical to implementing effective policy, and when it is absent, the President can have difficulty executing the desired policy [33]. Then, in the deep system, parties own different interests, which can result in conflict and differences under challenging opinions. In the presidential, the President has the power of the broad executive; however, in a multiparty situation, the President must maintain support from parliament to carry out policy [38]. Suppose the party president has no majority in parliament. In that case, the President must depend on the coalition of other parties to get support, which can make the government insufficient.

On the other hand, a system can produce a situation in which the parties' own different interests or cannot reach an agreement. In a presidential system, the President can lead different parties and coalitions, which can become very difficult [32]. If the party president does not own a majority in parliament, then the President must maintain support from the party [39]. Effectiveness System the President is determined by two dimensions: effectiveness system (institutional) and effectiveness personality President (non-institutional). A president's compelling personality can influence the government's stability because an effective President can lead parties and coalitions with more OK to maintain the strength of the government.

Third, a presidential system combined with a multiparty system can disrupt institutional independence. In multiparty systems, political parties have significant power in the legislative process, which can interfere with the autonomy of other institutions [24]. This can cause other institutions, such as the judiciary, to be unable to carry out their

functions effectively, disrupting government stability. When power is divided between Lots of party politics, there is a risk that parties will use positions to obstruct or block policies proposed by the government. This matter can hinder the ability of the government to act effectively and influence independent business institutions to operate tasks.

CONCLUSION AND RECOMMENDATION

A system government, combined with a presidency, can produce a less than ideal-and adequate government because of weakness in the supervision of the powerful executive, complexity in making decisions, and vulnerability to influence party politics. A multiparty system can weaken the presidential system, cause tension between the president and the legislature, and lead to conflict between the president and representative institutions. Therefore, extra balance and a firm and authoritative government are needed to develop the government system. To increase the effectiveness of government, a system government must be designed with possible ways to supervise power effectively, the executive, the retrieval of clear and effective decisions, and intense supervision to influence party politics. In synthesis, the effectiveness of the government system, democracy, and the multiparty system in Indonesia can influenced by several factors. Factors This includes fragile coalition, stable governance, and institutional independence. To increase government effectiveness, changing the multiparty system is necessary. Change This can cover simplifying party politics, regulating coalition fixed, and setting institutionalization opposition. Thus, the government can become more stable and effective and more capable of operating policies that the people want. Considering actors, the system's effectiveness in the context of the party system can vary depending on each country's historical and cultural conditions. Necessary To identify the strengths and weaknesses of each system as well as strengthen promoting mechanisms of stability, accountability, and representation of practical politics.

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The use of artificial intelligence in numerical learning of geometry for students with mild intellectual disabilities

Dini Wulandari ^{a)}, Istadi Istadi ^{b)}, and Anwar Muttaqien ^{c)}

Department of Mathematics Education, Faculty of Teacher and Education

Universitas Muhammadiyah Sampit, Central Borneo, Indonesia

Email: wuldardini@gmail.com ^{a)}; addysahabatmu@gmail.com ^{b)}

ABSTRACT

Education is very important nowadays. Education plays an important role in improving human resources. Children are asked to be able to understand various sciences well, one of which is geometry in mathematics lessons. However, there are still many children who have difficulty getting a decent education, especially children with intellectual disabilities. This article aims to review effective learning methods for students with intellectual disabilities in understanding geometric material and being able to apply it in solving problems in real life contexts. One branch of mathematics that needs to be studied in depth is geometry. Since childhood, we have started to recognize objects that actually use geometric shapes. These objects are even simple objects that we often encounter around us. Apart from knowing the shapes and formulas in geometry, we are also expected to be able to apply geometry in everyday life. Students with intellectual disabilities are expected to have numerical abilities in solving geometry problems. This research uses a qualitative descriptive method by describing and analyzing data related to the discussion. Students with intellectual disabilities need learning media that can be more interactive and can increase understanding and creativity in thinking. By using artificial intelligence teachers can develop more effective learning media for students.

Keywords: Artificial intelligence, Geometry, Intellectual disabilities

ABSTRAK

Pendidikan merupakan hal yang sangat penting saat ini. Pendidikan memegang peranan penting dalam meningkatkan sumber daya manusia. Anak-anak dituntut untuk dapat memahami berbagai ilmu pengetahuan dengan baik, salah satunya adalah geometri dalam pelajaran matematika. Namun, masih banyak anak yang kesulitan untuk mendapatkan pendidikan yang layak, terutama anak tunagrahita. Artikel ini bertujuan untuk mengulas metode pembelajaran yang efektif bagi siswa tunagrahita dalam memahami materi geometri dan mampu mengaplikasikannya dalam menyelesaikan masalah dalam konteks kehidupan nyata. Salah satu cabang matematika yang perlu dipelajari secara mendalam adalah geometri. Sejak kecil, kita sudah mulai mengenal benda-benda yang sebenarnya menggunakan bentuk-bentuk geometri. Benda-benda tersebut bahkan merupakan benda-benda sederhana yang sering kita jumpai di sekitar kita. Selain mengenal bentuk-bentuk dan rumus-rumus dalam geometri, kita juga diharapkan dapat mengaplikasikan geometri dalam kehidupan sehari-hari. Siswa tunagrahita diharapkan memiliki kemampuan numerik dalam menyelesaikan masalah geometri. Penelitian ini menggunakan metode deskriptif kualitatif dengan mendeskripsikan dan menganalisis data-data yang berkaitan dengan pembahasan. Siswa tunagrahita membutuhkan media pembelajaran yang dapat lebih interaktif dan dapat meningkatkan pemahaman serta kreativitas dalam berpikir. Dengan menggunakan kecerdasan buatan guru dapat mengembangkan media pembelajaran yang lebih efektif bagi siswa.

Kata kunci: Kecerdasan Buatan, Geometri, Disabilitas Intelektual

INTRODUCTION

Mathematics is a very important subject in the development of a child's thinking ability. Actually, mathematics is not only about numbers, but many other things are more in-depth. Mathematics is not only used in the development of knowledge, but also in developing creativity, skills, ethics, morals, and morals. In everyday life, we are often faced with problems that require mathematics to solve. In mathematics learning, it would be good for students to be guided to improve their numerical skills. Numeris itself is the ability to use and manage data to be able to solve problems. Geometry is one of the core branches of mathematics, which is given to

students from elementary school to high school. The size, location, and shape of an object are studied in this geometry subject.[1] [2][3][4].

For children with special needs, a good understanding of mathematics is needed to hone their intelligence. However, there are still many children who consider mathematics to be a difficult subject. Especially for children with special needs who usually have intelligence below that of normal children. What is called learning difficulties is when students are not able to learn as they should. Therefore, special handling is needed for students with special needs in the learning process, especially in mathematics learning. The need for efforts in the

application of mathematics learning strategies for children with special needs, especially in achieving an understanding of shapes and formulas for solving problems in geometry [5] [6].

Children with intellectual disabilities are children who have abnormalities due to deviations, both in terms of physical, mental, intellectual, emotional, attitude and social behavior significantly. This is due to damage in the central nervous system which causes the nervous system to malfunction so that the working process does not run properly. Children with mild intellectual disabilities can only understand skill learning and academic levels up to the elementary school level. Children with mild intellectual disabilities have difficulties in storing and organizing words, so there are difficulties in abstract thinking. They can take part in education in elementary school (SD) or in special school's part C [7].

In the current era of globalization, technological development is increasingly rapid, so it is inevitable that it will have an impact on the world of education. As educators, teachers are required to be able to understand the need for technology today. Technology is very important to help improve the quality of learning, as well as help in the school administration process. Technology is needed in the learning process so that learning can run more efficiently, effectively, and fun. Learning in the classroom should emphasize learning strategies that are more centered on student activity than conventional approaches with teacher-centered activity. One of the technologies that has begun to be developed as a learning medium today is to use [8][9][10] artificial intelligence. Artificial intelligence is a machine model that is programmed to have intelligence like a human [11].

RESEARCH METHODS

The method used in this research is the literature study research method. This research was conducted by collecting literature from various journals, articles and interviews in several schools. This research was carried out by collecting data from various sources related to the use of artificial intelligence in learning geometric mathematics and geometric numerical learning strategies using artificial intelligence for children with intellectual disabilities. The use of this method is to obtain a theoretical basis regarding the problem being discussed.

Data collection was carried out by collecting relevant literature as a primary data source which was sourced from various databases such as sinta.kemdikbud.go.id, *Google Scholar*, *garuda* portal, and conducting interviews in several schools. The data collected was analyzed using a descriptive method, which is to describe the aspects that are the focus of the research. The purpose of using the literature study method in this study is as a first step in planning research by utilizing literature sources and interviews.

DISCUSSION

In a study conducted by Jannah et al., (2021) it was explained that the increase in learning outcomes was one of the reasons for student learning motivation. Based on research conducted by Purnama (2024), student motivation in learning and learning outcomes can increase with the influence on the implementation of artificial intelligence. This can have an effect due to the use of [12] artificial intelligence which can increase students' interest in learning. Increased motivation is shown by the willingness to participate in greater learning. In a study conducted by Alomari and Jabr (2020), the results were obtained, namely in the experimental group, the group that used learning strategies with [13] [14] artificial intelligence cognitively superior compared to the control group. In addition, it also increases the learning outcomes and achievements of students who use learning strategies with artificial intelligence [15].

In an interview I conducted at SMP N 3 Sampit, the use of artificial intelligence technology in learning geometry mathematics has advantages and disadvantages. The use of *artificial intelligence* in learning can not only help teachers in delivering material. Students can also develop their creativity in making percentage materials or as a medium for doing other tasks. However, the use of artificial intelligence in learning that asks students to use mobile phones or laptops sometimes makes some students who are lazy to learn open up other things that are not included in the interest of learning on their mobile phones or laptops.

One of the learning characteristics of students with intellectual disabilities is difficulty in abstract thinking and understanding complex concepts. Therefore, they tend to learn more easily through concrete experiences and need learning media that can help them understand the material better. The visually impaired have the ability to understand and slow thinking skills, so they need specific, factual, and very attractive learning media because they quickly feel bored and easily distracted. One of them is by using interactive multimedia. Learning that uses interactive multimedia contains visual and audio elements that can help train children's thinking skills and memory. Especially for children with mild disabilities, the use of interactive multimedia is the right choice because the material presented is concrete and unconventional [16][17][18].

Use of applications based on artificial intelligence It is also very helpful in making learning applications for children with intellectual disabilities. The use of multimedia learning media in the form of videos and quizzes designed using Artificial Intelligence Platforms and Applications like *Thunkable* make the learning process more interactive, so that it will make the learning process more effective and soothing. In addition, the use of artificial intelligence in the form of videos or images, it can visualize an object so that it can improve students' numerical skills, especially in solving a geometry problem. The students will not be bored easily so that the interest in learning in students can increase. In developing learning media using *Thunkable* It requires

several stages of research and development, namely: Define (definition), Design (planning), Develop (development) and Dessiminate (spread) [19].

However, in some areas artificial intelligence has not been used as a supporting learning medium for students with intellectual disabilities. This can be seen from the results of my interview at SLBN 1 Sampit, there has been no application of learning media that uses artificial intelligence both in mathematics and other subjects. In learning geometry mathematics, they still use conventional media. They use concrete objects to depict flat shapes and geometric space shapes.

Judging from research conducted by Brigitta D. A. Arjanti et al., it appears that artificial intelligence can visualize an object for students with intellectual disabilities, namely plant parts [20]. So, with this geometry lesson, teachers can visualize geometric objects with artificial intelligence. One strategy for using artificial intelligence related to numerical learning in solving geometric problems is to teach students to compare geometric shapes with objects in the real world and to also find out the height of a geometric object by describing the object using artificial intelligence technology such as Canva and Geogebra. Children can also be asked to watch videos and then give quizzes that can hone students' geometric numerical skills

From the results of my interview with a teacher at SMP N 3 Sampit, a learning media related to artificial intelligence the most used is Canva. However, from the results of research conducted by Brigitta D.A.Artanti et al., the use of learning media in the form of videos and quizzes helps children with disabilities become more interactive [20]. One way to create learning media with videos and quizzes is to use an application Thunkable. The method of making learning media using Thunkable are as follows.

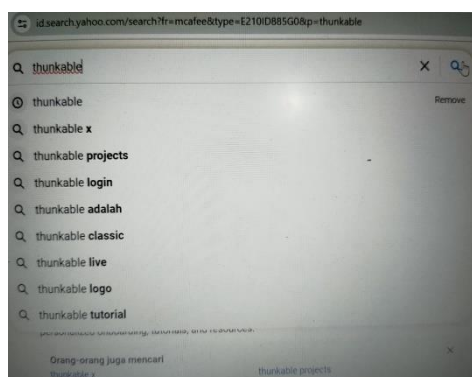


Figure 1. Go to Thunkable Website

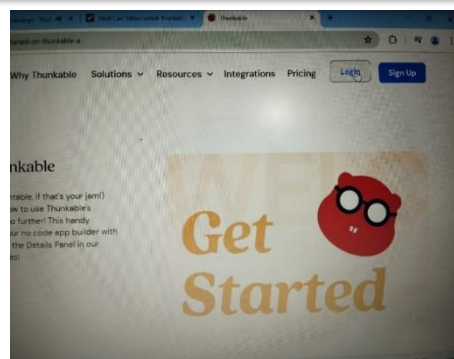


Figure 2. Once opened, press the login button

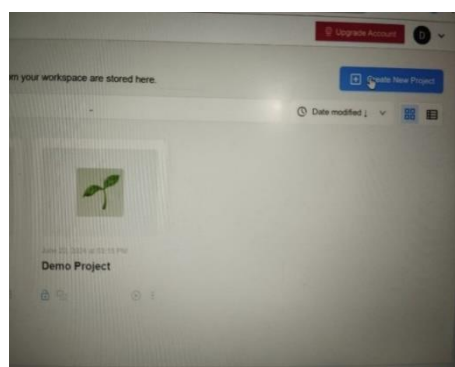


Figure 3. Tap the Create new project button at the top left

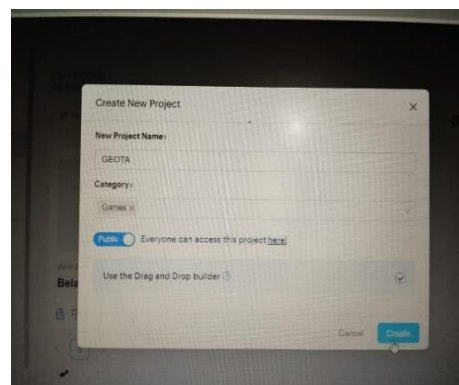


Figure 4. Give it a name and choose a category

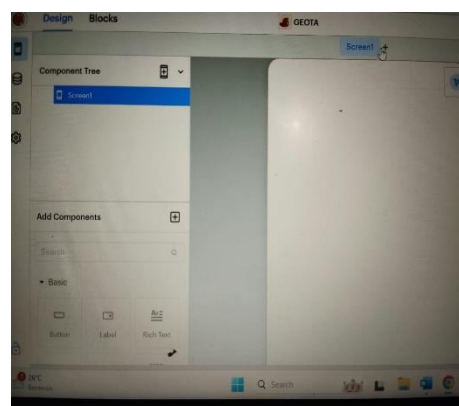


Figure 5. Add the required components

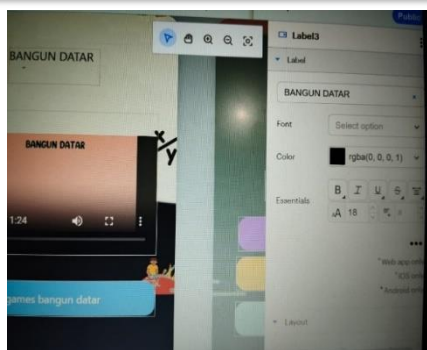


Figure 6. Set Background and writing in the left space

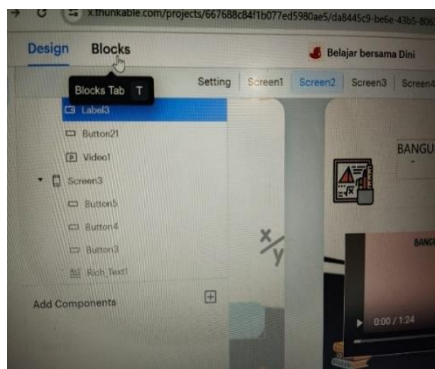


Figure 7. Press Blocks to organize components

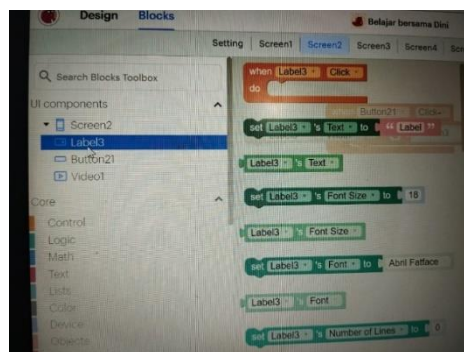


Figure 8. Arrange the components according to the learning to be created.

CONCLUSION

The need for an understanding of geometry mathematics in honing children's intelligence. In addition to formulas, children are also taught to have numerical skills in solving geometry problems. However, there are still many children who have difficulty learning geometry mathematics, especially for children with disabilities. The need for the right media in learning for children with mild intellectual disabilities. The media used is expected to be an interactive learning process. The use of artificial intelligence as a learning medium can help teachers in developing students' interests and learning abilities. The use of artificial intelligence in learning geometry mathematics for students with mild intellectual disabilities is usually by using an image of an object or multimedia in the form of videos and quizzes.

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Metaphorical Thinking Approach as a Strategy for Solving Algebraic Problems in the Daily Life of Phase D Students in Mathematics Learning

Catherine Mentaya Kursius^{a)}, Istadi Istadi^{b)}, and Anwar Muttaqien^{c)}

Department of Mathematics Education, Faculty of Teacher and Education
University of Muhammadiyah Sampit, Central Borneo, Indonesia

Email: catherinementaya@gmail.com^{a)}; addysahabatmu@gmail.com^{b)}; anwarmuttaqien1503@gmail.com^{c)}

ABSTRACT

The *Metaphorical Thinking* approach in learning mathematics algebra material in the Independent Curriculum provides students with a more meaningful experience of the understanding process because they can see, form and map mathematical concepts to experiential concepts to practice solving everyday life problems in Algebraic form. This research is a library research study supported by interviews at SMP Negeri 3 Sampit. The research was carried out by collecting data from various sources regarding the difficulties of Phase D (SMP) students in algebra material and the metaphorical thinking approach to see the achievement of meaningful understanding of mathematics. With the characteristics of Metaphorical Thinking, students can carry out mathematical problem-solving activities, especially algebraic mathematical problems, so as to find meaningful understanding. Then carry out data analysis using descriptive analysis to determine the effect of the metaphorical thinking approach on the daily life problem solving abilities of phase D students in algebra material.

Keywords: *Metaphorical Thinking*, Problem Solving, Algebra

ABSTRAK

Pendekatan *Metaphorical Thinking* dalam pembelajaran matematika materi aljabar pada Kurikulum Mandiri memberikan pengalaman yang lebih bermakna pada siswa dalam proses pemahaman karena siswa dapat melihat, membentuk dan memetakan konsep-konsep matematika ke konsep-konsep pengalaman untuk berlatih memecahkan masalah kehidupan sehari-hari dalam bentuk Aljabar. Penelitian ini merupakan penelitian kepustakaan yang didukung dengan wawancara di SMP Negeri 3 Sampit. Penelitian dilakukan dengan mengumpulkan data dari berbagai sumber mengenai kesulitan siswa Tahap D (SMP) dalam materi aljabar dan pendekatan *metaphorical thinking* untuk melihat pencapaian pemahaman matematika yang bermakna. Dengan karakteristik *Metaphorical Thinking*, siswa dapat melakukan kegiatan pemecahan masalah matematika khususnya masalah matematika aljabar, sehingga dapat menemukan pemahaman yang bermakna. Kemudian melakukan analisis data dengan menggunakan analisis deskriptif untuk mengetahui pengaruh pendekatan *metaphorical thinking* terhadap kemampuan pemecahan masalah kehidupan sehari-hari mahasiswa fase D pada materi aljabar.

Kata Kunci: Berpikir Metaforis, Pemecahan Masalah, Aljabar

INTRODUCTION

We often face problems in everyday life, where mathematics is needed to solve them [1]. Mathematics is one of the subjects studied at every level of education and is still considered difficult. This is because the object of mathematical study is abstract and full of formulas that must be understood and comprehended [2]. Mathematics cannot be separated from symbols as representations of abstract things. Mathematical problems are represented in the form of symbols, diagrams or other forms to find solutions [3]. Sense symbols or sensibility symbols have an important role in understanding mathematical problems that contain many symbols, one of which is algebra problems [4].

Education provided in schools must be delivered effectively and efficiently [5]. An independent curriculum provides freedom for students, teachers and educational units to innovate. With the aim of being in line with the Pancasila student profile, namely lifelong learning, learning that

focuses on building student characteristics [6]. Algebra is a mathematics subject that studies mathematical symbols and the rules for manipulating these symbols, where in algebra there are terms such as coefficients, variables and constants [7]. Algebra is still considered difficult by students who are just learning it, giving rise to several mistakes experienced by students in solving the main problems of algebra [8].

Survey results from the *Indonesia Mathematics and Science Teacher Education Project* (IMSTEP) and the *Japan International Cooperation Agency* (JICA), one of the causes of the low quality of student understanding in mathematics is that teachers concentrate too much on procedural and mechanistic matters such as teacher-centred learning, mathematical concepts. delivered informatively, and students are trained to solve many questions without in-depth understanding connected to the surrounding environment [9]. As a result, students' mathematical connection and communication abilities do not develop as they should [10]. This algebra material can be said to be students' initial mathematical capital which is introduced at the Junior High School (SMP) Phase D level. The metaphorical thinking

approach is a method that prepares students for situations where students think in their own way in observing events around them and presenting abstract mathematical concepts in their own way. concepts in daily life that are more concrete by comparing two things with different meanings [11].

By using metaphorical thinking, students' understanding process becomes more meaningful (meaningful understanding) because they can see, form and map mathematical concepts to experiential concepts or vice versa [9]. Metaphorming provides an opportunity for every individual to have brilliant ideas. Hendriana (2012) states that metaphorical thinking is a thinking process using metaphors to understand a concept. Lai (2013) stated that metaphor is not just an expression in language but a way of thinking. Metaphors are a fundamental part of mathematical thinking, in other words metaphors are an understanding of certain experiences that are applied to other things [12].

A metaphor is an idea to relate the problems faced with everyday experiences and familiar mathematical material. The steps for *metaphorical thinking* according to Sunito (2013) are as follows.

Table 1. *Metaphorical thinking process*

Process	Indicator
<i>Connect</i>	Connecting two different ideas (material).
<i>Relate</i>	Connecting different ideas with knowledge that is more familiar to students
<i>Explore</i>	Making Models Describe what two ideas have in common
<i>Analyze</i>	Review the steps that have been taken previously
<i>Transform</i>	Interpret and conclude information based on what has been done
<i>Experience</i>	Apply the results obtained on problems faced

It is hoped that this will make students realize that mathematics is not a difficult, uninteresting and boring subject, but on the contrary mathematics is a very interesting and fun subject. According to Joyce, Calhoun, and Hopkins in [13], defines the metaphorical thinking approach as a learning designed to develop students' unconventional way of thinking, but provides opportunities to create new ways of looking around, new ways of expressing themselves, and new ways of approaching problems.

In metaphorical thinking, students are invited to see learning. Metaphors are used to form understanding through the internal relationship of contextual elements [14]. According to Lakoff and Johnson's cognitive theory, the process of understanding/compiling abstract concepts through concrete experiences is called metaphor. Furthermore, Lakoff and Johnson argued that metaphor connects two conceptual domains, namely the source domain and the target domain. The source domain is contextual elements consisting of a set

of entities, attributes or processes that are literally connected, and stored in the mind. The target domain tends to be more abstract and follows the structure of the source domain through mapping.

Students' knowledge and understanding of mathematical concepts according to NCTM (2000) can be seen from students' abilities in several criteria, namely defining concepts verbally and in writing, making examples and non-examples, using symbols to present a concept, changing a form of representation. to other forms, getting to know the various meanings and interpretations of concepts, identifying the properties of a concept and getting to know the conditions that determine a concept, as well as comparing and contrasting concepts [15].

RESEARCH METHODOLOGY

This research is a library research study. This research is a type of research whose data comes from literature such as journal articles, books and interviews. The research was carried out by collecting data from various sources regarding students' difficulties in algebra material and the metaphorical thinking approach to see the achievement of meaningful understanding of mathematics. Literature study research is research conducted based on literature, so the data collection method used is documentation, namely tracking sources consisting of various themes and topics related to metaphorical thinking research. The literature review carried out was sourced from various databases such as interviews with mathematics teachers at SMP Negeri 3 Sampit, Google Scholar, Portal Garuda and Eric with the search keyword "*metaphorical thinking* of phase D students in Algebra material".

The data obtained was analyzed using a descriptive method, namely explaining what was of concern in the research. The initial step of this research is to collect and study data from previous research which has the same theme and topic. Then carry out data analysis using descriptive analysis to determine the effect of the metaphorical thinking approach on the achievement of meaningful understanding of phase D students in algebra material.

RESEARCH RESULT

Until now, education remains the government's main concern in improving the capabilities of Indonesia's human resources. The launch of the Independent Learning Program by the Ministry of Education and Culture shows that the Indonesian Minister of Education does not want to make learning activities something that becomes a burden for students in Indonesia [16].



Figure 1. Algebra learning media at SMP Negeri 3 Sampit

In this study, researchers found that learning with a metaphorical thinking learning approach can improve students' mathematical communication skills in terms of expressing everyday events in mathematical language, presenting mathematical statements in written and pictorial form, and drawing conclusions from statements. Metaphors are tools for conceptualizing abstract concepts and are not carried over to concrete and known concepts [17].



Figure 2. Documentation of making Algebra learning media at SMP Negeri 3 Sampit

Metaphorical thinking is a process where students learn to use metaphors to understand a concept. Starting from concepts that students already know, either based on previous experience or knowledge, towards understanding the concept being studied. In learning metaphorical thinking, the teacher designs a learning process that starts from contextual problems. Next, students are invited to think about ideas in interpreting the mathematical concepts being studied using metaphors [18]. According to research by [12] in [19] metaphorical thinking consists of three conceptual forms as in the following table.

Table 2. Conceptual forms of *metaphorical thinking*

Conceptual forms	Indicator
<i>Grounding metaphors</i>	The basis for understanding mathematical ideas that are connected to real phenomena in everyday life
<i>Linking metaphors</i>	Building a connection between two things
<i>Redefinitional metaphors</i>	Redefine the examples that have been designed, then adapt them to the mathematical topics being studied

Based on the results of interviews at SMP Negeri 3 Sampit, in teaching mathematics metaphorical thinking begins with modeling a real situation, then the model is interpreted from a semantic point of view. By using metaphors, students connect mathematical concepts with concepts that students are familiar with in everyday life.



Figure 3. Interview with a mathematics teacher at SMP Negeri 3 Sampit

By using metaphors, students connect mathematical concepts with concepts that students are familiar with in everyday life. Based on the description of the research results above, there are stages of mathematics learning in an approach using metaphorical thinking as follows.

First stage

Providing contextual problems

The teacher begins learning by providing contextual problems related to the material to be studied.

Second stage

Identify the main concepts

Students illustrate the main concepts of the contextual problem that has been given.

Third stage

Using metaphors to illustrate concepts

The teacher provides examples of metaphors to illustrate models of contextual problems related to the material to be studied, then students convey their own metaphors or examples to illustrate the concept.

Fourth stage

Conclusion

The teacher reminds them of the core concepts of the problem related to the main material being studied in order to build their long-term memory. Then the teacher and students discuss the foundations of metaphorical thinking by analyzing the reasons behind the chosen metaphor. Finally, they gain meaningful understanding.

DISCUSSION

The Metaphorical Thinking approach can also be applied in the mathematics learning process, in this case algebra material. The application is by connecting mathematical concepts with concepts known to students, expressing the form of mathematical concepts in language that is easy to understand to show students' understanding of the concepts being studied.

First lesson

The teacher begins learning by presenting a contextual problem that is relevant to everyday life. For example, if we shop for a number of items at the market, this is a real phenomenon which we will metaphorize in algebraic form, we will code or describe each item as follows.

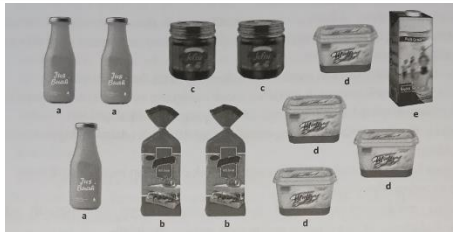


Figure 4. Shopping for goods from the market

Write down the algebraic form of these objects!

From these contextual problems, students are guided to simplify existing mathematical forms. Based on the illustration, 5 types of goods are obtained, including the following.

a = Fruit juice
 b = Sandwiches
 c = Jam
 d = Ice cream
 e = UHT Milk

From these questions, students obtain the following mathematical form:

$$a + a + b + c + d + e + a + b + c + d + d + d$$

This form can be simplified by grouping similar metaphors to become:

$$(a + a + a) + (b + b) + (c + c) + (d + d + d + d) + e = 3a + 2b + 2c + 4d + e$$

The form $3a + 2b + 2c + 4d + e$ is called algebraic form,

a, b, c, d and e are called variables.

3,2,2,4 and 1 are called coefficients.

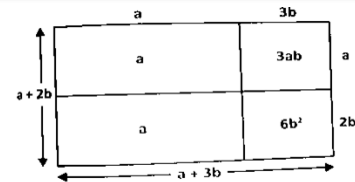
Then students process the reverse understanding to metaphorize the existing mathematical form into another contextual problem, then solve it. If we have the algebraic form: $x = y + 9$. Students can express the algebraic form with Jecky's age being 9 years older than Dona's age. Let's say that Jecky's age is x years and Dona's age is y years. From this relationship, if we know Dona's age, we can find out Jecky's age.

On the other hand, we can also metaphorize the form $x = y + 9$ as a vessel that has been filled with 9 liters of water and y is the amount of water added to the vessel. If 1 liter of water is added to the vessel (y), the amount of water in the vessel will be 10 liters (x).

Second lesson

After students learn to simplify algebraic forms by adding, they are guided to calculate multiplication between algebraic forms. The teacher first states an algebraic form, then metaphorizes it into a contextual problem and solves it.

For example, we will write the product: $(a + 3b)(a + 2b)$
 So we metaphorize $(a + 3b)$ as the length of a rectangle and $(a + 2b)$ as the width of a rectangle, as in the following image:



Based on the algebraic metaphor of the sides of a rectangle above we get:

$$(a + 3b)(a + 2b) = a^2 + 3ab + 2ab + b^2 = a^2 + 5ab + b^2 \text{ (algebraic multiplication result).}$$

Third lesson

From the algebra that has been studied in the two previous lessons, the teacher checks students conceptual understanding and gives students the opportunity to communicate their understanding in their own language and provide appropriate metaphors for their explanations, the subject we are discussing this time, namely Algebraic Forms, Algebraic addition and multiplication.

This activity is carried out with the aim of achieving meaningful understanding for phase D students after following the metaphorical thinking process in algebra material so that students have long term memory in relating mathematical problems to real phenomena that exist in everyday life. A problem is a situation that has a way to be solved in the form of a mathematical model [20].

CONCLUSION

Based on the research results, it was concluded that students with good metaphorical thinking skills met the three indicators of metaphorical thinking ability used in this research. Based on the research results, it was found that students were able to communicate a concept into a mathematical model by connecting several mathematical concepts. As well as being able to understand basic concepts and using appropriate formulas using algebraic operations and processes and students are able to explain the systematicity of problem-solving results in real phenomena in detail in solving algebraic mathematical problems. By using metaphorical thinking, students understanding process becomes more meaningful because they can see, form and map mathematical concepts to experiential concepts.

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