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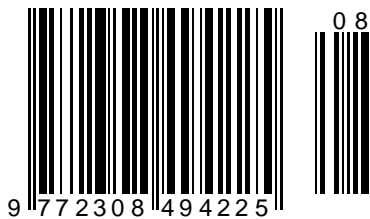
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## FINANCIAL LITERACY MODEL IN IMPROVING FINANCIAL MANAGEMENT IN MSMEs

**Abstract:** This study examines the moderating effect of information technology and financial inclusion on the relationship between financial literacy with the financial management of MSMEs in the Siak Districts, Siak Regency. The sampling method was non-probability by using incidental and snowball sampling techniques. This study uses primary data from distributing questionnaires and secondary data from the Office of Cooperatives and Micro, Small, and Medium Enterprises in Siak Regency. The data analysis model in this study uses a moderated regression analysis (MRA) approach. The results of this study indicate that information technology and financial inclusion can moderate the effect of financial literacy on the financial management of MSMEs. The results of this study are expected to be a consideration for MSME actors to manage their finances.

**Key words:** Financial Literacy, Information Technology, Financial Inclusion, Financial Management, Micro, Small, Medium Enterprises.

**Language:** English

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### Introduction

Micro, Small, and Medium Enterprises (MSMEs) are Indonesia's economic backbone. Based on data from the Ministry of Cooperatives and Small and Medium Enterprises, 99% of businesses formed in Indonesia are MSMEs. Although MSMEs play an essential role in the Indonesian economy, managing MSME finances is complicated. Based on a study presented by Forbes.com, 8 out of 10 small business

actors fail in the second year due to financial management problems.

The challenges for MSME entrepreneurs amid the current Covid-19 pandemic are becoming increasingly complex. The Ministry of Finance stated that four sectors were most depressed due to the Covid-19 outbreak, one of which was MSMEs. It is due, among others, to large-scale social restrictions and the enactment of policies on working and

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studying from home and minimizing the frequency of going out. As a result of this policy, MSMEs experienced cash flow disruptions and decreased sales, which impacted the business' ability to meet its credit obligations. It shows that financial management is essential for MSME entrepreneurs to face various challenges in difficult times like today ([www.ojk.go.id](http://www.ojk.go.id)).

Many MSME entrepreneurs encounter problems managing their finances, impacting their cash flow efficiency. These financial management problems are caused by a lack of discipline in recapitulating financial records, and MSME entrepreneurs frequently mix their personal fund accounts and business accounts. It will undoubtedly impact the business continuity; therefore, MSME entrepreneurs need to carry out financial management in their business to run well and continue to grow.

Financial management is all company activities related to how to obtain funds, use funds, and manage assets following the company's overall objectives (Harjito&Martono, 2012). Knowledge of good financial management can assist MSME entrepreneurs in making the right business management decisions, resulting in good financial management behavior and business development.

Several financial management processes must be carried out in the financial management of SMEs or companies. According to Mulyawan (2015: 49), there are processes and stages of financial management, namely Planning (Financial Forecasting), Implementation (Planning and Budgeting), and financial control.

MSME entrepreneurs must understand financial literacy To improve financial management in MSMEs. It is because financial literacy can assist in understanding financial management and opportunities to increase business growth and development. Financial literacy is critical for someone to make decisions, especially those related to daily activities in deciding to save or invest to achieve predetermined goals.

Proper financial management must be supported by good financial literacy. Regardless of the high-income MSMEs earn, achieving the expected profits and goals will not be accessible without proper management. MSME entrepreneurs with high financial literacy will have skills in managing their finances, making financial decisions relevant to information and minimizing opportunities for making financial mistakes, having investments in the capital market, and can minimize and overcome financial problems. In addition to financial literacy, other factors that support the relationship of financial literacy to financial management in MSMEs are information technology and financial inclusion.

The community's increasingly complex activities and needs cannot be separated from the assistance of information technology, including in the

financial sector. Moreover, during the COVID-19 pandemic, the public is required to limit social interaction to reduce the spread of the virus, so the use of information technology, especially the internet, is an option for MSME entrepreneurs in running their businesses.

MSMEs entrepreneurs can access and get information about financial literacy easily and quickly through information technology such as social media, the internet, and mobile phones. It will also help MSME entrepreneurs in managing their finances. Utilization of information technology to improve understanding of financial literacy can be done, among others, by creating a digital literacy platform as a medium for socialization and financial education; distance interactive learning for informal training as well as for learning purposes regarding financial management, social media (Whatsapp, Telegram, Facebook, Instagram) and streaming (Zoom, Webex, Webinars, Skype, etc.) seminars, interactive dialogues, and conferences related to financial management. Information technology is hoped to increase the MSME entrepreneurs' financial literacy and eventually increase financial management.

In addition, to support from the use of information technology, financial inclusion also plays a role in the relationship between financial literacy and financial management in MSMEs. In the OJK (Indonesia's Financial Services Authority) regulation, financial inclusion is defined as the availability of access to various financial institutions, products, and services that follow the community's needs and abilities to improve the community's welfare. The components to improve financial inclusion are access, availability, use, and quality (Financial Services Authority Regulation No. 76/POJK.07/ 2016, 2016).

The community, including MSMEs, encounter obstacles in accessing financial institutions. It results in low MSME financing, high microcredit interest rates, bank monopoly in the micro sector, and limited distribution channels for financial services. It is the reason for the urgency of implementing financial inclusion. Indonesia has several excellent programs to support this financial inclusion program, including the procurement of People's Business Credit (KUR), the TabunganKU Program, E-Money, Telkomsel Cash, and the "To Bank" Program, and improving microfinance services. These programs were created to make it easier for the public to access financial services.

The Financial Services Authority (2016) explained that increasing financial literacy and inclusion is believed to develop MSMEs because MSME entrepreneurs can better understand the basic concepts of financial products and carry out better financial planning and management. Understanding financial literacy with the support of open access to

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financial inclusion will impact financial management MSMEs positively.

Several previous studies have been carried out, including Rumbianingrum and Wijayaangka (2018), who conducted a study on MSMEs fostered by the Misykat DPU DT Multipurpose Business-Cooperative in Bandung Raya. The results show that financial literacy affects financial management. These results are supported by studies conducted by Coskuner (2017), Dai and Suryanto (2018), and Saadah (2020). Different results were found by Gunawan, Pirari, and Sari (2020), who conducted a study on students of the Management Study Program, Faculty of Economics and Business, University of Muhammadiyah North Sumatra, which proved that financial literacy did not affect financial management.

Besides financial literacy, financial inclusion is also suspected of affecting MSMEs' financial management. A study conducted by Susilawati and Puryandani (2020) on the Furniture Cluster in Semarang City found that financial inclusion moderates the relationship between financial literacy and capital structure decisions. In this case, the capital structure decision is one form of decision-making related to financial management carried out by MSME entrepreneurs.

With different variables, the results proven in the studies above are also different and still show inconsistencies in the results. The difference between this study and previous studies is that the researchers add variables to the use of information technology and conducts the study in different locations.

This study was conducted on MSMEs in the Siak District, Siak Regency. The research location was selected because the same study has never been done at the selected location. Then secondly, the business potential of MSMEs in the Siak Regency area is quite significant. It is indicated by the large number of types of sector businesses in each sub-district. It is undoubtedly crucial for MSMEs to manage their finances so they can continue to grow and develop. Based on the background above, the aims and objectives to be achieved in this study are to determine and analyze whether financial literacy directly affects MSME financial management and whether the use of information technology and financial inclusion moderates the effect of financial literacy on MSME financial management.

### Framework and Hypotheses Development

#### a. The Effect of Financial Literacy on MSME Financial Management

Financial management is all company activities related to obtaining funds, using funds, and managing assets following the company's overall objectives (Harjito&Martono, 2012). Financial management in MSMEs means all MSME activities, including

obtaining MSME funding sources and using the obtained funds. Based on Financial Services Authority Regulation No. 76/POJK.07/2016, financial literacy is knowledge, skills, and beliefs that influence attitudes and behavior to improve the quality of decision-making and financial management to achieve prosperity.

By understanding financial literacy, MSME owners and employees can manage MSME finances well. If MSME finances can be appropriately managed, MSME entrepreneurs can make cost efficiency and maximize profits.

Financial literacy is also a must for everyone to avoid financial problems because someone is often faced with a trade-off, namely a situation where someone has to sacrifice one of his interests for the sake of another. Proper financial management must be supported by good financial literacy. Regardless of the high-income MSMEs earn, achieving the expected profits and goals will not be accessible without proper management. MSME entrepreneurs with high financial literacy will have skills in managing their finances, making financial decisions relevant to information and minimizing opportunities for making financial mistakes, having investments in the capital market, and can minimize and overcome financial problems.

Based on the framework above, the first hypothesis proposed is:

H1: Financial literacy affects the SMEs' financial management

#### b. The Use of Information Technology Moderates the Effect of Financial Literacy on MSME Financial Management

Information technology includes hardware and software to perform one or several data processing tasks such as searching, transmitting, storing, retrieving, manipulating, and displaying data (O'Brien and Marakas, 2014: 138). The internet, one of information technology, is an information resource that can reach the whole world.

The community's increasingly complex activities and needs cannot be separated from the assistance of information technology, including in the financial sector. Moreover, during the COVID-19 pandemic, the public is required to limit social interaction to reduce the spread of the virus, so the use of information technology, especially the internet, is an option for MSME entrepreneurs in running their businesses.

MSMEs entrepreneurs can access and get information about financial literacy easily and quickly through information technology such as social media, the internet, and mobile phones. It will also help MSME entrepreneurs in managing their finances. Utilization of information technology to improve understanding of financial literacy can be done, among others, by creating a digital literacy



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platform as a medium for socialization and financial education that can reach various regions including remote areas, all levels, and all walks of life; using LMS-based media (moodle, classroom) for distance interactive learning and informal training as well as for learning purposes regarding financial management, social media (Whatsapp, Telegram, Facebook, Instagram) and streaming (Zoom, Webex, Webinars, Skype, etc.) seminars, interactive dialogues, and conferences related to financial management. Information technology is hoped to increase the MSME entrepreneurs' financial literacy and eventually increase financial management.

Based on the framework above, the second hypothesis proposed is:

H2: The use of information technology moderates the effect of financial literacy on financial management in MSMEs

c. Financial Inclusion moderates the effect of financial literacy on financial management in MSMEs

OJK in the Indonesian Financial Literacy National Strategy (Revisit 2017) defines financial inclusion as access to financial products and services that are useful and affordable in meeting the needs of the community and their businesses. In this case, transactions, payments, credit savings, and insurance are used responsibly and sustainably. The businesses implied include micro, small, and medium enterprises.

The community, including MSMEs, encounter obstacles in accessing financial institutions. It results in low MSME financing, high microcredit interest rates, bank monopoly in the micro sector, and limited distribution channels for financial services. It is the reason for the urgency of implementing financial inclusion. Indonesia has several excellent programs to support this financial inclusion program, including the procurement of People's Business Credit (KUR), the TabunganKU Program, E-Money, Telkomsel Cash, and the "To Bank" Program, and improving microfinance services. These programs were created

to make it easier for the public to access financial services.

The Financial Services Authority (2016) explained that increasing financial literacy and inclusion is believed to develop MSMEs because MSME entrepreneurs can better understand the basic concepts of financial products and carry out better financial planning and management. Understanding financial literacy with the support of open access to financial inclusion will impact financial management MSMEs positively.

Based on the framework above, the third hypothesis proposed is:

H3: Financial Inclusion moderates the effect of financial literacy on financial management in MSMEs

### Research Method

The study was conducted on MSMEs in the Siak District, Siak Regency, Riau Province, for six months, from June to November 2021. The population in this study were all MSMEs in the Siak District, Siak Regency, with a total of 467 MSMEs. The sampling method used is incidental sampling and snowball sampling. Incidental sampling is a technique used for sampling based on chance, meaning that anyone who meets the researcher can be used as a sample provided that the researcher sees the person as worthy of being used as a data source (Sugiyono, 2015). Snowball sampling is a technique for determining the sample which is initially small in number, then enlarges (Sugiyono, 2013).

Data collection techniques used in this study are in 2 ways, namely library research through collecting secondary data and field research through questionnaires. The variables in this study are divided into three, namely independent variables (consisting of innovation, financial inclusion, and financial literacy), the moderating variable (using information technology), and the dependent variable (the financial performance of SMEs). Operational definitions and measurement of data variables are presented in the following table:

**Table 1. Operational Definition and Variable Measurement**

No.	Variable	Indicators	Source
1	Financial Management	(1) Financial Plan (2) Financing (3) Financial Recording and Reporting (4) Financial Control	Modified theory from Mulyawan (2015: 31) and Abanis, Sunday, Burani&Eliabu (2013)
2	Financial Literacy	(1) <i>Behavior</i> (2) <i>Skills</i> (3) <i>Knowledge</i> (4) <i>Attitude</i>	Bongomin, Munene &Nabeta (2016)
3	Using Information Technology	(1) Information about products and services (2) Assist with online transactions (3) Interaction between customer and Entrepreneur (4) Connections between suppliers and entrepreneurs	Adapted from Zhu and Kreamer (2002) (Hsu, 2012), Maharani, Ali

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		(5) Promotional media (6) Means of obtaining market research (7) Knowing the development of competitors (8) Better-known brand (9) Often use the internet in business activities	&Astuti (2012), Sari and Hanoum (2012)
4	Financial Inclusion	(1) Access Availability (2) Cash Usage (3) Quality (4) Welfare	Yanti (2019)

This study uses a simple regression analysis approach to test the first hypothesis and moderated regression analysis (MRA) to test the second and third hypotheses. The researchers analyzed the data using

SPSS Statistics v22.0.

### Result and Discussion

**Table 2. Sample and Questionnaire Return Rate**

Notes/Information	Total	Percentage (%)
The questionnaire sent was 183 copies	183	100
The questionnaires that do not return	0	0
Returning Questionnaire	183	100
Questionnaires that can be used in research	183	100

Source: Processed Data, 2021

In snowball sampling, initial identification started with a person or case that meets the criteria. Then, the next respondent or the next sample unit can be found based on direct or indirect linkages in a network. Then, this sampling process continued until sufficient information was obtained and a sufficient and accurate number of samples could be analyzed to

draw conclusions. From the survey conducted during the sampling process, 183 samples were obtained as representatives for filling out the questionnaire in this study. Of the 183 questionnaires, the returning questionnaires were 183 or 100%. All returning questionnaires can be analyzed because they are filled out completely.

**Table 3. Hypothesis Testing Results**

Model	t count	Sig.
Financial Literacy on MSME Financial Management (H <sub>1</sub> )	2,57	0,000
Financial Literacy*Using Information Technology (X*M <sub>1</sub> ) (H <sub>2</sub> )	2,261	0,025
Financial Literacy*Financial Inclusion (X*M <sub>2</sub> ) (H <sub>3</sub> )	0,847	0,398

Source: Processed Data, 2021

Based on the hypothesis testing results above, for the first hypothesis, the results of t arithmetic show a number greater than the t-table (1.98), and the significance is smaller than 0.05. Thus this study proves that financial literacy has a significant effect on the financial management of SMEs. It means that MSME entrepreneurs with good financial literacy in Siak District, Siak Regency, can manage their business finances well. This study results support the result of studies conducted by Rumbianingrum&Wijayaangka (2018), Coskuner (2017), Dai and Suryanto (2018), and Saadah (2020).

Furthermore, from the second hypothesis testing results, the t-count also shows a more significant number than the t-table (1.98), and the significance is

smaller than 0.05. Thus, this study proves that using information technology can moderate the effect of financial literacy on the financial management of MSMEs. Through information technology such as social media, the internet, and mobile phones, MSME entrepreneurs in Siak District, Siak Regency can access and obtain information about financial literacy easily and quickly. It will eventually help MSME entrepreneurs in managing their finances.

From the third hypothesis testing results, the t-count shows a smaller number than the t-table (1.98), and the significance is more significant than 0.05. Therefore, the results of this study prove that financial inclusion cannot moderate the effect of financial literacy on the financial management of MSMEs.

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From observations and interviews with the MSMEs studied, data and conclusions obtained that access to financial services for MSMEs in Siak Regency is still uneven, or around 79.1% of the community is classified as "unbankable" or has not been touched by financial access. Therefore, the influence of financial literacy on financial management may be strengthened or weakened by variables other than financial inclusion.

### Conclusion And Suggestion

From the results of this study, researchers can conclude as follows:

- a. Financial literacy has a direct effect on the financial management of MSMEs.
- b. The use of information technology moderates the effect of financial literacy on financial

management in MSMEs.

- c. Financial inclusion cannot moderate the effect of financial literacy on MSME financial management.

Based on the results of this study, the suggestions that can be given both for MSMEs and for further research are:

- a. MSMEs can manage their finances well if MSME entrepreneurs have good financial literacy and are supported by using information technology.
- b. Further research is expected to expand the object of research and take different populations so that the results can be generalized and add other variables to be studied.

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	<b>GIF (Australia) = 0.564</b>	<b>ESJI (KZ) = 8.771</b>	<b>IBI (India) = 4.260</b>
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Article



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## MEASUREMENT OF NURSES' PHYSICAL AND MENTAL WORK LOAD ON WORK STRESS LEVEL AND PERFORMANCE IN DUMAI CITY HOSPITAL

**Abstract:** This research was purposed to find out the analysis of nurses' physical and mental work loads on work stress and performance in Dumai City Hospital. The population were 391 nurses and the sample were 80 nurses. The data used in this study is primary data and the analysis tool used in this study is path analysis with nurses' performance as the dependent variable, work stress as the intervening variable, and two independent variables are physical work loads and mental work loads. The result of the study found shows that: 1) Physical work loads give significant effect on the work stress 2) Mental work loads give significant effect on the work stress 3) Physical work loads give significant effect on the performance. 4) Mental work loads give significant effect on the performance. 5) Work stress gives significant effect on the performance. 6) Physical work loads give significant effect on the performance through work stress. 7) Mental work loads give significant effect on the performance through work stress.

**Key words:** Physical Work Loads, Mental Work Loads, Work Stress, Performance.

**Language:** English

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### Introduction

The world is currently experience an outbreak of a virus called coronavirus disease 2019 (COVID-19) which was caused by severe acute syndrome coronavirus-2 (SARS-CoV-2). Coronavirus is a virus that attacks the respiratory system. The corona virus can cause minor disorders of the respiratory system, and severe lung infections, even death. This virus can be transmitted from human to human and has spread widely which initially occurred in China, and now more than 190 countries including Indonesia is struggling to resolve. The spread of this disease has given broad social and economic impacts.

Severe acute respiratory syndrome coronavirus 2 (SARSCoV- 2), better known as the Coronavirus, is a new type of corona virus that is transmitted to humans. This virus can affect anyone, including infants, children, adults, the elderly, pregnant women, and breastfeeding mothers. Coronavirus is a collection of

viruses that can infect the respiratory system. In many cases, this virus only causes mild respiratory infections, such as flu. However, this virus can also cause severe respiratory infections, such as lung infections (pneumonia).

The issue of manpower is one of the most common problems that developing countries must face and resolve, especially in Indonesia. Manpower is one of the most important sectors in an effort to advance national development because it is related to the welfare of the community. According to Suroto and Tindaon (2010), labor / manpower is a driving force in development, which acts as a resource to carry out the process of production and distribution of goods or services, as well as a target to revive and develop markets.

In the context of ergonomics, every workload received by a person must be balanced both against physical abilities, cognitive abilities and human

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limitations who accept the burden. The goal to be achieved is to ensure that the work system is designed in such a way as to obtain the best productivity and work quality, which can be achieved if the load is within the limits of physical ability.

In carrying out work activities, humans experience a physical and mental workload in which when it is done continuously, it will cause fatigue and work stress besides it will have an impact on performance. Tika (2006) stated that performance is the results of the work function / activity of a person or group in an organization which is influenced by various factors to achieve organizational goals within a certain time period.

The work done by workers can give its own burdens to themselves, in terms of physical, mental and social. Employees' performance appraisal is one way to optimize employees' work results so that they can carry out their duties and responsibilities better.

This study was conducted at the Dumai City Hospital because this hospital can be accessed by the people living in Dumai City who want come for a treatment for the diseases they suffer from. This, of course, has made the nurses working in this hospital is facing various conditions. They are required to work in accordance with the standards set by the hospital and provide satisfaction for patients, while on the other hand they have needs and desires that need attention from the relevant agencies. This condition will certainly cause work stress and can also affect the decline in nurses' performance.

The increasing workload experienced by nurses due to the demands of professionalism implicate the nurses in the emergence of psychological pressures in the form of job stress caused by workloads and working conditions (Anil JC, 2010).

### Literature Review Performance

Performance is sometimes be interpreted as the result of work or work performance. Performance is about doing the job and the results it achieves. Performance is the result or level of success of a person as a whole during a certain period in carrying out a task compared to various possibilities, such as work standards, targets or criteria that have been determined in advance that have been mutually agreed upon (Rivai and Basri, 2005).

Performance indicators, are:

- Interpersonal Communication
- Ethics and Etiquette
- Good Nursing Care
- Organizing Work
- Knowledge

### Work Stress

Work stress is all stimulations or actions from the human body, both from outside and inside the

body itself which can cause various adverse effects ranging from decreased health to suffering from a disease (Manuaba, 1998 in Tarwaka 2015: 374).

Work stress indicators are:

- Psychological reaction
- Social response
- Individual response
- Emotional response
- Physiological change
- Work performance
- Employee morale (Tarwaka, 2015)

### Physical Workload

Physical Workload is work that requires physical energy in human muscles which functions as a source of energy. Physical work is also called 'manual operation' where work performance will fully depend on human efforts which act as a source of energy and work controllers (Tarwaka, 2015: 107)

Physical workload indicators are:

- Respiratory
- Feelings of restlessness
- Body condition
- Difficulty to control attitudes (Tarwaka, 2015)

### Mental Workload

Mental Workload is a workload which becomes a gap between the workload demands of a task and the maximum capacity of a person's mental load in a motivated condition (Jex, 1988 in Tarwaka 2013)

Mental workload indicators are:

- Attention load (attention)
- Work ability
- Task load
- Physical load
- Psychic load
- Emotional load

### Research Method

The population of this study were all nurses in Dumai City Hospital, amounting to 391 people. The number of samples was determined as many as 80 nurses. The methods used in data collection are observation, questionnaire and interview. The data analysis used in this research is Path Analysis by using the SPSS version 24 application.

### Result and Discussion

#### Research Result

#### Validity and Reliability Testing

#### Validity Testing

The value of r table at a significant level of 5% alpha is equal to  $df = N-2$ ,  $df = 80-2$ ,  $df = 78$  and  $\alpha = 0.05$ , the r table value is 0.219. The following is the validity test table:

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**Table 1. Validity Testing**

Variable	Item	r value	r table	Judgment
Performance (Y2)	Y2_1	0.757	0.219	Valid
	Y2_2	0.687	0.219	Valid
	Y2_3	0.635	0.219	Valid
	Y2_4	0.741	0.219	Valid
	Y2_5	0.646	0.219	Valid
Work Stress (Y1)	Y1_1	0.359	0.219	Valid
	Y1_2	0.584	0.219	Valid
	Y1_3	0.723	0.219	Valid
	Y1_4	0.662	0.219	Valid
	Y1_5	0.607	0.219	Valid
	Y1_6	0.589	0.219	Valid
	Y1_7	0.710	0.219	Valid
Physical Workload (X1)	X1_1	0.809	0.219	Valid
	X1_2	0.839	0.219	Valid
	X1_3	0.869	0.219	Valid
	X1_4	0.724	0.219	Valid
Mental Workload (X2)	X2_1	0.811	0.219	Valid
	X2_2	0.823	0.219	Valid
	X2_3	0.871	0.219	Valid
	X2_4	0.789	0.219	Valid
	X2_5	0.796	0.219	Valid

Source: Processed Data, 2019

Based on Table 1, it can be seen that each statement item is valid. It is because the calculated r value is greater than the r table. So, this means that the data is valid.

**Reliability Testing**

Reliability can be calculated with the Alpha Cronbach. A variable is considered reliable if the Cronbach alpha value is above 0.60. The results of reliability testing can be seen in Table 2 below:

**Table 2. Reliability Testing**

Variable	Cronbach's Alpha	Score Critical	Judgment
Performance (Y2)	0.730	0.60	Reliable
Work Stress (Y2)	0.717	0.60	Reliable
Physical Workload (X1)	0.827	0.60	Reliable
Mental Workload (X2)	0.877	0.60	Reliable

Source : Processed Data, 2019

Based on Table 2, it shows that the Cronbach alpha coefficient value of all variables (x and y variables) is > 0.60. Then all variable statements are reliable.

**Classic Assumption Test**

**Normality Testing**

Here is the result of Normality Testing

**Table 3. Normality Testing Data Structure 1**

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N	80	
Normal Parameters,a,b	Mean	,0000000
	Std. Deviation	3.01983296

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<b>GIF (Australia)</b> = 0.564	<b>ESJI (KZ)</b> = 8.771	<b>IBI (India)</b> = 4.260
<b>JIF</b> = 1.500	<b>SJIF (Morocco)</b> = 7.184	<b>OAJI (USA)</b> = 0.350

Most Extreme Differences	Absolute	,091
	Positive	,052
	Negative	-,091
Test Statistic		,091
Asymp. Sig. (2-tailed)		,095c
a. Test distribution is Normal.		
b. Calculated from data.		
c Lilliefors Significance Correction.		

Source: Processed Data, 2019

**Table 4. Normality Testing Data Structure 2**

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		80
Normal Parameters <sup>a,b</sup>	Mean	,0000000
	Std. Deviation	1.83791915
Most Extreme Differences	Absolute	,085
	Positive	,043
	Negative	-,085
Test Statistic		,085
Asymp. Sig. (2-tailed)		,200c,d
a. Test distribution is Normal.		
b. Calculated from data.		
c Lilliefors Significance Correction.		
d. This is a lower bound of the true significance.		

Source : Processed Data, 2019

Based on the results of the normality test presented above, it can be seen that the significance value of each variable is greater than  $\alpha = 0.05$ . Thus, it can be concluded that all variables in this study are normally distributed.

**Multicollinearity Test**

**Here is the result of Multicollinearity Test**

**Table 5. Multicollinearity Testing Data Structure 1**

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	Collinearity Statistics	
		B	Std. Error	Beta	Tolerance	VIF
1	(Constant)	16.309	1.464			
	Physical Workload	,282	,115	,262	,654	1.528
	Mental Workload	,403	,093	,462	,654	1.528
a. Dependent Variable: Work Stress						

Source : Processed Data, 2019

**Table 6. Multicollinearity Testing Data Structure 2**

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	Collinearity Statistics	
		B	Std. Error	Beta	Tolerance	VIF
1	(Constant)	27.625	1.449			
	Physical Workload	-,250	,073	-,315	,607	1.648
	Mental Workload	-,226	,064	-,351	,527	1.899
	Work Stress	-,186	,070	-,252	,576	1.738
a. Dependent Variable: Performance						

Source : Processed Data, 2019



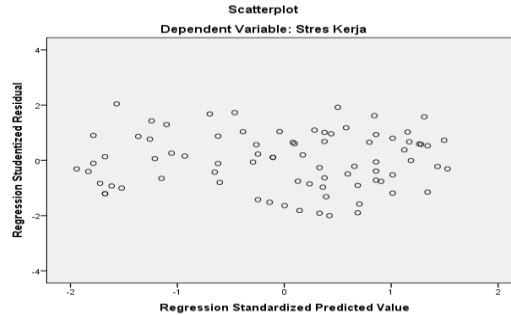
**Impact Factor:**

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<b>JIF</b> = 1.500	<b>SJIF (Morocco)</b> = 7.184	<b>OAJI (USA)</b> = 0.350

From Tables 3 and 4, it can be seen that the VIF value is <10 for all independent variables, as well as the tolerance value that is > 0.10. Thus, it can be concluded that there is no multicollinearity between the independent variables in this study.

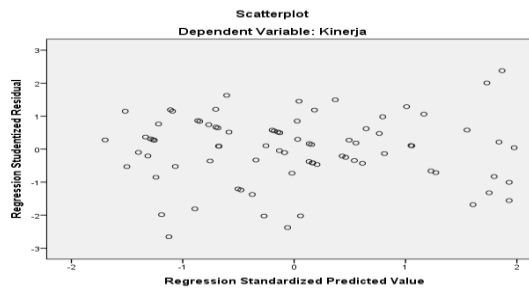
**Heteroscedasticity Test**

The following is a graphic for the result of the heteroscedasticity test



**Figure 1. Heteroscedasticity Test of Structure 1**

Source : Processed Data, 2019



**Figure 2. Heteroscedasticity Test of Structure 2**

Source : Processed Data, 2019

From the Scatterplot above, it can be seen that the data spreads randomly above and below point 0 on the Y axis, so there is no heteroscedasticity.

**Structural Test Results**

**F Test**

The F test is used to determine the joint effect of the independent variables on the dependent variable (Ghozali, 2013). If  $F_{value} > F_{table}$  then  $H_a$  is accepted or collectively the independent variable can explain the dependent variable together.

**Table 7. F Test of Data Structure 1**

ANOVAa						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	531.368	2	265.684	28.396	.000b
	Residual	720.432	77	9.356		
	Total	1251.800	79			
a. Dependent Variable: Work Stress						
b. Predictors: (Constant), Beban Kerja Mental, Beban Kerja Fisik						

Source : Processed Data, 2019

From Table 5 it is known that  $F_{Hitung}$  is 449.606 with a significance of 0.000. The F table can be obtained as follows:

$$\begin{aligned}
 F_{table} &= n - k - 1; k \\
 &= 80 - 2 - 1; 2 \\
 &= 77; 2 \\
 &= 3,12
 \end{aligned}$$

**Note**

- n : total sample
- k : number of independent variables
- 1 : constant

Therefore the F value (28,396) > F table (3,12) with Sig. (0,000) < 0,05. This means that the variables of physical workload and mental workload together have a significant effect on work stress.

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	<b>GIF (Australia) = 0.564</b>	<b>ESJI (KZ) = 8.771</b>	<b>IBI (India) = 4.260</b>
	<b>JIF = 1.500</b>	<b>SJIF (Morocco) = 7.184</b>	<b>OAJI (USA) = 0.350</b>

**Table 8. F Test of Data Structure 2**

ANOVAa						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	416.130	3	138.710	39.504	,000b
	Residual	266.858	76	3.511		
	Total	682.988	79			
a. Dependent Variable: Performance						
b. Predictors: (Constant), Work Stress, Physical Workload, Mental Workload						

Source : Processed Data, 2019

From Table 5 it is known that  $F_{Hitung}$  is 449.606 with a significance of 0.000. The F table can be obtained as follows:

$$\begin{aligned}
 F \text{ table} &= n - k - 1 ; k \\
 &= 80 - 3 - 1 ; 3 \\
 &= 76 ; 3 \\
 &= 2,72
 \end{aligned}$$

Note

n : total sample

k : number of independent variables

1 : constant

Therefore the F value (39,504) > F table (2,72) with Sig. (0,000) < 0,05. This means that the variables

of physical workload, mental workload and work stress have a significant effect on work stress.

#### t Test

The T test is used to test the independent variable towards the dependent variable partially (individually) (Ghozali, 2013). If the indicator is  $t_{Hitung} > t_{tabel}$  or significance (r) < 0,05 and Sig. F <  $\alpha$  0,005, so  $H_0$  is rejected or the independent variable simultaneously has a significant effect on the dependent variable.

**Table 9. t Test of Data Structure 1**

Coefficientsa						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	16.309	1.464		11.139	,000
	Physical Workload	,282	,115	,262	2.456	,016
	Mental Workload	,403	,093	,462	4.319	,000
a. Dependent Variable: Work Stress						

Source : Processed Data, 2019

It resulted on the t table at the 5% significance level (2-tailed) with the following equation:

$$\begin{aligned}
 t \text{ table} &= n - k - 1 ; \alpha/2 \\
 &= 80 - 2 - 1 ; 0,05/2 \\
 &= 77 ; 0,025 \\
 &= 1,991
 \end{aligned}$$

Note

n : total sample

k : number of independent variables

1 : constant

Therefore the it is found that:

Physical workload resulted in tvalue (2,456) >  $t_{table}$  (1,991) or significance (0,016) < 0,05. This means that physical workload affects work stress.

Mental workload resulted in tvalue(4,319) >  $t_{table}$ (1,991) or significance (0,000) < 0,05. This means that mental workload affects work stress.

From table 9 above, the equation of structural 1 is obtained as follows:

$$\begin{aligned}
 Y_1 &= \rho_{y1x1}X_1 + \rho_{y1x2}X_2 + \rho_{y1\epsilon1} \\
 Y_1 &= 0,262X_1 + 0,462X_2 + 0,759\epsilon_1
 \end{aligned}$$

The meaning of the structural equation above is:

The coefficient value of the physical workload variable obtained is 0.262. This means that each increase in physical workload by 1 unit will increase work stress by 0.262 and vice versa, assuming other variables remain the same.

The coefficient value of mental workload variable is 0.462. This means that 1 unit of each mental workload will increase work stress by 0.462 and vice versa, assuming other variables remain the same.

Standard error ( $\epsilon_1$ ) is 0.759. This means that the error path coefficient for other variables outside the study that affects work stress as much as 0.759.

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	<b>GIF (Australia) = 0.564</b>	<b>ESJI (KZ) = 8.771</b>	<b>IBI (India) = 4.260</b>
	<b>JIF = 1.500</b>	<b>SJIF (Morocco) = 7.184</b>	<b>OAJI (USA) = 0.350</b>

**Table 10. t Test of Data Structure 2**

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	27.625	1.449		19.059	,000
	Physical Workload	-,250	,073	-,315	-3.417	,001
	Mental Workload	-,226	,064	-,351	-3.551	,001
	Work Stress	-,186	,070	-,252	-2.671	,009

a. Dependent Variable: Performance

Source : Processed Data, 2019

It resulted on the t table at the 5% significance level (2-tailed) with the following equation:

$$t \text{ table} = n - k - 1; \alpha/2$$

$$= 80 - 3 - 1; 0,05/2$$

$$= 76; 0,025$$

$$= 1,992$$

Note

n : total sample

k : number of independent variables

1 : constant

Therefore the it is found that:

Physical workload resulted in t value (3,417) > t table (1,992) or significance (0,001) < 0,05. This means that physical workload affects performance.

Mental workload resulted in t value(3,551) > t table(1,992) or significance (0,001) < 0,05. This means that mental workload affects performance.

Working discipline resulted in t value (2,671) > t table (1,983) or significance (0,009) < 0,05. This means that work stress affects performance.

$$Y_2 = \beta_1 X_1 + \beta_2 X_2 + \beta_3 Y_1 + \beta_4 \epsilon_2$$

$$Y_2 = 0,315X_1 + 0,351X_2 + 0,252Y_1 + 0,625\epsilon_2$$

The meaning of the structural equation above is:

The coefficient value of the physical workload variable obtained is 0.315. This means that each increase in physical workload by 1 unit will increase performance by 0.315 and vice versa, assuming other variables remain the same.

The coefficient value of mental workload variable is 0.351. This means that each increase in mental workload by 1 unit will increase performance by 0.351 and vice versa, assuming other variables remain the same.

The coefficient value of mental work stress variable is 0.252. This means that each increase in work stress by 1 unit will increase performance by 0.252 and vice versa, assuming other variables remain the same.

Standard error ( $\epsilon_2$ ) is 0.625. This means that the error path coefficient for other variables outside the study that affects performance as much as 0.625.

**Coefficient of Determination (R<sup>2</sup>)**

R value or R<sup>2</sup> can be seen in this following table:

**Table 11. Coefficient of Determination Test Results of Structure 1**

Model Summary <sup>b</sup>				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,652 <sup>a</sup>	,424	,410	3.059

a. Predictors: (Constant), Mental Workload, Physical Workload  
b. Dependent Variable: Work Stress

Source : Data Processing, 2019

The calculation of the coefficient of determination (KD) was done using the following formula:

$$KD = R \text{ Square} \times 100\%$$

$$KD = 0,424 \times 100\%$$

$$KD = 42,4\%$$

This means that the effect of physical workload and mental workload on work stress simultaneously is 42.4%, while the remaining 57.6% can be influenced by other variables not included in this model.

**Table 12. Coefficient of Determination Test Results of Structure 2**

Model Summary <sup>b</sup>				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,781 <sup>a</sup>	,609	,594	1.874

a. Predictors: (Constant), Work Stress, Physical Workload, Mental Workload  
b. Dependent Variable: Performance

Source : Data Processing, 2019

**Impact Factor:**

<b>ISRA (India)</b> = 6.317	<b>SIS (USA)</b> = 0.912	<b>ICV (Poland)</b> = 6.630
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<b>GIF (Australia)</b> = 0.564	<b>ESJI (KZ)</b> = 8.771	<b>IBI (India)</b> = 4.260
<b>JIF</b> = 1.500	<b>SJIF (Morocco)</b> = 7.184	<b>OAJI (USA)</b> = 0.350

R Square = 0.609 This is used to see how much the influence obtained by the coefficient of determination of path 2 of 0.609. This means that the effect of physical workload, mental workload and work stress towards work stress is 60.9%, while the remaining 39.1% is influenced by other variables that are not included in this model.

**Path Analysis**

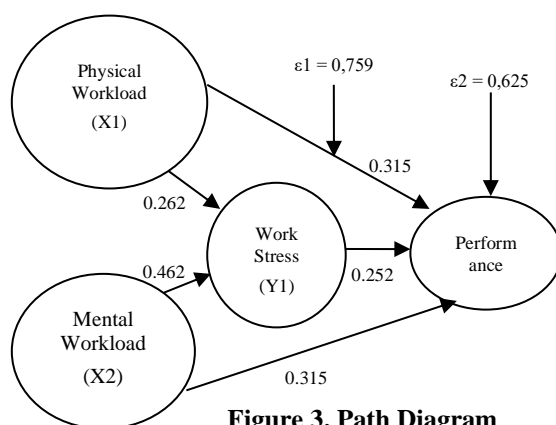
Based on the processed data, it can be calculated that the relationship between the direct and indirect impact of physical workload and mental workload variables on performance through work stress can be seen in the table below:

**Table 13. Summary of Model Parameter Estimates**

Impact	Relation		Total	Note
	Direct	Indirect		
Physical workload → Work stress	0.262	-	0.262	Moderate
Mental workload → Work stress	0.462	-	0.462	Strong
Physical workloads → Performance	0.315	0,262 x 0,252 = 0,066	0.381	Strong
Mental workloads → Performance	0.351	0,462 x 0,252 = 0,116	0.467	Strong
Work stress → Performance	0.252	-	0.252	Moderate

Source: Processed Data, 2019

From the result, a figure of structural model of the study can be drawn as follows:



**Figure 3. Path Diagram**

Source: Processed Data, 2019

$$\epsilon_1 = \sqrt{1 - R^2} = \sqrt{1 - 0,424} = 0,759$$

$$\epsilon_2 = \sqrt{1 - R^2} = \sqrt{1 - 0,609} = 0,625$$

**Discussion**

**The Effect of Physical workload towards Work stress**

Based on the research that has been done, it is known that the physical workload variable gives a positive and significant effect on work stress. This is because excessive workload on nurses can lead to work stress. Nurses who experience work stress allow them to be unable to perform effectively and efficiently because their physical and cognitive abilities are reduced.

**The Effect of Mental Workload towards Work stress**

Based on the research that has been done, it is known that the mental workload variable gives a positive and significant effect on work stress. This is because mental workload can emerge from an increase in the number of patients along with an increase in the demands of nurses' duties in the form of mental workloads. The increasing workload experienced by nurses due to the demands of professionalism implicate the nurses in the emergence of psychological pressures in the form of work stress caused by mental workloads.

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### The Effect of Physical workload towards Performance

Based on the research that has been done, it is known that the physical workload variable gives a positive and significant effect on performance. This is because workload is an individual extrinsic factor which becomes one of the sources of performance problems, because the workload a person is facing is too high. This condition requires nurses to provide more energy than usual in completing their work, not all nurses have the same level of resistance to pressure from the workload, but all of this depends on each individual. It means that whether these tasks will be completed properly or not depends on how one thinks the workload he experiences.

### The Effect of Mental Workload towards Performance

Based on the research that has been done, it is known that the mental workload variable gives a positive and significant effect on performance. This is because when the mental workload continues to increase, the nurse's performance will decrease. Mental workload is an element that must be considered by a workforce to make a harmony and high work productivity.

### The Effect of Work Stress towards Performance

Based on the research that has been done, it is known that the work stress variable gives a positive and significant effect on performance. This is because nurses who experience stress will have difficulty concentrating on work. The poor performance of nurses is influenced by various factors, one of which affects the performance of nurses is work stress experienced by nurses. High level of work stress can reduce the quality of nursing care. The decline in the quality of nursing care occurs because the work system is not supportive and the workload is too heavy, which then cause work stress.

### The Effect of Physical workload through Work stress

Based on the research that has been done, it is known that the physical workload variable gives a positive and significant effect on work stress. This is because inappropriate physical workload will make nurses to experience work stress and this condition is

eventually carried away at work, thereby reducing the quality of the nurse's work.

### The Effect of Mental Workload through Work stress

Based on the research that has been done, it is known that the mental workload variable gives a positive and significant effect on work stress. This is because the mental workload will cause work stress which in turn gives an impact on reducing the performance of nurses. The mental workload of hospital nurses can be in the form of the presence of various types of patients and illnesses, time pressure in making fast and correct decisions to take action on patients and having to face panicked patient families.

## Conclusions And Suggestions

### Conclusions

Based on the descriptive results, it can be seen that the performance of nurses is not yet good, especially in the indicators of providing health education about how to care for patients to the patient's family.

Job stress gives significant effects on performance. The lowest value is found on the indicators of experiencing emotional changes (unstable emotions).

Physical workload gives significant effects on performance. The lowest value is on the indicator of breathing and a faster heart rate while working.

Mental workload gives significant effects on performance. The lowest score is the indicator of often feeling frustrated when doing work during working hours.

### Suggestions

The hospital is expected to be able to educate nurses on how to provide clear information to the patient's family.

The hospital is expected to provide emotional control training for nurses.

Nurses are expected to be able to take rest first when their breathing and heart rate are faster while working and the hospital is expected to not place too much burden on nurses beyond the their capacity.

In order to create good mental health, the hospital can provide comfort by creating a comfortable work space for nurses.

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## THE EFFECT OF FOREIGN FUND FLOW AND TRANSACTION ACTIVITY ON THE VOLATILITY AND PERFORMANCE OF THE INDONESIAN CAPITAL MARKET

**Abstract:** This study aims to analyze the direct and indirect effects of net foreign and transaction activities on the volatility and performance of the capital market. The study was conducted on the Indonesia Stock Exchange with the research sample of historical data for the 2009-2018 periods which was officially requested to the Indonesia Stock Exchange. Those data were analyzed using Path Analysis with the Partial Least Square (PLS) method. The results showed that foreign fund flow directly had a significant positive effect on capital market performance. Meanwhile, stock price volatility had a significant negative effect on capital market performance. Indirectly, volatility positively and significantly mediated the relationship between foreign fund flow and capital market performance. Furthermore, any significant results could not be found in the transaction activity variable, either a direct or indirect relationship with the performance of the capital variable. Volatile market conditions needed attention since they tended to harm investment returns. The magnitude of the dominance of foreign ownership of funds in the capital market tended to have an impact on the high dependence of capital market fluctuations and stock performance on foreign investor activities. However, the high level of foreign funds entering the market and the high level of volatility pushed stock returns to be more optimal for investors. The feasibility of the research model was indicated by the Q-Square value for stock price volatility of 0.117 and the capital market performance of 0.144 indicating that the predictive relevance of this research model was very good.

**Key words:** Foreign fund flow, Transaction Activity, Volatility, Capital Market Performance.

**Language:** English

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### Introduction

The capital market is an instrument used to enhance a country's economy and is a means of investment for the community. In terms of economy, the capital market provides long-term access to funding for companies that need funds for business development. Meanwhile, in terms of the community, the capital market acts as an intermediary for them to be able to invest their funds in these companies. It is expected that the flow of investment funds from the public through the capital market might help the growth and development of a company's business. Thus, this will also encourage economic growth and development in a country.

The public or investors who invest through the capital market are not only domestic investors but also investors from abroad (foreign). Access is allowed for foreign investors to participate in investing in the country due to the limited funds that might be absorbed from domestic investors to meet the demands of companies listed on the capital market. Meanwhile, the provision of investment access for foreign investors might cause the flow of foreign funds to the capital market to be unlimited.

The capital market is a very liquid investment instrument where investors can bring in and out their funds quickly. Thus, it will affect the formation of share prices in the market. The existing studies on volatility and stock price formation only examined the fundamental factors which might provide an answer to be a phenomenon of long-term investment decisions. Fluctuations in stock price movements that occur in a relatively fast time reflect the existence of investors' behaviors that are not only oriented towards long-term but also short-term investments. Additionally, the flow of foreign funds out of the capital market also caused a decrease in the share of foreign investors' ownership of funds in the Indonesian capital market.

The outflow of foreign funds needs to be seen in its effect on the volatility and performance of the capital market to find out how much risk and capital market performance is affected by foreign investors. Thus, an empirical investigation was conducted in this study by answering the following key questions:

- Do foreign fund flow and transaction activity directly affect the volatility and performance of the capital market?
- Do foreign fund flow and transaction activity have an indirect effect on capital market performance through volatility?

These questions have repeatedly attracted the interest of investors, economists, and policymakers, and are asked with greater urgency during times of financial turmoil or changes in the distribution of capital flows. The answers to the above questions often leave a negative impression on foreign investors. Accordingly, there is an argument that foreign fund flow causes an overreaction to prices and might spread

to other things. Whereas in an efficient market, it is known that capital flow is only one of the processes by which information is included in an asset price.

### Theoretical Review

#### Volatility

Volatility in financial markets describes the fluctuation in the value of an instrument over a certain period. In statistics, volatility is defined as the change in the value of the fluctuation against the average of a financial time series. The existence of volatility might increase the risk and uncertainty faced by market players. Thus, market players' interest in investing becomes unstable. One of the ten principles of financial management states that investors will not want to take a higher risk unless they can get compensation in the form of a higher return (high risk, high return) (Known, 2003). Moreover, the existence of volatility also has an impact on the existence of global financial markets since it is related to the idea of risk.

A way to measure volatility is to use a standard deviation, which describes how closely the price of a stock can be grouped around its mean or moving average. In a tight market, the standard deviation is very low. Meanwhile, in the loose market, the standard deviation will be relatively high.

The types of volatility often observed in the stock market are stock price volatility and stock return volatility. Stock price volatility describes changes in the closing price of a stock or a stock index that occurs during a certain period of observation. Changing stock closing prices can occur due to internal and external factors (Ajireswara, 2014). Internal factors that cause fluctuations in closing prices are related to the issuers of the shares concerned, for example, a change in the company's profit rate. Furthermore, it is also seen from the external factors that occur, such as shocks that occur on the foreign stock market, macroeconomic factors such as exchange rates and interest rates, as well as the existence of issues developing in the stock market itself. The volatility of stock prices is very important to observe for investors, for it is the basis for calculating the volatility of stock returns. The volatility of stock returns describes the fluctuation in the difference in daily observed prices within a certain observation period.

According to Schwert and W. Smith, Jr (1992), there are five (5) kinds of volatility in financial markets, namely:

#### 1) Future Volatility

Future Volatility is what traders in financial markets want to know.

#### 2) Historical Volatility

To know the future, it is necessary to study the past. This is done by making modeling with pricing theory based on previous data to predict future volatility.

#### 3) Forecast Volatility

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Just as there are services that attempt to predict the future direction of the price of a contract, there are services that attempt to predict the future volatility of a contract.

#### 4) Implied Volatility

Implied volatility is the volatility that should be included in the theoretical pricing model to produce a theoretical value identical to the option price in the market.

#### 5) Seasonal Volatility

Certain agricultural commodities, such as corn, beans, soybeans, and wheat, are very sensitive to volatility factors that arise from bad season weather conditions.

One of the fluctuations in the value of an instrument in the stock market can be caused by the influence of irrational factors that affect the demand and supply of a market (Maskur, 2009). This irrational factor can be in the form of rumors that are developing in a market, following dreams or what others say, or the existence of price games. An efficient market is a stable market, which fluctuates due to irrational actions, is removed. Measurement of stock price volatility is useful for showing whether the asset is excessive movement of irrational market players, in which speculators and investors' frenzy (emotional) regulate or influence share prices. Thus, the movement of shares does not occur due to fundamental reasons. High and continuous volatility in a market indicates that the stock market is influenced by speculators and investor frenzy.

### Foreign Investment

Investment in essence is the placement of several funds at this moment to obtain profits in the future. In general, investment is divided into two, namely financial asset investment and real assets investment. Financial asset investment is carried out in the money market, for example in the form of certificates of deposit, commercial paper, money market securities, and others. Investment can also be made in the capital market, for example in the form of stocks, bonds, warrants, options, and others. Meanwhile, investment in real assets can be in the form of purchasing productive assets, establishing factories, opening mining, opening plantations, and others (Halim, 2005).

From origin or source of investment, the investment can be divided into domestic investment and foreign investment. Foreign investment that enters a country can also be in the form of investment in financial assets (portfolios) and investment in real assets (foreign direct investment). Foreign Direct Investment is an investment in assets or factors of production to conduct business. For example, investment in plantations, fisheries, factories, shops, and other types of business. In general, in everyday

speech, this kind of investment is also called investment in real assets, or investment that is clear and easy to see. Besides, this direct investment generates a large multiplier effect on the wider community. This direct investment also has a backward impact, in the form of business input, and the future, in the form of business output that is an input for other businesses. Meanwhile, foreign nondirect investment is an investment in financial assets, not in assets or production factors. Examples of non-direct investment include deposits, investment in securities, such as stocks and bonds, commercial paper, mutual funds, and so on. Investments in these financial assets are also intended to obtain future benefits. The future benefits of this investment are better known as investment returns, or to simplify it is called interest.

### Risk and Return Theory

Home and Wachoviz (1998) define return as "benefit which related with the owner that includes cash dividend last year which is paid together with market cost appreciation or capital gain which is a realization at the end of the year". According to Jones (2000), "Return is yield and capital gain (loss)". Yield is cash flow paid periodically to investment holders. Meanwhile, capital gain (loss) is the difference between the price of an investment at the time of purchase and the price at the time of sale. Based on the above definitions, it can be concluded that return is the gain (loss) obtained from the amount of cash flow (dividend) when holding an investment with the gain (loss) obtained when selling the investment. In selecting and evaluating investment instruments in the future, every investor will face uncertainty for a return that will be obtained is not something that is truly certain. Many factors play a role behind it all. Therefore, investors will pay attention to the expected return of the investment that will be made in the future. The return from an investment is influenced by both internal and external factors. Internal factors that come from within the company, if in bond investment such as company performance, the risk of default are the company. Meanwhile, external factors come from outside the company or matters related to macroeconomic conditions.

According to Reily (2000), "risk is the uncertainty that investment will earn its expected rate of return". Risk is the uncertainty of an investment that will be obtained with the expected return. Keown (2005) defines "risk as the likely variability associated with expected revenue or income streams". Risk is the possibility of the variability of the resulting returns. Based on the above understanding, it can be concluded that risk is the deviation that occurs between factual return and expected return.

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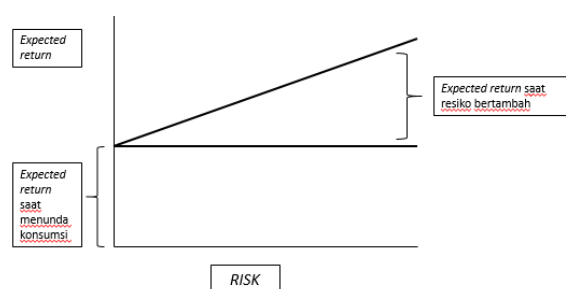


Figure 1. Risk-Return Theory

Figure 1 visualizes that risk and return have a direct and linear relationship. According to Keown (2005), ten principles underlie the learning of financial management. The first of these ten principles is “The Risk-Return Theory: We won’t take on additional risk unless we expect to be compensated with additional return”.

This principle explains that the expected rate of return reflects the level of risk of the investment concerned whether a form of investment has a higher risk or vice versa. In selecting an investment instrument, investors will look for instruments that can compensate for their risk that exists in the investment instrument. Risks can be divided into two types:

1. Systematic risk is the risk that cannot be avoided through diversification or the formation of a portfolio of some assets. This risk is related to general market conditions, for example, changes in the macroeconomy, interest rate risk, political risk, inflation risk, exchange rate risk, and market risk.

2. Unsystematic risk can be avoided or minimized by diversifying the formation of a portfolio of several assets.

### Financial Behavior Theory

At first, investors did not only use estimates of the prospect of investment instruments in investing but also psychological factors determined the investment. Various parties stated that this investor psychology factor has the greatest role in investing. One interesting example is the presence of bounded rationality in investing. An example of this bounded rationale is that investors always invest irrationally, for example, an investment manager offers an investment with a return rate of 12% per year and a friend of an investor offers the same investment with a return rate of 11% per year and the investor chooses an investment offered by the investment manager than the one offered by his friend. On the other hand, investors sell their shares as soon as possible if they appear to be profitable and hold the shares for a very long time when the stock price drops (Shefrin, 1981). This case shows that investors do not want to experience losses on their investment. Shares that have dropped are not sold until the shares rebound to

get a little profit and then sell them. Various investment textbooks state that stocks are a long term investment. There has even been a study that states that holding shares in the long term is the same as trading the stock in the same period as holding the stock in the long term.

The existence of these psychological factors affects investment and the results to be achieved. Therefore, investment analysis that uses psychology and financial science is known as behavioral finance. Shefrin (2000) defines behavioral finance as a study that studies how psychological phenomena affect financial behavior. The behavior of the stock players is where Shefrin (2000) states the level of behavior of the practitioners. Nofsinger (2001) defines behavioral finance as a study of how humans behave in a financial setting. In particular, it is a study of how psychology affects financial, corporate, and financial market decisions. The two concepts described clearly state that behavioral finance is an approach that explains how humans invest or deal with finance is influenced by psychological factors.

This financial behavior began to be known by various parties, especially academics after Solvic (1969 and 1972) put forward the psychological aspects of investing and the stockbroker. Tversky and Kahneman (1974) suggested an assessment of uncertain conditions that could produce heuristics or bias. Kahneman and Tversky (1979) also suggested prospect theory followed by in 1992 on advanced prospect theory Thaler (1981) suggested on mental accounting; Shefrin (1981, 2000) published various papers on the development of financial behavior and a book entitled *Beyond Greed and Fear*. Bondt (1998) describes the portrait of an individual investor while Statman (1995), Golberg and Nitzsch (1999), and Forbes (2009) describe behavioral finance.

### Portfolio Investment Theory

Based on United Nations Conference on Trade and Development (UNCTAD, 1999), portfolio investment involves the transfer of financial assets utilizing investments made by residents through individuals, companies, or institutions in one country in the securities of another country, either directly in the form of corporate assets or indirectly through

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financial markets. The main objective of investors to invest in portfolios is to get benefits in the form of capital gains and to reduce the risk of portfolios held by investors by diversifying internationally.

Sunariyah (2006) argues that a portfolio is a series of combinations of several invested assets. Portfolio theory is a theory that analyzes how to choose a combination of assets based on the risk of wealth types, both in the form of physical assets and securities. The higher the risk of an investment, the higher the level of profit obtained.

Foreign portfolio investment can also be referred to as a short-term investment. In international capital flows, this portfolio investment takes the form of investing in financial assets, such as stocks and bonds. The type of investment consists of controlling shares that can be transferred to several countries.

The issuance of shares is intended to fulfill or obtain funds for the continuity of a company's business. Companies can expand their business scale by providing capital obtained through buying shares fulfilled by investors. Corporate investors are in a large scope than individual investors, but they perform the same function. Investors buy and manage assets for profit.

According to Mishkin (2008), the factors that influence someone to buy an asset are as follows:

1. Wealth influences since if a person's wealth increases, he will have more resources to buy assets.
2. Expected Return is expected results obtained by holding the asset.
3. Risk is a degree of uncertainty associated with an asset relative to other assets.
4. Liquidity is how quickly and easily an asset is converted into cash.

Therefore, all the actions of a person conducted in holding an asset, related to the purpose of investing, will be based on the four factors mentioned above. Whereas an asset is something possessed which is a deposit of wealth or value in the form of a stock asset.

### Market Efficiency Theory

According to Bodie (2005), the efficient market hypothesis is when the stock price reflects all available information. Fama (1978) defines Efficient Market Hypothesis (EMH) as a theory that explains how the price of a market is formed due to new information responded to by investors and can be categorized into three, namely:

a. The efficient market hypothesis is weak when the stock price reflects all the information available in the market such as historical prices, trading volume, and short-term interest rates.

b. An efficient market hypothesis is a semi-strong form when all publicly available data relating to the firm's prospects should already be reflected in market prices. The data in question is the weak version of the data used plus the company's fundamental data,

management quality, earnings predictions, and company balance sheet information.

The efficient market hypothesis forms a strong one when all the information related to the firm, whether published or unpublished, should already be reflected in the market price. This kind of market is what investors expect to get the expected profit.

### Hypothesis

Following the background of the study, problem formulation, research objectives, theoretical review, and framework, hypothesis testing can be formulated as follows:

*H1: Foreign Fund Flow affects Capital Market Performance*

*H2: Transaction activity affects the Performance of the Capital Market.*

*H3: Stock Price Volatility affects Capital Market Performance*

*H4: Volatility of share prices mediates the relationship between Net Foreign Fund Flow and Capital Market Performance*

*H5: The volatility of share prices mediates the relationship between Transaction activity and Capital Market Performance*

### Research Method

#### Types And Sources Of Data

The data used in this study were secondary data related to the variables studied. Secondary data is data collected indirectly from the source. Secondary data has usually been collected by data collection agencies and published to the data user community. The data are quantitative in the form of numbers which are then processed and interpreted to obtain meaning from the data. This study employed historical data taken during the 2009-2018 period. The data were obtained from the Indonesia Stock Exchange through its site [www.idx.co.id](http://www.idx.co.id).

#### Data Collection Method

The data collection method utilized in this study was the documentation method, namely by collecting, recording, and reviewing secondary data published through the official website of the Indonesia Stock Exchange and data specifically requested by the Indonesian Stock Exchange authorities. The data collected were the flow of foreign fund transactions in the capital market, the number of transactions, and the movement of the IDX Composite value obtained by direct quoting or processed from the Indonesia Stock Exchange.

#### Operational Definition of Variables and Measurement

The dependent variable used in this study was the capital market performance. Capital market performance was measured through the rate of return on the Indonesia Composite Index (IDX Composite).

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Indonesia Composite Index is a type of index that uses all shares of issuers listed on the IDX. According to Jogyanto (2015), stock index return can be calculated by the following formula:

$$R_t = \frac{Index_t - Index_{t-1}}{Index_{t-1}}$$

Description:

$R_t$  = IDX Composite Return on the t-day

$Index_t$  = IDX Composite on the t-day

$Index_{t-1}$  = IDX Composite price on the previous day (t-1)

Independent variables in this study were the Net Flow of Foreign Fund (X1) and Transaction Activity(X2).

#### 1. Net Flow of Foreign Fund (*Net Foreign*)

Net foreign is the net transaction value made by the foreign investor. If a purchase transaction conducted by a foreign investor is greater than the selling transaction, it means that a net inflow of foreign transactions made by the foreign investor is smaller than the value of the sale transaction. Thus, there will be a net outflow of foreign funds, known as Net Sell. The value of the net foreign can be formulated as follows:

Net Foreign = Total Foreign Buy – Total Foreign Sell

#### 2. Transaction Activity

Transaction activity is measured by looking at the number of transaction frequencies in a period that occurs on the Indonesian stock exchange. This number of frequencies is obtained by taking detailed trade data on the Indonesia Stock Exchange. Mathematically, the amount of transaction activity can be calculated by the following formula: Transaction Activity = Total Freq. Stock Transaction by Investors' F+D (**sell+buy**)

This study was mediated by the volatility of stock prices which was an indicator for measuring investment risk. The volatility of stock prices in this study was included in the historical volatility type since the researchers used historical data regarding the IDX composite from the 2009-2018 period. Mathematically, historical volatility can be calculated using the following formula (Parkinson, 1980):

$$\sigma_{PV} = \sqrt{\frac{1}{n} \sum \ln \left( \frac{Hi}{Li} \right)^2}$$

**Description:**

$\sigma_{PV}$  = High-Low Volatility Estimator

ln = Natural logarithm

n = Number of observations

Hi = Monthly High Price

Li = Monthly Low Price

#### Data Analysis Method

Descriptive analysis was carried out to obtain an empirical description or descriptive of the data collected in the study. The data were processed by grouping, tabulating, processing to obtain descriptive data including average, maximum, and minimum values, and then given an explanation.

Inferential statistics (inductive statistics or probability statistics) are data analysis techniques used to determine the extent to which the results obtained from a sample are similar to the results obtained in the population as a whole. Under the formulated hypothesis of the study, inferential statistical data analysis was measured using the Warp-PLST (Partial Least Square) software starting from the measurement model (outer model), the structure model (inner model), and the hypothesis testing. PLS assumes that the research data is distribution-free, meaning that the research data does not refer to one particular distribution (for example, the normal distribution). PLS is an alternative method of SEM that might be used to solve the problem of relationships between complex variables. However, the data sample size of PLS is small (30 to 100), considering that SEM has a minimum data sample size of 100.

#### Findings And Discussion

##### Structural Model

Before analyzing the data, the empirical research model was tested or evaluated in advance. The results of testing or evaluating the structural model in this study obtained the results of the path diagram visualized in Figure 2 below:

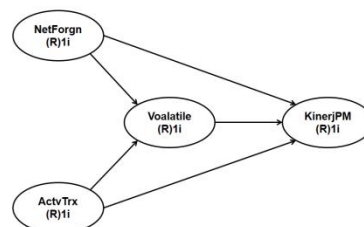


Figure 2. Research model

#### Evaluation of Structural Model Goodness of Fit (Outer Model)

The structural model in PLS was evaluated using the coefficient of determination ( $R^2$ ) and the Q-squared

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value. Table 1 below presents in detail the results of the structural model evaluation.

**Table 1. Coefficient of Latent Variables**

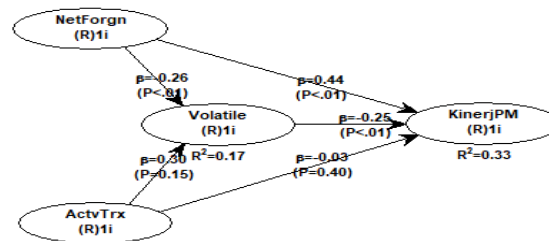
Coefficient	CM Performance	NetForgn	ActvTrx	Volatile
Full Collinearity VIFs	1.349	1.363	1.075	1.09
R <sup>2</sup>	0.147			0.16
Q-Squared	0.144			0.11

The coefficient of determination (R<sup>2</sup>) shows the percentage of variance in endogenous constructs that can be explained by exogenous constructs. The higher the coefficient of determination (R<sup>2</sup>) indicates the better the prediction model of the proposed research model (SholihinandRatmono, 2013). Table 1 above shows that the endogenous construct of stock price volatility (Volatile) had a coefficient of determination (R<sup>2</sup>) of 0.166. Indicates that the variance of the endogenous variable of stock price volatility can be explained by 16.6% by the variance of exogenous variables, net foreign (NetForgn), and transaction activity (ActvTrx). Meanwhile, the endogenous construct of capital market performance (CM Performance) had a coefficient of determination (R<sup>2</sup>) of 0.147 indicating that the construct can only be explained by an exogenous construct of 14.7% 14.7% which means very weak.

Meanwhile, to see predictive relevance, researchers employed the Q-Squared value. This value should be greater than zero to indicate that the exogenous latent variable has predictive relevance to the affected endogenous latent variable (SholihinandRatmono, 2013). The Q-Squared value shown in the table above was 0.117 for stock price volatility and 0.144 for capital market performance, indicating that the predictive relevance of this research model was very good.

### Hypothesis Testing and Research Discussion

The hypotheses in this study were tested using a structural equation model with the partial least square method (SEM-PLS). The following figure presents the results of the evaluation of the proposed research model.



**Figure 3. Result of Research Model Evaluation**

There were five hypotheses proposed in this study. The support of the research hypothesis was determined by looking at the path coefficient values,

standard errors, P-values, and effect sizes of the results of the analysis. Details of the results of hypothesis testing can be seen in the following table:

**Table 2. Path Coefficients, P-Values, Standard Errors, and Effect size**

No	Variabel	Koefisien Jalur	P-Values	Standard errors	Effect Size
1	NetForgn → Volatile	-0.263	0.005*	0.100	0.072
2	ActvTrx → Volatile	0.302	0.153	0.294	0.094
3	NetForgn → KinerjaPM	0.476	≤0.001***		
4	ActvTrx → KinerjaPM	-0.156	0.089		
5	Volatile → KinerjaPM	-0.384	≤0.001***	0.110	0.147
6	NetForgn → Volatile → KinerjaPM	0.101	0.034*	0.055	0.053
7	ActvTrx → Volatile → KinerjaPM	-0.116	0.181	0.127	0.019

\* Signifikan pada level 0.05 (2-tailed)  
 \*\* Signifikan pada level 0.01 (2-tailed)  
 \*\*\* Signifikan pada level 0.001 (2-tailed)

Based on the details of the table, several research results were found as follows:

1. Directly, net foreign had a positive and significant relationship to capital market performance (CM Performance). This is indicated by the path

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coefficient value of 0.476 and the p-value of  $<0.001$  (less than 0.05). This result is in line with previous studies including a study by Adaoglu and Salih (2013) which found a causal relationship between foreign fund flow and the rate of return on the EU capital market. Seen and compared with the data on the composition of capital ownership in the Indonesia stock exchange dominated by foreign investors, the statistical results of this path analysis support the previous descriptive analysis. Along with the large composition of their own in the Indonesian capital market, foreign investors tend to be more careful in choosing which stocks to choose for their investment portfolios and will be oriented in the long term. Investing in the short term will only increase the volatility of the market and this is unlikely to provide a large return for long-term investors.

2. Furthermore, it was found that the transaction activity variable had a negative and insignificant relationship with the capital market performance variable, as indicated by the path coefficient value of  $-0.156$  and p-value of  $0.089$ . Similar results are found in a study conducted by Sana, Hsieh Hui-Ching (2014) which stated that the transaction volume cannot directly explain the effect on stock returns. High transaction activity reflects the behavior of investors who make transactions in the short term, which can be in the time frame of minutes, hours, days, and weeks. This kind of market participants is known to have a desire to get relatively high profits. Thus, they will choose a strategy on how to get profit by getting a thin spread/difference in selling and buying prices but with a large number of transaction frequencies. Therefore, even though they only invest in the short term, accumulated within 1 month the rate of return obtained might be relatively large. This condition, trader's behavior, could not be measured using the operational method of the capital market performance variables in MoM as used in this study. Thus, in the future, it is expected that there will be research that can explain the behavior of traders to obtain more relevant results in explaining the relationship between transaction activity and capital market performance.

3. The volatility variable of stock prices had a negative and significant relationship to the performance of the capital market with a path coefficient of  $-0.384$  and a p-value of  $<0.001$  (less than 0.05). The effect size values was  $0.147$  classified as moderate according to the opinion of Sholihin and Ratmono (2013). The negative relationship that occurs between stock price volatility and the performance of the capital market in Indonesia reflects that the Indonesian market is still in a developing stage. This means that investors with a short-term (daily) orientation still dominate and cause high volatility in the market. As the results of a study conducted by Richard, A. Michelfelder, and Saurin Pandya (2005) found that emerging markets have higher volatility but have lower shock

persistence than mature markets. Thus, this has an impact on a higher daily rate of return on developing countries. These results also indicate a similarity between market conditions in Indonesia and other developing countries as well such as India, where global factors tend to have a similar impact on the level of volatility and stock returns in these two countries.

4. Meanwhile, the indirect relationship between net foreign fund flow and capital market performance mediated by stock price volatility showed a positive and significant relationship. This is indicated by the path coefficient value of  $0.101$  and the p-value of  $0.034$ . Meanwhile, the effect size of  $0.053$  was considered weak. It can be interpreted that the volatility of share prices mediated the indirect relationship between net foreign and capital market performance. Foreign investors who have a long-term investment orientation might make decisions based on considerations of future business fundamental factors compared to technical factors, the momentum of stock movements. However, the high stock price volatility provides opportunities for foreign investors to enter and exit the market easily to provide a more optimal investment return. Foreign investors can easily buy shares at a low price and sell their shares at a higher price due to the encouragement of high levels of market liquidity. This is possible if market liquidity occurs normally without a market maker. Normal market liquidity is driven by access to information easily accepted by investors, in line with technological advances in this digital era. On the other hand, the liquidity created by market makers is usually caused by conditions was not all investors have easy access to information. Thus, many investors make their investment decisions based on the decisions of other investors or go along with them. This phenomenon occurred before the digital era, where the means of information about the market came from print media such as newspapers and business magazines which reach was still quite limited.

5. Furthermore, the indirect relationship between transaction activities on capital market performance mediated by stock price volatility showed a negative and insignificant relationship. This is indicated by the path coefficient value of  $-0.116$  and the p-value of  $0.181$ . Meanwhile, the effect size was  $0.019$  considered weak. Thus, it can be concluded that volatility does not mediate the relationship between transaction activity and capital market performance.

## Conclusions And Suggestions

### Conclusion

This study is an empirical study to provide evidence about the impact of foreign fund flow and transaction activity that occur in the Indonesian capital market on the level of stock price volatility and capital market performance. The researchers developed a

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model using the SEM-PLS approach in testing the proposed hypotheses.

The results of the study found strong evidence of the influence of foreign fund flow as a factor that has a significant impact on capital market performance and stock price volatility. In a direct relationship, the amount of net foreign into the capital market has a positive impact on the performance of the capital market. On the other hand, the volatility of share prices has a negative response to this. Moreover, the volatility of stock prices itself has a direct negative effect on capital market performance. Meanwhile, if tested indirectly, the volatility of share prices weakly mediates the relationship between net foreign and capital market performance. This shows that the increasing number of foreign funds entering the capital market has an impact on increasing the share of ownership of funds and reducing the share of ownership of domestic investors. The character of foreign investors who tend to invest in the long term will reduce the volatility of stock price movements in the market. However, if the share of capital ownership is dominated by domestic investors, it will increase the volatility of share prices. This high volatility market condition is beneficial for foreign investors where the decision to enter the exit of the market will tend to be easier in a liquid market condition. Therefore, the returns will be more optimal. Meanwhile, the researchers did not find a significant effect of the transaction activity variable on volatility and capital market performance, either directly or indirectly. Thus, it can be concluded that the volatility of stock prices and the performance of the capital market in Indonesia is more influenced by foreign capital flows than by high transaction activity.

### Implications

Many researchers and students in the last few decades have been interested in conducting studies in the area of Investment Decision Making and Market Behavioral Finance. This should be given high appreciation because this study can add to the repertoire of knowledge and contribute to interested parties. The **theoretical implication** of this study is the finding of the relevance of the risk and return trade-off theory in the portrait of current capital market developments. Whereas volatile market conditions do not always provide high potential

returns in the long term, but also depend on the economic profile and capital market of a country. This is indicated by the diversity of research results in various countries regarding the relationship between foreign capital flows, transaction activity, and stock price volatility on capital market performance. The **practical implication** of this study is its benefits for market players, especially investors in making investment decisions. Several important things related to the practical implications of this study include the following:

1. Market conditions that are highly volatile need attention since they tend to harm investment returns.
2. Considering the factor of the amount of foreign fund flow into or out of the capital market can help investors in making investment decisions by knowing the right momentum to buy or sell stocks.
3. The magnitude of the dominance of foreign fund ownership in the capital market tends to increase the influence of foreign investor activity on fluctuation and rates of return in the capital market.
4. Volatile market conditions have a negative relationship with performance. However, if the flow of foreign funds into the market is high, it might encourage a more optimal level of return on investment.

### Limitations and Suggestions

Similar to other empirical studies, this study has several weaknesses and limitations. Among the limitations and suggestions of this study are:

First, this study was conducted only on the scope of the Indonesian capital market. Thus, the results of this study may only be generalized to countries that have the same economic profiles as Indonesia. Further studies are suggested to increase the sample to countries in Southeast Asia to get an overview of the research results in a broader scope. Second, The operationalization of the variables in this study used monthly historical data. Meanwhile, trading activities tend to be carried out by short-term investors (traders) with a daily time frame or less than 1 month. Therefore, further research is expected to use data with shorter time frames to obtain more relevant results in explaining the behavior of short-term investors or traders.

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## ANALYSIS OF PALM SUGAR SMES PRODUCTION FROM A SHARIA PERSPECTIVE IN ROKAN HULU REGENCY, RIAU PROVINCE IN 2020

**Abstract:** This study aims to determine and analyze the production of palm sugar in Small and Medium Enterprises (SMEs) in Rokan Hulu Regency, Riau Province, which had reached the Optimal Mashlahah. The execution of mashlahah in production activities is profit and blessing. Thus, producers might determine the combination of profit and blessing in realizing optimal mashlahah. The non-technical content of blessings is found in resources (inputs) and results (outputs), as well as in the production process.

This study employed a quantitative method with descriptive data analysis. The model used was a "Comparative Approach" with two forms of the production process, namely a production process containing  $\geq 95\%$  of sharia elements (optimal mashlahah) and a production process containing  $< 95\%$  of sharia elements (non-optimal mashlahah). The data analysis technique used in this study was the descriptive technique. The production analysis used quantitative analysis by examining aspects of resources (inputs), production processes, and results (outputs). These three aspects were analyzed based on physical attributes such as the manufacture of raw material for palm sap and the value considered beneficial for producers and consumers.

Based on the results of the study, it was found that the production of Palm Sugar in SMEs in Rokan Hulu Regency, Riau Province in 2020 still had not reached the Optimal Mashlahah. Based on the comparative approach, the palm sugar production process has a sharia value below 95%. Thus, it is still too far to reach  $\geq 95\%$ .

**Key words:** Production, SMEs, Mashlahah.

**Language:** English

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### Introduction

Production is a consumption chain that provides consumer needs for goods and services. Both

producers and consumers, in economic activity, have the objective of obtaining optimal mashlahah. Thus, producers in the perspective of Islamic Economics are

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not economic actors seeking optimal profits, but mashlahah hunters. The execution of mashlahah in production activities is profit and blessing. Therefore, producers will determine the combination of profit and blessing that can realize optimal mashlahah.

Production is part of economic activity, where the perpetrators are called producers. The word production is implied in the Word of Allah SWT, the Qur'an Surah Luqman [31:20]: "Do you not see that Allah has made subject to you whatever is in the heavens and whatever is in the earth and amply bestowed upon you His favors, (both) apparent and unapparent?"

All that is in the heavens and on earth is provided by Allah SWT, as an input or factor of production (resource). The production process is carried out on this resource to produce outputs (goods and services). Output is utilized for the needs of mankind. Therefore, mankind can use it optimally, with the intention that it can be enjoyed both physically and mentally, materially and spiritually. In another sense, production is intended to create and add mashlahah, not just to create and add material. The fulfillment of human needs, not only the fulfillment of physical material needs but also the fulfillment of abstract material needs, in this case, the fulfillment of needs related to the relationship with the Creator, Allah Azza Wajjallah (hablumminallah). According to P3EI (2009: 259), the objectives in realizing the optimal mashlahah of the producers are (1) to earn profits, (2) in terms of resources that have a technical relationship with output, and (3) consideration of the content of blessings that are nontechnical in the resources (inputs) and results (outputs).

Qardawi (1997:31) defines Islamic economics as an economy based on God. This system is sourced from Allah, and the ultimate goal is to Allah by using means that cannot be separated from the Sharia of Allah SWT. Economic activities such as production, consumption, import, and export cannot be separated from the point of departure from God and the ultimate goal is to God. This final goal, which is only focused on production activities in the form of profit and blessing.

Currently, the Indonesian economy is developing quite rapidly. This is marked by the number of new businesses that have sprung up, ranging from small-scale to large-scale businesses. The development of the people's business sector is a tangible manifestation of the government's seriousness to equalize the economy in Indonesia. therefore, it is natural for many programs that are in the Central Government and Regional Governments to mention and include business development. Thus, its existence is expected to increase the demand for agricultural commodities.

One of the plantation commodities that has become an economic choice for people in Rambah Subdistrict, Rokan Hulu Regency, is sugar palm.

Sugar palm which is often called Nau or Enau which is a characteristic of the State of Indonesia is a plant with enormous economic potential. Many products from the palm plant have enormous economic benefits if explored properly, one of which is palm sugar.

This industrial business is closely related to finance. The financial system is an important instrument in modern society's civilization whose task is to collect funds from the public and channel these funds to borrowers. Then, the borrowers will use the to be invested in the production or investment sector, as well as to be used for activities to buy goods and services. Therefore, economic activity can grow and develop as well as improve the standard of living of the community.

The production of Palm Sugar in SME certainly requires production factors (input) in the form of palm sap, labor, and production equipment. This means that the Palm Sugar SME does not only think about how many liters of palm sap, labor, and production equipment are used for optimal profit, but also considers the type of palm sap used in the production process, whether it is in the halal and good category, how much labor is used, and how much palm sugar is produced to reach the optimum mashlahah.

Palm sugar products produced by Palm Sugar SME in Rokan Hulu Regency become valuable not because of the various physical attributes of palm sugar, but also determined because of the value that is considered valuable by consumers. Physical attributes attached to palm sugar products, such as the manufacture of raw materials for palm sugar, quality of palm sap, quality and durability of palm sugar, shape or design of palm sugar, and others. The physical attributes of palm sugar, in essence, determine the functional role of palm sugar in meeting consumer needs. Meanwhile, on the other hand, the value contained in palm sugar will provide psychological satisfaction to consumers in utilizing the palm sugar. This value can be sourced from the image or brand of the palm sugar, the history of its production, the reputation of the producer, and others.

Based on the background of the problem and also departing from the descriptions above, the researchers were motivated to conduct a study entitled: **"PRODUCTION ANALYSIS OF AREN SUGAR SME FROM SHARIA PERSPECTIVE IN ROKAN HULU REGENCY, RIAU PROVINCE, 2020"**

### Research Problem Formulation

Based on the background of the study described above, the formulation of the problem posed in this study is "Has the Production of Palm Sugar SMEs in Rokan Hulu Regency, Riau Province in 2020 Reached the Optimal Mashlahah?"

### Research Objectives

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The objectives of this study are to find out and analyze whether the production of Palm Sugar SMEs in Rokan Hulu Regency, Riau Province, in 2020 had reached the optimal mashlahah.

### Literature Review

Based on the problems stated regarding whether the production of Palm Sugar SMEs in Rokan Hulu Regency, Riau Province in 2020 has reached the optimal mashlahah, for this reason, in this literature review, related theories and underlying sharia perspective production analysis are presented.

### Theoretical Basis

In the literature review, the research components are explained, namely production, production factors, production concepts, Small and Medium Enterprises, and palm sugar SMEs.

### Production

Production is a human activity to produce and add value to the benefits (utility) of an item, which is then utilized by consumers. Meanwhile, technically, production is a process of transforming production factors (inputs) into products (outputs). The concept of production in the perspective of Islamic Economics is not just a consumption chain that provides consumer needs for goods and services and is not the ultimate goal of economic activity and even life. It means that production is only a means to achieve a nobler goal and support for Aqedahand the mission it carries.

The definition of production can cover various aspects including the purpose of the activity to produce output, and also the characteristics attached to it. There are several different definitions of the meaning of production from several Islamic economists as follows:

a. Siddiqi (1979) defines production activities as providing goods (products) by emphasizing the value of justice and benefit (mashlahah), for consumers, in his perspective, as long as producers act fairly and bring benefits to consumers, the producer has acted Islamically.

b. Kahf (1992) defines production activities in an Islamic perspective as a human effort to improve not only his physical material condition but also his morality, as a means to achieve the goal of life, as outlined in Islam, namely the happiness of the world and the hereafter.

c. Mannan (1992) defines production by emphasizing the importance of altruistic motives for Islamic producers. Thus, he responds carefully to the concepts of Pareto Optimally and Given Demand Hypothesis.

d. Rahman (1995) also emphasizes the importance of fairness and even the distribution of production.

Products produced by producers have formed two elements (P3EI, 2009: 260): (1) physical attributes such as raw materials for manufacture, quality, the durability of goods, shape or design of goods, et cetera, and (2) the value that is considered valuable by consumers. The physical attributes of an item essentially determine the functional role of the item in meeting consumer needs. The other element in the form of the value contained in an item will provide psychological satisfaction to consumers in utilizing the item, which can be sourced from the image or brand of the item, history, reputation of the manufacturer, and others.

Therefore, it can be explained that a product is required to have two elements in the form, physical attributes which are objective can be compared with each other, and the value attached to an item of subjective value, possessing Islamic values, which will give blessings at last (P3EI, 2009: 259). These two elements can create mashlahah. Based on this perspective, the number of products that have mashlahah can be described as follows:

$$QM = QF + QB$$

Description:

QM: items that have mashlahah

QF: items that have physical attributes

QB: items that have a blessing value

### Factors of Production

Production activities certainly require various types of economic resources or also called factors of production (inputs). Factors of production are all things that become inputs, either directly or indirectly in the production process. Products can be consumed by consumers due to the combination of the various production process to produce products.

Palm sugar cannot be produced only with the availability of nira water (palm sap) alone, the means of production alone, or SME alone. Palm sugar can be enjoyed by consumers thanks to the availability of sufficient ingredients, which are processed by workers, either manually or using simple machines. After it becomes palm sugar, it is sold or distributed by traders to consumers. The whole process of making palm sugar requires coordination from SME leaders who certainly have managerial skills and entrepreneurial spirit and requires capital or costs. Palm sugar is a product that looks simple and has low value, but in fact, it also requires a fairly long process, involving various production factors to produce it.

Blessing is an important element in mashlahah(P3EI, 2009: 263). After all and whatever the classification, blessings must be included in the factors of production. The blessing is attached to every factor of production used in production and is also attached to the production process. Thus, the output of the production process will contain blessings. Including blessing as a factor of production is rational, because blessing has a real share in shaping output.

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Palm sugar products produced with a blessing as a production factor, then with a high blessing production factor will produce palm sugar products with a high blessing content as well, compared to using a low blessing production factor. This has an impact on the mashlahah of palm sugar products which is also high. Palm sugar products with high mashlahah will be considered as high-value palm sugar products, and vice versa.

### Production Concept

Based on the understanding of production and factors of production, and by observing the explanations above, a completely different concept of production is needed from the existing ones. The concept of production is naturally based on Islamic values or in other words the concept of production from an Islamic perspective. The application of the concept of production from an Islamic perspective is an exploration of Islamic values and principles in production.

The spirit of production to produce optimal mashlahah certainly requires guidance with Islamic economic values and principles. The main values and principles in production are as follows (P3EI, 2009: 267):

1. Amanah. It is one of several important values in Islam, which must continue to be upheld, in the context of "using economic resources to achieve the goals of human life (Falah)." The resources that exist in this universe by Allah are entrusted to humans. It is not allowed to exploit and obtain them in an improper way.

2. Professionalism. Every Muslim is required to become a professional production actor in the context of "having professionalism and competence in their field." All matters must be done properly and correctly. Therefore, every business must be left to the experts. This implies that every production actor in Islam must have standard expertise to be able to carry out production activities.

3. Learning. It is a lifelong mandate from Islamic teachings, meaning that every Muslim production actor needs to continuously learn, one of the learning media to learn is the working place. From this workplace, the production actor will gradually be able to gain expertise in production, thus, his workability will increase. With the increasing ability, the products that can be produced also increase, because the production actors are more efficient.

### Small and Medium Enterprises

Small and Medium Enterprises or commonly referred to as SME is an enterprise that has a small and medium scale industry. According to the Regulation of the Minister of Industry No. 64 of 2016 Article 3 Paragraph 1 concerning Small Industry. The small industry is an industry that employs a maximum of 19 (nineteen) workers and has an investment value of less

than IDR 1,000,000,000 (one billion rupiahs), excluding land and buildings for business premises. Meanwhile, Kristiyanti (2012) defined a small business as an economic activity carried out by individuals or households or an entity aimed at producing goods or services for commercial trade and having a sales turnover of 1 (one) billion rupiah or less.

The requirements or criteria to be classified as a small business or enterprise according to Law No. 9 of 1995 concerning Small Business, Article 5 Paragraph 1 as follows:

1. Possessing a net worth of at most IDR 200,000,000 (two hundred million rupiahs), excluding land and buildings for business premises, or

2. Possessing a maximum annual sales of IDR 1,000,000

3. Owned by Indonesian Citizens

4. Independent or stand-alone, not an aspect of a company or branch of a company that is owned, controlled, or affiliated either directly or indirectly with a Medium or Large Enterprises.

5. In the form of an individual business entity, a business entity that is not a legal entity, or a business entity that is a legal entity, including cooperatives.

### Palm Sugar SMEs

Sugar palm which is often called Nau or Enau which is characteristic of the Republic of Indonesia is a plant with enormous economic potential. Many products from the palm plant have enormous economic benefits if explored properly, such as palm sugar, crystal sugar, and health drinks. In Rokan Hulu Regency, especially Rambah Subdistrict is a palm sugar production center in 2014. It produced 14 tons of palm sugar (BPS - Statistics Rokan Hulu Regency, 2014). Palm sugar production in Rambah Subdistrict, Rokan Hulu Regency, is palm sugar that has good quality and can still be developed. Rambah Subdistrict is famous as a producer of traditional palm sugar which is processed from palm sap (Arenga pinnata). The main raw materials are obtained from palm trees which are cultivated for generations, where the palm trees have not been cultivated en masse.

The palm sugar SME which is fostered by the Department of Trade and Industry of Rokan Hulu Regency shows good development. It can be seen from the packaging that has been made more attractive and modern. Furthermore, the palm sugar products produced are not only in the form of solid/printed palm sugar but also palm sugar in the form of powder which is commonly referred to as powdered sugar/crystal sugar.

### Conceptual Framework and Hypothesis

In this section, two things are presented, namely the conceptual framework and research hypothesis. The conceptual framework is used to direct research

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to prove whether the research hypothesis is true or false.

### Conceptual Framework

The conceptual framework of the analysis of palm sugar production in Rokan Hulu Regency, Riau Province in 2020, can be described as follows:

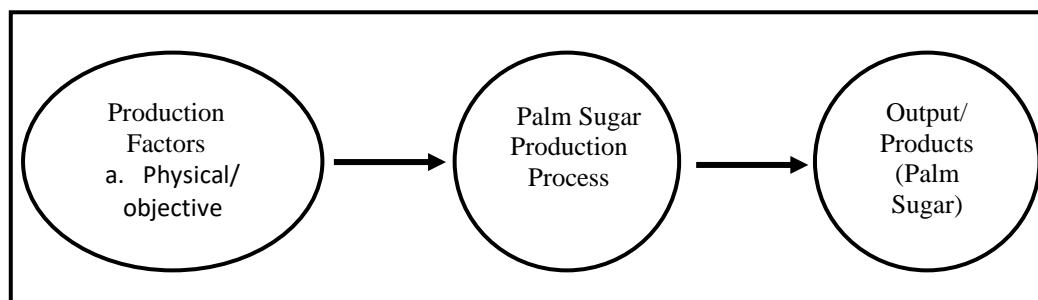


Figure 1. Conceptual Framework

Source: P3EI, 2009

Figure 1 above visualizes that there are three aspects, namely: (1) resources (inputs) which are described as factors of production consisting of (a) physical/objective and (b) value/subjective, (2) the production process, and (3) result (output). These three aspects are studied based on physical attributes, for example, the manufacture of raw materials from palm sugar in the form of palm sap and the value that is considered beneficial for producers and consumers.

### Hypothesis

A hypothesis is a tested statement that express a rationally estimated link between two or more variables (Sekaran, 2009). The hypothesis provided in this study is that the palm sugar SMEs production in Rokan Hulu Regency, Riau Province in 2020 has not yet attained the optimal mashlahah.

### Research Metode

#### Research Location

This study was carried out on the Palm Sugar Small and Medium Enterprises in Kaiti Village, Rambah Subdistrict, Rokan Hulu Regency.

### Data Types and Sources

The type of data used in this study was quantitative data, obtained directly from the object of the study, namely Palm Sugar Small and Medium Enterprises (SMEs) craftsmen in Kaiti Village, Rambah Subdistrict, Rokan Hulu Regency, which is also said to be primary data.

### Population and Sample

The population in this study were palm sugar craftsmen in Rokan Hulu Regency, grouped into two groups of Small and Medium Enterprises (SMEs), namely HPR (Himpunan Pemuda Reformasi) SME and Barokah SME, each of which consisted of 20

craftsmen and 10 craftsmen. The samples taken were 50 percent of the population, namely 15 respondents, consisting of 10 craftsmen from HPR SME and 5 (five) craftsmen from Barokah SME. All respondents were domiciled in Rambah Subdistrict, as the center of palm sugar production in Rokan Hulu Regency, Riau Province.

### Analysis Method

The data analysis method in this study, the Analysis of Palm Sugar SME Production from a Sharia Perspective in Rokan Hulu Regency, Riau Province in 2020 was a quantitative method with descriptive data analysis. The data analysis method consisted of two sub-sections, namely data analysis model and data analysis techniques.

This study employed a data analysis model of Comparative Approach in two forms of the production process, namely: (1) The production process which contained 95% of sharia elements (optimal mashlahah) and (2) the production process that contained < 95% of sharia elements (not optimal mashlahah). Meanwhile, the data analysis technique employed was the Descriptive Technique. After all the data were collected and processed in such a way, then they were analyzed descriptively quantitatively. Thus, the researchers can determine whether the production of Palm Sugar SME in Rokan Hulu Regency, Riau Province in 2020 has reached the optimal mashlahah, or not. Production analysis was done by analyzing aspects of production factors (inputs), production processes, and results (outputs). These three aspects were assessed based on physical attributes, for example, raw material for palm sap in the form of value that is considered beneficial for consumers.

Palm sugar craftsmen from each SME, namely HPR SME and Barokah SME, were categorized based on the production of original and mixed palm sugar.

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Furthermore, the percentage level of palm sugar craftsmen with the original printed palm sugar and mixed printed palm sugar was determined. The criteria used to determine the optimal achievement of mashlahah from printed palm sugar production were as follows:

1. Whether the number of original printed palm sugar craftsmen exceeds the number of mixed printed palm sugar craftsmen, and
2. Whether the total percentage of the original printed palm sugar craftsmen exceeds 95 percent of the total printed palm sugar craftsmen.

### Research Findings And Discussion

The results of the study and discussion were sourced from cross-sectional data (primary data) of palm sugar craftsmen as respondents. The data analyzed were respondents' answers on a questionnaire of 15 palm sugar craftsmen in Kaiti Village, Rambah Subdistrict, Rokan Hulu Regency, as the center of palm sugar production. The details of the research findings and discussion are explained as follows.

### Research Findings

In this section, the results of sequential data processing are presented in the form of respondent characteristics, and a description of palm sugar production at the research site.

### Characteristics of Palm Sugar Craftsmen

The description of the characteristics of the respondents is done to describe the palm sugar craftsmen in Rokan Hulu Regency in general. The characteristics of palm sugar craftsmen are presented based on their gender, age, educational level, and length of work experience in being palm sugar craftsmen. To be precise, the presentation of the characteristics of small and medium enterprises (SMEs) palm sugar craftsmen is described below.

### Respondents' Gender

The results showed that the gender of palm sugar Small and Medium Enterprises (SMEs) craftsmen in Rokan Hulu Regency were as follows:

**Table 1. Respondents' Gender in Palm Sugar SMEs in Rambah Subdistrict, Rokan Hulu Regency in 2020**

No.	Gender	Palm Sugar Craftsman (Person)	Percentage (%)
1.	Male	15	100
2.	Female	0	0
Total		15	100

Source : Processed Primary Data, 2020.

Table 1 above presents that the craftsmen in the Palm Sugar Small and Medium Enterprise in Rambah Subdistrict, Rokan Hulu Regency were dominated by men of 100%. The activity of producing palm sugar requires strong stamina. Thus, there is no mistaking that the majority of palm sugar craftsmen are men, while women are only limited to helping men in the palm sugar production process, including maintaining

the process of cooking palm sap until boiling several times.

### Respondents' Age

The results showed that the age of Palm Sugar Small and Medium Enterprises (SMEs) craftsmen in Rokan Hulu Regency were as follows:

**Table 2. Respondents' Age in Palm Sugar SMEs in Rambah Subdistrict, Rokan Hulu Regency in 2020**

No.	Age	Palm Sugar Craftsman (Person)	Percentage (%)
1.	< 30	1	6.67
2.	30 - 39	3	20.00
3.	40 - 49	3	20.00
4.	50 - 59	5	33.33
5.	≥ 60	3	20.00
Total		15	100.00

Source: Processed Primary Data, 2020.

Table 2 above showed that the craftsmen in the Palm Sugar Small and Medium Enterprises (SMEs) in Rambah Subdistrict, Rokan Hulu Regency were mostly in their 50s (50-59 years old), 5 (five) people or 33.33%. Meanwhile, the craftsman under 30 was the least, 1 (one) person or 6.67%. It indicates that palm sugar craftsmen, in general, are aged at and

above 40 years, totaling 12 people (73.33%). Before the age of 40 or more, palm sugar craftsmen generally worked only as palm plant farmers and sellers of palm sugar production in the form of palm sap to palm sugar craftsmen or traditional palm wine producers or makers.



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### Respondents' Educational Background

The results showed that the level of education of Palm Sugar Small and Medium Enterprises (SMEs)

craftsmen in Rambah Subdistrict, Rokan Hulu Regency, was as follows:

**Table 3. Respondents' Educational Background in Palm Sugar SMEs in Rambah Subdistrict, Rokan Hulu Regency in 2020**

No.	Educational Background	Palm Sugar Craftsman (Person)	Percentage (%)
1.	Elementary School	10	66.67
2.	Junior High School	4	26.66
3.	Senior High School	1	6.67
Total		15	100.00

Source: Processed Primary Data, 2020.

Based on Table 3 above, it can be seen that the craftsmen in the Palm Sugar Small and Medium Enterprises (SMEs) in Rambah Subdistrict, Rokan Hulu Regency were mostly elementary school graduates, 10 people (66.67%). Meanwhile, only one of them graduated from senior high school (6.67%).

The information related to craftsmen's educational background indicates that the palm sugar production process does not require higher education. On average, palm sugar craftsmen in Rambah Subdistrict, Rokan Hulu Regency possessed an

elementary school diploma. Thus, it can also be said that the skills possessed by sugar palm farmers are skills passed down from generation to generation (taught by parents).

### Respondents' Length of Work Experience

The results of the study indicate that the length of work experience in being Palm Sugar Small and Medium Enterprises (SMEs) craftsmen in Rambah Subdistrict, Rokan Hulu Regency were as follows:

**Table 4. Respondents' Length of Work Experience as Craftsmen of Palm Sugar in Small and Medium Enterprises (SMEs) in Rambah Subdistrict, Rokan Hulu Regency in 2020**

No.	Length of Work Experience (Year)	Palm Sugar Craftsmen (Person)	Percentage (%)
1.	≤ 5	2	13.33
2.	6 - 10	3	20.00
3.	11 - 20	4	26.67
4.	> 20	6	40.00
Total		15	100.00

Source: Processed Primary Data, 2020.

Table 4 above presents that most of the Palm and Sugar Small and Medium Enterprises (SMEs) craftsmen (6 people, 40.00%) in Rambah Subdistrict, Rokan Hulu Regency had the longest working period of over 20 years. Meanwhile, the shortest length of work experience was the same as or under five years, 2 (two) craftsmen (13.33%).

The above shows that the palm sugar production business in Rambah Subdistrict, Rokan Hulu Regency, is a hereditary business from parents to their children, and so on. Moreover, it is also due to the control over the sugar palm plantations by way of hereditary.

### Palm Sugar Production

Palm sugar is the output of the production process with the input in the form of palm sap. Thus, it means that there are three components in the production of palm sugar, namely: (1) Input, (2)

Production Process, and (3) Output. To be precise, the three components can be described as follows.

### Palm Sugar Input

Producing palm sugar certainly requires production factors. One of the main production factors is palm sap as the raw material for palm sugar. Other production factors in the form of labor consist of the main workforce, namely the head of the family, and additional workers are his wife and children. Whereas, other production factors in the form of capital goods are in the form of palm kitchen, cooking stove, and cooking utensils (cauldron, stirrer, filter, et cetera) as well as printing equipment.

Palm sap as input and palm sugar has a relatively high economic value from Palm Plants (*Arenga pinnata* Merr), where the production process is very unique. This uniqueness can be compared with the production of coconut plants, or oil palm plants. To

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produce palm sap, the sugar palm plant is harvested from the top and continues down, while the harvest of coconut and oil palm plants starts from the bottom and continues upwards. This is the uniqueness of the sugar palm plant, for the longer it takes to harvest it, the lower it is to harvest. It is different with coconut and oil palm plants, where the longer it takes to harvest, the higher it is to harvest.

Palm sap as raw material for the manufacture of palm sugar was obtained from tapping the male flower bunches of palm plants that are 8-9 years old. The tapping of palm plants was carried out twice a day, namely in the morning and afternoon. The results of afternoon tapping that were harvested in the morning were more numerous compared to the results of morning tapping which were harvested in the afternoon, with a ratio of 3:1. For example, if the harvest of palm sap is 15 liters, then the harvest in the

morning is approximately 10 liters while the harvest in the afternoon is only about 5 (five) liters.

The difference in the amount of palm sap harvest in the morning and evening is caused by the situation and weather conditions. In cold weather, starting from afternoon, midnight, until dawn, palm sap drips more heavily compared to the morning, afternoon, until late afternoon when the weather is hotter. Thus, palm sap drips more slowly. Besides being influenced by weather conditions, the amount of palm sap harvest is also determined by the fertility and care of sugar palm plants. For this reason, it is necessary to treat palm plants including (1) fertilizing, (2) watering during the dry season, and (3) controlling the weed.

The daily use of input (palm sap) from palm sugar craftsmen in Rambah Subdistrict, Rokan Hulu Regency can be observed in the following table:

**Table 5. Respondents' Input Usage (Palm Sap) in Palm Sugar SMEs in Rambah Subdistrict, Rokan Hulu Regency in 2020**

No.	Input (liter)	Palm Sugar Craftsman (person)	Percentage (%)
1.	≤ 5	1	6.67
2.	6 - 10	2	12.50
3.	11 - 15	6	40.00
4.	16 - 20	5	33.33
5.	>20	1	6.67
Total		15	100,00

Source: Processed Primary Data, 2020.

Table 5 above presents that the use of palm sap input per day was at most 11 to 15 liters, 6 (six) people (40.00%). Meanwhile, the least and the most use of palm sap input were below and equal to 5 (five) liters, and above 20 liters, respectively, each 1 (one) person or 6.67%.

Based on the use of input, palm sugar craftsmen can be grouped into sharia craftsmen and nonsharia craftsmen. Craftsmen whose raw material is sharia used one hundred percent palm sap, while those who are not sharia used raw materials in the form of palm sap mixed with sugar.

### Palm Sugar Production Process

Processing of palm sap with processed products in the form of palm sugar is generally done traditionally on a craftsman scale. Processing was carried out based on skills and knowledge from generation to generation. The use of innovative technology was found in the processing in the Small and Medium Enterprises (SMEs) which aims to increase productivity, production process efficiency, quality improvement, meeting consumer demand, and including the processing of palm sugar in the crystal form. The use of advanced technology is found in the processing/production process itself, with a relatively large investment.

In the process of palm sugar production, the quality of palm sap has to be paid attention to, in the sense that palm sap is not damaged or becomes sour, with a pH level of 7 (seven) to 8 (eight). Palm sap that has become acidic cannot produce quality palm sugar. To anticipate this, sugar palm farmers are obliged to do the following:

1. Cleaning the palm sap storage container and rinsing it using boiling water and drying it near the palm sap cooking furnace.

2. Putting into the storage container pieces of a certain type of tree root (raru) that are bruised, or using mangosteen rind/ unripe mangosteen fruit/mangosteen leaves, because the sap from the roots of the raru and mangosteen trees is what makes palm sap not sour before harvesting or before processing into palm sugar.

These two things complement the authenticity or purity of palm sugar production.

Producing palm sugar has a purpose. The aim is to create blessings and increase enjoyment for human life, not only to create and add value to products in meeting consumer needs. The needs of mankind (consumers), the fulfillment of which is not sufficient for physical material needs, but also the fulfillment of abstract material needs, namely the fulfillment of the needs of Allah Azza Wajjallah (hablumminallah).

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Palm sap that has been harvested was immediately taken to the place of processing, or also called the palm kitchen. It was in the palm kitchen that the input/raw material (palm sap) was processed into palm sugar through the production stage (production process) as follows:

1. Pouring palm sap into the cauldron/cooking container, by first doing a filter using a filter to prevent ants and other waste at the time of holding palm sap to enter into the process of making palm sugar to maintain the quality of palm sugar.

2. Lighting firewood to cook the palm sap until it boils several times to make the water content shrinks and the palm juice thickens. If the palm sap has thickened, it means that the palm sap is old (the term becomes honey), and the color changes to reddish-yellow. After that, it needs to be stirred continuously until thick and begins to freeze. It is estimated to take between 4 (four) to 5 (five) hours.

3. Putting the palm sap which has thickened and started to freeze into a mold made of wood that has been prepared in advance. Leaving it for about twenty minutes for the cooking process. Thus, the palm sugar does not stick to the mold. For one mold, 10 palm sugar blocks are printed with each size, 18 cm long, 8 cm wide, and 3.5 cm thick, where 1 (one) palm sugar block weighs 0.5 Kg, meaning that one mold produces 5 (five) Kg of palm sugar.

4. Removing from the mold and placing in the prepared place, until the palm sugar is completely cold. When the palm sugar has cooled completely, then it is wrapped using dried banana leaves and tied with a rope from a plastic burlap sack.

5. Putting into a box that is branded and ready to be traded (marketed).

The production stages above are the process of making original printed palm sugar carried out by sharia palm sugar craftsmen. On the other hand, the production process of printed palm sugar is mixed (not sharia), by adding granulated sugar in the first stage of making printed palm sugar.

### Output (Palm Sugar)

Palm sugar is the output of the use of inputs/production factors with the raw material is palm sap. Palm sugar production undergoes several stages of production in the production process. Furthermore, craftsmen from Small and Medium Enterprises of the Himpanan Pemuda Reformasi (HPR) SME and the Barokah SME also produced powdered sugar with very limited production in producing palm sugar. It is said to be very limited because the production is relatively small and cannot be duplicated. Thus, it cannot meet market demand. The 15 craftsmen as samples that produce original and mixed sugar as well as powdered sugar can be observed in the following table:

**Table 6. Respondents' Output Classification (Original and Mixed Sugar and Powdered sugar) in Palm Sugar SMEs in Rambah Subdistrict, Rokan Hulu Regency in 2020**

No.	Small and Medium Enterprise (SME)	Palm Sugar Craftsman (Person)			
		Printed Sugar		Powdered Palm Sugar	Percentage (%)
		Original	Mixed		
1.	HPR	7	3	3	20.00
2.	BAROKAH	3	2	1	6.67
Total		10	5	4	26.67
Percentage (%)		66.67	33.33	26.67	

Source: Processed Primary Data, 2020.

Table 6 presents that all respondents produced palm sugar, while only a small proportion of respondents produced powdered palm sugar, namely 4 (four) respondents of 26.67%. Respondents who produce original palm sugar were 10 respondents or 66.67% and the remaining 5 (five) respondents produced mixed palm sugar of 33.33%.

The production of powdered palm sugar in the production process used palm sap input which had good quality with a pH of 7 to 8, with a clear yellowish color, odorless, and tasted sweet that was not mixed

with granulated sugar. This indicates that palm sugar craftsmen who produce palm sugar are categorized as sharia palm sugar craftsmen, 26.67%.

### Discussion

The processing of palm sugar depends on the intentions and objectives of each palm sugar craftsman (producer). Processing in general, carried out by palm sugar craftsmen, can be categorized into two, namely:

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(a) Sharia palm sugar craftsmen: using pure raw materials (one hundred percent) palm sap in the production process of printed palm sugar, referred to as original palm sugar, sold with a price range of IDR 25,000 to IDR 30,000 per Kg, or as many as two blocks.

(b) Non-sharia palm sugar craftsmen: using mixed raw materials, not one hundred percent palm sap, meaning that in the printed palm sugar production process, there are ingredients other than palm sap, such as granulated sugar (molasses), or commonly called sugar. Mixed palm sugar was sold with a price range of IDR 20,000 to IDR 25,000 per Kg, or two blocks as well.

The prices above apply to the level of palm sugar craftsmen (producers) in Rokan Hulu, Riau, both for original palm sugar and mixed palm sugar.

Sharia palm sugar craftsmen (group a) were creating and increase mashlahah in their production process to achieve an essential profit with the framework of Islamic goals and laws as well as optimally sustainability. Meanwhile, non-sharia palm sugar craftsmen (group b) were only oriented towards getting big and temporary profits and losing money in the long term. Furthermore, it also harmed consumer confidence. In the end, consumers leave the mixed product. Producers who lie to consumers are prohibited in Islam (not justified), for they are sinful.

The production of palm sugar from a group of sharia craftsmen achieves the blessing and enjoyment of original palm sugar and gains the trust of consumers. Consumer trust is a guarantee of production sustainability. Sustainability of production is a condition of achieving mashlahah. This is different from the group of palm sugar craftsmen who produced printed sugar without sharia. Naturally, they will not reap the blessings and enjoyment of the original palm sugar, and the sustainability of production might face challenges from consumers in the form of product rejection. The discontinuity of production is a condition of not achieving mashlahah.

The results of this study indicate that the production of Palm Sugar SME in Rokan Hulu Regency, Riau Province in 2020 still has not reached the Optimal Mashlahah. This can be observed from the number of printed palm sugar craftsmen in Rokan Hulu Regency who were not sharia, which reached 33.33. in another sense, 33.33% was still too far from 5 (five) percent. On the other hand, the number of

craftsmen who produce original printed palm sugar is 66.67%, or in another sense, there is 66.67 percent of printed palm sugar craftsmen in Rokan Hulu Regency that are following sharia perspective. Yet, it is still far from 95%.

Apart from the indication above, it can also be observed from the small number of palm sugar craftsmen who produce powdered palm sugar, 26.67%. This is because: (1) to produce powdered palm sugar, good quality palm sap raw materials are needed with a pH ranging from 7 to 8 with indications, odorless, clear yellowish color, and sweet taste; (2) Raw materials palm sap cannot be mixed with other ingredients such as granulated sugar (cannot be mixed).

## Conclusions And Suggestions

### Conclusion

Based on the results and discussions that have been described previously using the descriptive analysis technique, the research objectives of this study can be realized and the following conclusion can be drawn. The production of Palm Sugar Small and Medium Enterprises (SMEs) in Rokan Hulu Regency, Riau Province in 2020 has not reached the optimal mashlahah.

### Suggestion

Since the conclusion that the production of Palm Sugar Small and Medium Enterprises (SMEs) in Rokan Hulu Regency, Riau Province in 2020 has not reached the optimal mashlahah, several suggestions are proposed as follows:

1. Inviting and urging palm sugar craftsmen to no longer mix raw materials in the production process, to realize the addition of mashlahah, not just adding material.
2. Conducting literacy to palm sugar craftsmen about the production process from an Islamic perspective, following the guidance of the Qur'an, with a vision of the future that is not only oriented towards making short-run profits but also causing long-run losses.
3. Instilling Islamic values to palm sugar craftsmen gradually and continuously, by forming small recitation groups, at least once a week after Friday prayers with a time not exceeding 30 minutes.

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Article



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## A STRATEGY TO IMPROVE THE PERFORMANCE OF CREATIVE INDUSTRY BUSINESSES UTILIZING RATTAN AS RAW MATERIAL IN PEKANBARU

**Abstract:** The rapid industries development of a formal and informal sector in Indonesia encourages the actors of business to compete each other in the businesses they run. The informal business sector consists of home industries, agriculture, trade and plantations. In Indonesia, those working in informal business sector is estimated to be around 58.19 million people in 2019 (Statistics Indonesia, 2019). These informal sector business groups are scattered across the villages and cities. In Pekanbaru, the typical creative industry of the community's culture grows rapidly marked by the number of handicraft industry centers, one of which is the handicraft made of rattan. Handicraft made from rattan have grown and developed in Pekanbaru, scattered across several places. The actors of business with a profession as rattan craftsmen produce these handicraft products to be marketed in the Riau area and outside areas like Batam, Medan, and other areas. If viewed from the prospect of this rattan-based industrial business, it is very prospective. Many consumers come from local communities and foreign communities such as Malaysia and Singapore to buy handicrafts produced by rattan craftsmen in Pekanbaru. This creative industry business made from local raw materials is very possible to develop, yet the problems experienced by rattan craftsmen include the small number of employees, the less productive business actors in producing goods/crafts from rattan, less variation in rattan-made goods/crafts production and lack of public interest in goods/crafts made from rattan.

**Key words:** Training, Entrepreneurial Motive, Entrepreneurial Spirit, Business Performance.

**Language:** English

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### Introduction

The rapid industries development of a formal and informal sector in Indonesia encourages the actors

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of business to compete each other in the businesses they run. The informal business sector consists of home industries, agriculture, trade and plantations. In Indonesia, it is estimated that around 58.19 million people have the status of business actors in the informal business sector in 2019 (Statistics Indonesia, 2019). These informal sector business groups are scattered across the villages and cities.

Pekanbaru is one of the regions in Indonesia having many typical creative industries of the

communities' culture growing rapidly. There are so many handicraft industry centers managed by the business community in Pekanbaru, one of which is made of rattan. The existing handicrafts made from rattan growing and developing in Pekanbaru are scattered across several places. The actors of business with a profession as rattan craftsmen produce these handicraft products to be marketed in the Riau area and outside areas like Batam, Medan, and other areas. It can be seen from the table below:

**Table 1. Data Of Rattan Craftsmen In Pekanbaru**

Respondent	Name	Gender	Age/Year	Length of Work	Last Education
1	EzaSusilawati	F	52	5	Junior High School
2	Erni	F	37	12	Senior High School
3	Emi MasraFeny	F	58	14	Junior High School
4	Rahmat	M	34	13	Senior High School
5	Tia Juwita	F	31	7	D3
6	DewiMurniati	F	35	12	Junior High School
7	Mira Erawati	F	40	13	Vocational High School
8	AtangAdmaja	M	37	29	S1
9	Erizal	M	56	8	Senior High School
10	Sugianto	M	59	12	Junior High School
11	Dona	F	52	12	Senior High School
12	Dahyani	F	36	13	Senior High School
13	Syafril	M	67	18	Senior High School
14	Alfan	M	28	7	Junior High School
15	Dani	M	32	5	Senior High School
16	Mulyadi	M	45	6	Senior High School
17	Edison	M	57	7	Senior High School
18	Efrita	F	56	7	Senior High School
19	Sarinah	F	53	10	Junior High School
20	Sarbani	M	33	11	Junior High School
21	Edi	M	30	11	Junior High School
22	Ombeng	M	27	11	Junior High School
23	Warman	M	25	11	Senior High School
24	Pendi	M	38	10	Senior High School
25	Randy	M	40	10	Senior High School
26	Darlin	F	36	13	Senior High School
27	Romi	M	43	10	Junior High School
28	Eriyanto	M	35	10	Junior High School
29	Edy	M	29	13	Junior High School
30	Esi	F	40	13	Elementary School
31	Zuladi	M	35	13	Elementary School
32	Man Nias	M	32	13	Junior High School

## Impact Factor:

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33	Rasidi	M	36	13	Junior High School
34	Sihen	M	30	13	Senior High School
35	Zakiyah	F	40	10	D3
36	Rudi	M	43	10	S1
37	Wahid	M	49	12	S1
38	Atik	F	57	12	Senior High School
39	Wahyu	F	50	8	Senior High School
40	Marwoto	M	60	9	Elementary School

From table 1, it is seen that the prospect of this rattan-based industrial business is very prospective since there are many consumers coming from local communities and foreign communities such as Malaysia and Singapore to buy handicrafts produced by the rattan craftsmen. This rattan-based creative industrial business is very likely to progress and develop properly.

The problem experienced by rattan craftsmen in Pekanbaru is the difficulty of obtaining the required employees, so that there are only small number of employees of rattan craftsmen existing in Pekanbaru. Even though it looks simply, it requires good skills in weaving the rattan into the desired shape, and not everyone is an expert in this matter. This situation making rattan craftsmen have less production of goods which are the focus of their business. Another problem is the lack of product variation resulting in the community having less interest in re-purchasing the goods produced by these rattan craftsmen.

In addition, based on a survey conducted on rattan craftsmen in relation to the training they have attended, it turns out that some of the actors of business have attended training. However, the training did not match to what they need. Reviewing from some of these problems, it indicates the business performance of rattan craftsmen in Pekanbaru is still low.

Generally, the low performance of the business reflects the inability of the actors of business to manage their business. Clearly, it is due to the lack of knowledge regarding the handicraft industry utilizing rattan as raw material, and the business is still in the criteria of a family business. If seen from the length of the business time having been run, it should have developed well.

Based on the results of previous research on small and medium-sized enterprises (SMEs) in Pekanbaru, it is concluded that many factors cause low business performance such as lack of knowledge regarding financial management, low entrepreneurial motives, and lack of training, and community culture (Susi et al., 2018). Based on the research results, it is clear that low financial management skills, lack of training, community culture and entrepreneurial motives have a significant effect on business performance.

Business performance can be improved through training and the presence of high entrepreneurial motives, as well as strengthened by the spirit of entrepreneurship among the actors of business. Business performance is said to be good when characterized by an increase in operating profit as seen from an increase in sales, a growing market share and an increase in the number of employees.

The increase in business performance will very likely be realized if the actors of business have a high entrepreneurial spirit. Definitely, they will constantly try to improve and develop their business in a more strategic direction. The entrepreneurial spirit is a person's talent. If someone has an entrepreneurial spirit, it is not challenging for him/her to run a business in a better direction. Even so, this entrepreneurial spirit can also be created through training that is in accordance with the business being run and the high entrepreneurial motives that business actors get from both their internal and external environment.

Based on the description above, the authors conducted a study entitled "a strategy to improve the performance of creative industry businesses utilizing rattan as raw material in Pekanbaru."

### Identification and Research Question

Based on the aforementioned research background, the writers formulate the following research questions:

1. Does the training affect the business performance of creative industries utilizing rattan as raw material in Pekanbaru?
2. Does entrepreneurial motive affect the business performance of creative industries utilizing rattan as raw material in Pekanbaru?
3. Does the entrepreneurial spirit affect the business performance of creative industries utilizing rattan as raw material in Pekanbaru?
4. Does the training affect the business performance of creative industries utilizing rattan as raw material in Pekanbaru which is moderated by the entrepreneurial spirit?
5. Does the entrepreneurial motive affect the business performance of creative industries utilizing rattan as raw material in Pekanbaru which is moderated by the entrepreneurial spirit?



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### Research Purpose and Objective

Purpose and objectives of this study are:

1. To discover to what extent the effect of the entrepreneurial spirit on the business performance of creative industries utilizing rattan as raw material in Pekanbaru.
2. To discover to what extent the effect of the entrepreneurial spirit on the business performance of creative industries utilizing rattan as raw material in Pekanbaru.
3. To discover to what extent the effect of the entrepreneurial spirit on the business performance of creative industries utilizing rattan as raw material in Pekanbaru.
4. To discover to what extent the effect of the training on the business performance of creative industries utilizing rattan as raw material in Pekanbaru which is moderated by the entrepreneurial spirit.
5. To discover to what extent the effect of the training on the business performance of creative industries utilizing rattan as raw material in Pekanbaru which is moderated by the entrepreneurial spirit.

### Research Significance

Research results are expected to be useful both theoretically (academically) and practically, for details are as follows:

#### Theoretical Significance

- a. It can provide input for creative industries utilizing rattan as raw material in Pekanbaru, in connection with the steps taken to improve the business performance of creative industries, especially which utilizing rattan as raw material in Pekanbaru.
- b. For writers, this research is useful to increase knowledge and insight regarding a strategy to develop a creative industry utilizing rattan as raw material in Pekanbaru.

#### Practical Significance

- a. The study results are expected to add to the discourse of science and research development in the strategy to increase businesses performance of creative industry utilizing rattan as raw material in Pekanbaru.
- b. The study results are expected to explain the relationship between the strategy to increase businesses performance of creative industry utilizing rattan as raw material in Pekanbaru.

### Literature Review

#### Performance

Mangkunegara (2007) states that the term of performance is from job performance or actual performance (actual work performance or actual

achievement achieved by a person) is the quality and quantity of work achieved by an employee in carrying out her/his duties in accordance with the responsibilities assigned to her/him.

#### Indicators of Business Performance

1. Business Growth
2. Profit Increase
3. Increase in Product Sales
4. Increase in the Number of Human Resources
5. Market Share

#### Entrepreneurial Spirit

To develop an entrepreneurial spirit, several stages are needed, including internalization, paradigm alteration, spirit of initiation, and competition. Internalization is the stage of cultivating the entrepreneurial spirit through the construction of knowledge about the entrepreneurial spirit and the field in business.

##### Indicator of Entrepreneurship

1. Orientation to the uniqueness of the product
2. Use of Technology
3. Don't stop at opportunities
4. Dare to take risks
5. Starting a business from scratch

#### Training

Rivai (2010) states that training is a process of systematically changing employee behavior to achieve organizational goals.

Indicator of Training according to Muhammad Noer (2016)

1. Improving skills;
2. Reducing the rate of work accidents;
3. Improving quality;
4. Increasing productivity;
5. Improving work ethic;
6. Improving discipline

#### Entrepreneurial Motive

According to Buchari Alma (2013: 89): Motivation is the willingness to do something, while motive is a need, desire, drive or impulse. A person's motivation depends on the strength of his motive.

##### Indicator of Entrepreneurial Motive

1. Business development
2. Prosperity increases
3. Recognition of effort
4. Achievement oriented
5. Achievement of competitive advantage

#### Framework of Thinking

Based on the above framework, a research model is formulated as shown below:

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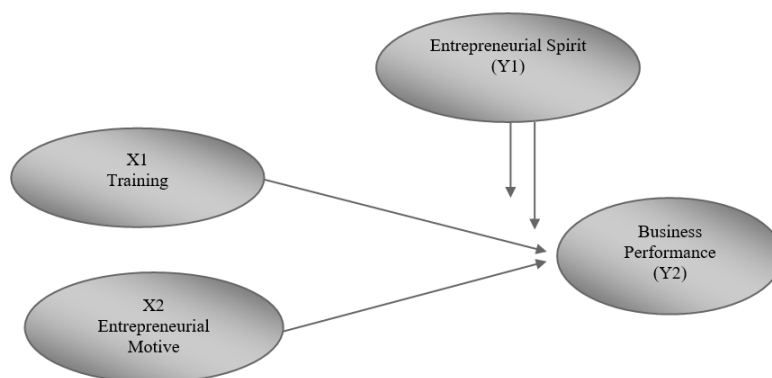


Figure 1. Thinking Model

### Research Hypothesis

Based on the aforementioned framework of thinking above, the writers formulate the following research hypothesis:

1. There is effect of Training on the business performance of creative industries utilizing rattan as raw material in Pekanbaru.
2. There is effect of the entrepreneurial spirit on the business performance of creative industries utilizing rattan as raw material in Pekanbaru.
3. There is effect of the entrepreneurial spirit on the business performance of creative industries utilizing rattan as raw material in Pekanbaru.
4. There is effect of the training on the business performance of creative industries utilizing rattan as raw material in Pekanbaru which is moderated by the entrepreneurial spirit.
5. There is effect of the training on the business performance of creative industries utilizing rattan as raw material in Pekanbaru which is moderated by the entrepreneurial spirit.

### Research Method

#### Research Site and Time

This study was conducted on creative industries utilizing rattan as raw material in Pekanbaru. The implementation of the study was carried out for 6 (six) months.

#### Data Type and Source

According to Umar (2009: 42), types of data can be grouped into two, namely primary and secondary data, and both types of data are used in this study. Further, Umar stated:

- a. Primary Data
- b. Secondary Data

#### Population and Sample

Ferdinand (2006) states that population is a combination of all elements in the form of events, things or people having similar characteristics becoming the center of attention of a researcher (the object to be studied). In this study, the population is all rattan craftsmen in Pekanbaru, as many as 40 people.

### Data Collection Technique

In this study, the data collection method used was the census method, where all the population is sampled (saturated sample).

### Data Analysis Technique

In this study, the data analysis tool used was descriptive and inferential analysis.

### Research Instruments Test

1. Validity is evidence that the instrument, technique, or process used to measure a concept actually measures the concept intended. The validity test aims at measuring the validity of a statement system.
  - a. If  $r_{count} > r_{table}$ , it means that the question item is valid
  - b. If  $r_{count} < r_{table}$ , it means that the question item is invalid
2. Reliability Test

Reliability is an index showing the extent to which a measuring device can be trusted or relied upon. If a measuring device is used twice or more to measure the same symptoms, and the results obtained are relatively consistent, the measuring device is reliable. Reliability test aims at measuring the consistency of a person's answer to the statement items in the questionnaire. Sekaran (2006)

### Classical Assumption Test

1. Multi-correlation Test  
The multi-correlation test aims at determining whether the relationship between the independent variables has a multi-correlation problem (multicollinearity symptoms) or not.  
The basics of the decision-making process:
  - a. If the VIF value  $< 10$ , there is no multicollinearity symptom among the independent variables.
  - b. If the VIF value  $> 10$ , there is multicollinearity symptom among the independent variables.
2. Normality test

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The normality test aims at determining whether a data distribution is normal or not. The test criteria are as follows:

- a. The significance of the Kolmogorov-Smirnov test Sig. > 0.05 indicates that the data are normally distributed.
  - b. The significance of the Kolmogorov-Smirnov test Sig. < 0.05 indicates that the data are not normally distributed
3. Auto-correlation Test

According to Wijaya in SarjonoHaryadi (2011), the autocorrelation test aims at testing whether in the linear regression model there is a correlation between disturbance errors.

Decision of the existence of autocorrelation:

- a. When the DW value is between dU and 4 - dU, the correlation coefficient is zero. It means that there is no autocorrelation.
- b. If the DW value is less than dL, the correlation coefficient is greater than zero. It means that there is a positive autocorrelation.
- c. If the DW value is greater than 4 - dL, the correlation coefficient is smaller than zero. It means that there is a negative autocorrelation.
- d. If the DW value lies between 4 - dU and 4 - dL, the results are inconclusive

### Hypothesis Test

#### Coefficient of Determination (R<sup>2</sup>) Test

The amount of the coefficient of determination (R<sup>2</sup>) on the independent variable. The coefficient of determination (R<sup>2</sup>) is said to be strong or weak, that is, if (R<sup>2</sup>) approaches the number 1, it means that the effect of the independent variables is simultaneously considered strong, and if (R<sup>2</sup>) approaches zero (0), the effect the independent variable on the dependent variable simultaneously is weak.

#### F-test

To test the significance of the effect of training and entrepreneurial motives simultaneously on entrepreneurial spirit and business performance of the actors of creative industry utilizing rattan as raw material in Pekanbaru, the F-test was used.

The test criteria are:

- a. If Fcount is greater than Ftable (Fcount > Ftable), it shows that the independent variables together have a significant effect on the dependent variable.
- b. If Fcount is smaller than Ftable (Fcount < Ftable), the result shows that the independent variables together have no significant effect on the dependent variable.

#### t-test

To test the significance of the effect of training and entrepreneurial motives partially on entrepreneurial spirit and business performance of the actors of creative industry utilizing rattan as raw material in Pekanbaru, the t-test was used.

- a. If tcount is greater than t table (t count > t table), it shows that the independent variables together have a significant effect on the dependent variable.
- b. If tcount is small than t table (t count < t table), it shows that the independent variables together have no significant effect on the dependent variable.

Furthermore, for data processing results from the writers' questionnaire using the Statistical Product and Service Solution program (SPSS VERSION 17.00).

### General Conditions of The Research Area History of Rattan Handicrafts in Pekanbaru, Riau

Pekanbaru as the capital of Riau Province is a very strategic city and has been designated as one of the national strategic areas. Pekanbaru is not only focused on the construction of goods terminals, but also the development of new industrial estates. Thus, it can fully support various existing large, medium and small industries.

Rumbai is one of the sub-districts in Pekanbaru which is strategically located where land and river transportation is a great way to support business development. One of the small businesses having the potential to develop in the Rumbai sub-district of Pekanbaru is a rattan handicraft business, which is a small, traditional industry and is a family business.

Initially, the location of the rattan handicraft center in Pekanbaru, around 1960 to 1970, was in the city center, precisely on Jalan M.Yamin. The craftsmen then moved their handicraft to YosSudarso, Rumbai sub-district, Pekanbaru. The reason they moved this handicraft business place was because it needed a bigger place, and the Rumbai area was a very strategic area to sell their handicrafts because it was close to the residential area of the Chevron oil company formerly known as Caltex. Since the relocation of the location, this rattan handicraft business has been more advanced.

#### Raw Materials of Rattan Handicraft

Raw materials of the rattan industry in the sub-district of Rumbai, Pekanbaru, are obtained from several regions, for more details, see the following table:

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**Table 2. Raw Materials Of Rattan Handicrafts And Their Origin**

No	Raw Materials	Origin
1	<i>Rotan Dandan (Calamus schitolantus Blume)</i>	Riau dan West Sumatra
2	<i>Rotan Manau (Calamus manan Miquel)</i>	Riau dan West Sumatra
3	<i>Rotan ManauPadi (Calamus marginatus [Blume] Mart)</i>	Riau dan West Sumatra
4	<i>Rotan ManauTikus (Calamus tumidus Furtado)</i>	Riau dan West Sumatra
5	<i>Rotan ManauRiang (Calamus oxleyanus T et B)</i>	Riau dan West Sumatra
6	<i>Rotan Lilin (Calamus javensis)</i>	Riau dan West Sumatra
7	<i>Rotan Semambu (Calamus Scipionum Lour)</i>	Riau dan West Sumatra
8	<i>Rotan Tunggal</i>	Riau dan West Sumatra

From Table 2, it can be seen that the raw materials used to make rattan handicraft are obtained from Riau and West Sumatra. It is of course very easy for rattan craftsmen and does not cost a lot of money to distribute.

**Products and Types of Rattan Handicrafts**

The types of products produced by the rattan handicraft industry in Rumbai sub-district, Pekanbaru, are quite diverse. It can be seen in Table 3 below:

**Table 3. Products And Types Of Rattan Handicrafts**

No	Products and Types of Rattan Handicrafts	Difficulty Level in Product Making
1	Stick	Easy
2	Movable Food Cover	Easy
3	Rice Pads/Plates	Easy
4	Hula-hoop	Easy
5	Rice Bowl	Easy
6	Decorative Lights	Easy
7	Palm Basket	Moderate
8	Clothes Basket	Moderate
9	Clothes Horse	Moderate
10	Mattress Beater	Moderate
11	Room Divider	Moderate
12	Horse Riding Toys	Hard
13	Baby Swing	Hard
14	Rocking Chair	Hard
15	Easy Chair	Hard
16	Guest Chair	Hard
17	Guest Table	Hard

Based on the data in Table 3, it can be seen that products made from rattan have different levels of difficulty in their manufacture, and special expertise is needed in making them.

**Research And Discussion  
Instrument Test**

**Reliability Test**

The results of the reliability test on the variable indicators of this study, which are business performance, entrepreneurial spirit, training and entrepreneurial motives, show that the indicators are realistic where cronbach's alpha  $\geq 0.6$ .

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**Table 4. Reliability Of Business Performance Variables**

**Reliability Statistics**

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.921	.924	5

**Table 5. Reliability of Entrepreneurial Spirit Variables**

**Reliability Statistics**

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.943	.943	5

**Table 6. Reliability of Training Variables**

**Reliability Statistics**

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.872	.874	5

**Table 7. Reliability of Entrepreneurial Motive Variables**

**Reliability Statistics**

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.885	.887	5

**Table 8. Reliability Value Each Variable**

No	Variable	Cronbach's Alpha
1	Business Performance	0.921
2	Entrepreneurial Spirit	0.943
3	Training	0.872
4	Entrepreneurial Motive	0.885

**Validity Test**

Based on the validity test conducted on the variable indicators of this study, it was found that all indicators of research variables consisting of business performance, entrepreneurial spirit, training and entrepreneurial motives were declared valid because

$r_{count} > r_{table}$  where the  $r_{count}$  value can be seen in the corrected item - total correlation, namely  $r_{count} > r_{table}$  ( $0.785 > 0.3120$  with  $df_{n-2} = 40 - 2 = 38$ ). It means that the indicator is said to be valid and other indicators are said to be valid because  $> 0.3120$

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**Table 9. The Validity Value of Business Performance Variables**

**Item-Total Statistics**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
KU1	11.80	14.985	.785	.632	.906
KU2	11.90	15.631	.785	.706	.905
KU3	11.90	15.323	.742	.664	.915
KU4	11.83	14.558	.834	.711	.896
KU5	11.88	15.958	.855	.762	.895

**Table 10. The Validity Value of Entrepreneurial Spirit Variables**

**Item-Total Statistics**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
JE1	11.25	14.551	.919	.858	.916
JE2	11.40	14.605	.845	.778	.931
JE3	11.55	15.946	.794	.639	.939
JE4	11.45	15.792	.821	.705	.934
JE5	11.55	15.536	.855	.731	.928

**Table 11. The Validity Value of Training Variables**

**Item-Total Statistics**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PEL1	11.48	13.076	.692	.514	.847
PEL2	11.70	13.344	.702	.539	.846
PEL3	11.78	12.281	.669	.497	.855
PEL4	11.83	12.507	.722	.541	.840
PEL5	11.73	12.410	.724	.530	.839

**Table 12. The Validity Value of Entrepreneurial Motive Variables**

**Item-Total Statistics**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
MB1	11.58	13.789	.775	.610	.849
MB2	11.75	13.321	.767	.637	.850
MB3	11.68	13.815	has	.546	.863
MB4	11.53	14.615	.668	.487	.872
MB5	11.48	12.666	.712	.545	.866

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Classical Assumption Test  
Residual Normality Test

**Table 13. Normality Test Each Variable**  
**One-Sample Kolmogorov-Smirnov Test**

			BUSINESS PERFORMA NCE	Zscore: TRAINI NG	Zscore: ENTREPRENEU RIAL MOTIVES	Zscore: ENTREPRENEU RIAL SPIRIT
N			40	40	40	40
Normal Parameters <sup>a,b</sup>	Mean		14.1740654	.000000 0	.0000000	.0000000
	Std. Deviation		4.21881224	1.00000 000	1.00000000	1.00000000
Most Extreme Differences	Absolute		.079	.107	.076	.107
	Positive		.079	.082	.076	.060
	Negative		-.057	-.107	-.076	-.107
Test Statistic			.079	.107	.076	.107
Asymp. Sig. (2-tailed)			.200 <sup>c,d</sup>	.200 <sup>c,d</sup>	.200 <sup>c,d</sup>	.200 <sup>c,d</sup>

- a. Test distribution is Normal.
- b. Calculated from data.
- c. Lilliefors Significance Correction.
- d. This is a lower bound of the true significance.

Data are normally distributed where  
Sig > 0.05

**Table 14. Normality Test for Overall Variables**  
**One-Sample Kolmogorov-Smirnov Test**

			Unstandardized Residual
N			40
Normal Parameters <sup>a,b</sup>	Mean		.0000000
	Std. Deviation		1.12896075
Most Extreme Differences	Absolute		.080
	Positive		.077
	Negative		-.080
Test Statistic			.080
Asymp. Sig. (2-tailed)			.200 <sup>c,d</sup>

- a. Test distribution is Normal.
- b. Calculated from data.
- c. Lilliefors Significance Correction.
- d. This is a lower bound of the true significance.

Based on the results of the study, it can be stated that the residuals of the regression model carried out are normally distributed. It can be seen from the

significance > 0.05, which is 0.02, meaning that the normality assumption is met.

*Multicollinearity Test*

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	<b>JIF = 1.500</b>	<b>SJIF (Morocco) = 7.184</b>	<b>OAJI (USA) = 0.350</b>

**Table 15. Multicollinearity Coefficients<sup>a</sup>**

Model	Collinearity Statistics	
	Tolerance	VIF
1 (Constant)		
Zscore: TRAINING	.179	5.597
Zscore: ENTREPRENEURIAL MOTIVES	.204	4.903
Zscore: ENTREPRENEURIAL SPIRIT	.372	2.692
ABSX1X3	.640	1.564
ABSX2X3	.591	1.692

Multicollinearity test aims at determining whether in the regression model there is a correlation between independent variables or not. The results show that there is no correlation between independent variables. It can be seen from the VIF <10. It means that the regression model is free of correlation between variables.

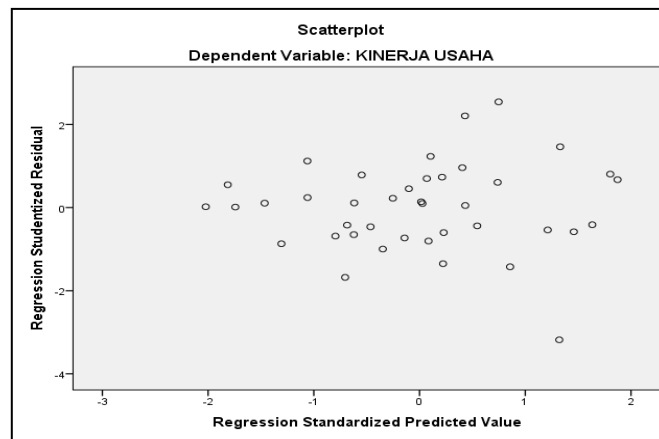
*Heteroscedasticity Test*

The heteroscedasticity test is used to determine whether there are deviations from the classic Heteroscedasticity assumption, namely the inequality of variants and residuals for all observations in the regression model, or not. Heteroscedasticity can lead to inefficient estimation of its parameters, so that it does not have a minimum variety. The parameter estimation is considered efficient because it has a minimum variance. Hence, the residual variance is constant.

The impact that will occur if there is a state of heteroscedasticity is that it is difficult to measure the actual standard deviation, which can result in a standard deviation that is too wide or too narrow. If the error rate of the variance continues to increase, the level of confidence will be narrower. To detect whether there is heteroscedasticity or not, one of which is by looking at the scatter plot. The basis for decision making according to Ghozali (2005) is:

1. If there is a regular pattern on the chart, like dots forming the above regularity (wavy, widened then narrowed), it indicates heteroscedasticity has occurred.
2. If there is no clear pattern, as well as dots that spread above and below the number 0 on the Y axis, then heteroscedasticity will not occur.

The following is a scatter plot image of the structural model to determine whether heteroscedasticity occurs or not in this study:



**Figure 2. Scatter plot Heteroscedasticity Test Results**

It can be seen from Figure 2 above that Heteroscedasticity does not occur where the data does not form a certain pattern based on the scatter plot.

*Residual Normality Test*



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**Table 16. Autocorrelation Test Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.964 <sup>a</sup>	.928	.918	1.20912636	1.914

a. Predictors: (Constant), ABSX2X3, Zscore: ENTREPRENEURIAL MOTIVES, ABSX1X3, Zscore: ENTREPRENEURIAL SPIRIT, Zscore: TRAINING

b. Dependent Variable: BUSINESS PERFORMANCE

Table 16 shows that the Durbin Watson (DW) test results of this study amounted to 1,914. It means that there is a correlation between the residuals (confounding errors) in this regression model. It can

be seen from the decision rule whether there is autocorrelation where  $0 < d < dl$ , where  $du < d < 4 - du$  =  $1,721 < 1,914 < 4 - 1,721$ .

*Coefficient of Determination (R<sup>2</sup>) Test*

**Table 17. Results of the Coefficient of Determination (R<sup>2</sup>) Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square
1	.964 <sup>a</sup>	.928	.918

a. Predictors: (Constant), ABSX2X3, Zscore: ENTREPRENEURIAL MOTIVES, ABSX1X3, Zscore: ENTREPRENEURIAL SPIRIT, Zscore: TRAINING

b. Dependent Variable: BUSINESS PERFORMANCE

The value of the coefficient of determination found in this study is 0.928, meaning that 92.8% of the variability of the dependent variable (Business Performance) can be explained by the independent variable (Entrepreneurial Spirit, Training and Entrepreneurial Motives), the remaining 7.2% is explained by other variables not included in the regression model.

*Simultaneous Test (F-Test)*

The simultaneous effect test is used to determine whether the independent variables jointly or simultaneously affect the dependent variable. The simultaneous test results can be seen in Table 18 below.

**Table 18. Result of F-test ANOVA<sup>a</sup>**

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	644.429	5	128.886	88.158	.000 <sup>b</sup>
Residual	49.708	34	1.462		
Total	694.137	39			

a. Dependent Variable: BUSINESS PERFORMANCE

b. Predictors: (Constant), ABSX2X3, Zscore: ENTREPRENEURIAL MOTIVES, ABSX1X3, Zscore: ENTREPRENEURIAL SPIRIT, Zscore: TRAINING

Based on Table 18 above, the results of the F-test carried out in this study found that joint training, entrepreneurial motives, entrepreneurial spirit had a

significant effect on business performance where the value of  $F_{count} < F_{table}$  ( $0.00 < 0.05$ ).

*Hypothesis Test*

<b>Impact Factor:</b>	<b>ISRA (India) = 6.317</b>	<b>SIS (USA) = 0.912</b>	<b>ICV (Poland) = 6.630</b>
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	<b>GIF (Australia) = 0.564</b>	<b>ESJI (KZ) = 8.771</b>	<b>IBI (India) = 4.260</b>
	<b>JIF = 1.500</b>	<b>SJIF (Morocco) = 7.184</b>	<b>OAJI (USA) = 0.350</b>

**Table 19. Individual Test Results  
Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Unstandardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	13.359	.322		41.481	.000
Zscore: TRAINING	1.005	.458	.238	2.194	.035
Zscore: ENTREPRENEURIAL MOTIVES	.189	.429	.045	.440	.663
Zscore: ENTREPRENEURIAL SPIRIT	2.996	.318	.710	9.433	.000
ABSX1X3	1.244	.550	.130	2.263	.030
ABSX2X3	.342	.518	.039	.659	.514

Hypothesis test 1: The Effect of Training on Business Performance

Based on the research results shown in Table 5.24, training has a significant effect on business performance at sig 0.03. It can be concluded that Ha is accepted, and Ho is rejected. It means that the hypothesis is proven.

Hypothesis test 2: The Effect of Entrepreneurial Motive on Business Performance

The results showed entrepreneurial motives affect business performance but not significant, where the account value > 0.05, namely 0.663 > 0.05. In this case, the hypothesis can be proven where Ho is accepted and Ha is rejected.

Testing Hypothesis 3: The effect of Entrepreneurial Spirit on Business Performance.

In Table 5.24. shows that the entrepreneurial spirit has a significant effect on business performance where the sig. value < 0.05 (0.00 < 0.05) means that Ha is accepted and Ho is rejected. Then, it can be concluded that the hypothesis is proven.

Testing Hypothesis 4: the effect of training on the businesses performance of creative industry utilizing rattan as raw material in Pekanbaru which is moderated by the entrepreneurial spirit.

In Table 5.24. shows that training has a significant effect on the businesses performance of creative industry utilizing rattan as raw material in Pekanbaru which is moderated by entrepreneurial spirit where the sig. value < 0.05 (0.03 < 0.05) means that Ha is accepted and Ho is rejected. Then, it can be concluded that the hypothesis is proven.

Hypothesis Testing 5: the effect of entrepreneurial motives on the businesses performance of creative industry utilizing rattan as raw material in Pekanbaru which is moderated by the entrepreneurial spirit.

In Table 5.24. shows that entrepreneurial motives have no significant effect on the businesses performance of creative industry utilizing rattan as in Pekanbaru, which is moderated by the entrepreneurial spirit. It is where the sig. value < 0.05 (0.0514 < 0.05)

means that Ha is rejected and Ho is accepted. Then, it can be concluded that the hypothesis is unproven.

### Discussion

#### The Effect of Training on Business Performance

The results of statistical tests prove that training has a significant effect on business performance. High or low business performance can be seen from several indicators, such as: business growth, profit increase, product sales on target, an increase in number of employees, increased consumers buying these products. Based on respondents' responses to business performance, the average business performance is not optimal. This is the condition for each business actor. It seems that what the experts state is proven in this study, namely training can affect business performance. Looking at the answers of respondents when asked about training indicators, on average the answers are good although some of these business actors still say that the training followed can increase the production of their rattan products. In addition, the rate of work accidents should be reduced after participating in special training for making rattan products. However, in reality, this is not the case. In the descriptive analysis, it can be seen that the answers of respondents with the lowest scores are indicators of training improvement. In fact, only a few answered strongly agree. It means that many actors of business are not oriented towards improving actually very useful training for increasing the quality and variety of products as well as knowledge about business management.

Training can affect business performance very much supported by the results of research in other handicraft industries. So many benefits can be obtained by participating in training such as increasing productivity, reducing the number and cost of work accidents, optimal financial management, increasing awareness of new technology, all of which are of course highly expected by every business actor. However, they are very concerned about the lack of

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these business actors to attend the training they actually need. Paying attention to the reality among business actors who are less oriented towards increasing skills, and enriching new skills and mastering other aspects needed in managing a business, can already be linked to the acquisition of business performance they have initiated for a long time. In addition, statistically, it has proven that training has a significant effect on business performance. It means that if the training is not enough, the business performance will not be optimal. According to the theory put forward by many experts such as Mathis (2006); Desler (2010), which basically states that training will improve one's skills and knowledge, if so, training will certainly be able to improve one's performance and business performance.

### The Effect of Entrepreneurial Motives on Business Performance

The results of statistical tests show that entrepreneurial motives affect business performance but not significantly. This result can be explained that there is still low motive or motivation within these business actors, thus describing the lack of seriousness and uncertainty about the rattan business being run. If so, it can be believed that business performance will be difficult to be improved. Based on the recapitulation of respondents' answers, it turns out that the business performance of these business actors has not been optimal. Moreover, when paying attention to respondents' answers related to entrepreneurial motives, it turns out that it is still far from what was expected. Although each indicator asked, if the answer is averaged, it shows a good value, there are even indicators with very high scores based on the rank value determined in this study, which is related to the desire for this business to be accepted by the community.

However, the desire without enthusiasm to make it happen through various consumer-oriented efforts is certainly meaningless. There are many ways that can be done to attract consumers' attention to this rattan-based product. If business actors are creative and continue to innovate on the products produced, of course, consumers will pay attention and want to buy. To be able to create and innovate requires a strong motive or encouragement in the rattan business actors. However, it turns out that the entrepreneurial motive among these business actors is still lacking, and it can be proven by looking at the business performance that is not optimal and statistically appears to have an effect but not significant.

### The Effect of Entrepreneurial Motives on Business Performance

The results of statistical tests prove that Entrepreneurial Spirit has a significant effect on business performance. The entrepreneurial spirit represents a spirit of independence to seek a source of

income by launching a business or channeling one's creativity to become a land for income. It is genuinely what business actors have, so that they move to pursue this rattan business. The higher the entrepreneurial spirit that can be seen from the existence of this entrepreneurial spirit, it is believed that it can improve business performance.

From the recapitulation of respondents' answers, on average, it can be stated that entrepreneurs possess an excellent entrepreneurial spirit. It is evidenced by the establishment of the rattan business according to their skills. Experts say that if someone possesses an excellent entrepreneurial spirit, it can improve business performance. However, when looking at the business performance as the results of this study that are not optimal, there are doubts about the entrepreneurial spirit possessed by these entrepreneurs. The diversity of responses from the recapitulation of respondents' answers shows that not all entrepreneurs possess a distinctly excellent entrepreneurial spirit. It means the entrepreneurial spirit is high but does not pay attention to many things related to his business such as attention to the uniqueness of the product, looking at the virtues of technology that should be the concern of a business actor for the continuity of his business.

### The Effect of Training on Business Performance Moderated by Entrepreneurial Spirit

Based on the test results, it proves that training causes a significant effect on business performance, moderated by the entrepreneurial spirit. The results of this test can convince us the training followed will make business performance increase because the training followed will increase one's skills and knowledge. Furthermore, if someone possesses an entrepreneurial spirit, which can strengthen one's performance achievements, of course, she/he has an impact on improving business performance.

If entrepreneurial spirit, which is a spirit of independence, is owned by business actors, it is believed to be able to bring success to the business being run. To grow the entrepreneurial spirit, it is actually not difficult. Start with the intention and belief in doing business, enthusiastic about seeing opportunities, willing to learn from other people's success stories, focus on entrepreneurship, learning to improve selling ability, things like that if paid attention will make a person able to develop his business quickly. In accordance with the results of this study, the entrepreneurial spirit can mediate the effect of training on business performance.

### The Effect of Entrepreneurial Motives on Entrepreneurial Spirit Moderated Business Performance

Based on the test, the results show the entrepreneurial motive has an effect on business performance, but the entrepreneurial spirit cannot be

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moderated. Why is that, of course, because motive alone is not enough to produce optimal work, even though one's motive is quite clear. Motive is an impulse in humans arising because of a need to be fulfilled. Everyone will have high motives for the hopes they want to realize. However, motive alone is insufficient to realize these expectations or to fulfill the intended needs. The motive must be accompanied by an entrepreneurial spirit, so that business performance can continue increasing. The entrepreneurial spirit describes the existence of independence in a person in deciding the direction of a business and is always able to show high creativity, persistence and not giving up easily found in the entrepreneurial spirit.

The study results show there are weaknesses in the entrepreneurial motives and spirit of business actors, even though both the motive, and the entrepreneurial spirit are both needed by entrepreneurs to improve their business performance. If the question is, which is more important between the entrepreneurial motive and the entrepreneurial spirit, it is felt that both are important and even very important. Many previous research results prove there is a relationship between motive and the increase of business performance, as well as between entrepreneurial spirit and the increase of business performance. In addition, when it is questioned which is more needed between the two, of course, both are very much needed because the goal is both to be able to improve business performance. It is just the orientation of the motivation is different.

One of the entrepreneurial motives is circumstances, while the entrepreneurial spirit is determination, enthusiasm, in which there is effort, courage to try, willing to learn and ambition to achieve success. If we look closely, the level of success will be obtained quickly when a person has an entrepreneurial spirit. It is even though there is some evidence that conditions compel her/him or motivate her/him to work hard to meet his/her need. However, to be precise, the two things, both entrepreneurial motives and entrepreneurial spirit, must be shared by a business actor, so that business performance can continue increasing.

### Conclusions And Suggestions

#### Conclusions

1. The average business performance among business actors of the handicraft utilizing rattan as raw material has not shown any improvement. It can be seen from the absence of an increase in the number of employees illustrating that there is not much work to be done due to low sales and orders. Another condition can also be seen from the operating profit which did not increase.

2. The results of the hypothesis 1 test of training has a significant effect on business performance. Based on the recapitulation of respondents' answers, there are still those who do not feel the benefits of the training followed by the five indicators asked, namely Business Development, An Increase in Welfare, Recognition of Business, Performance Oriented and Achieving Competitive Advantage.
3. The results of the hypothesis 2 test of entrepreneurial motives affect business performance but not significantly, meaning that entrepreneurial motives are not strong enough to encourage the increase of business performance.
4. The results of the hypothesis 3 test of the entrepreneurial spirit have a significant effect on business performance. The entrepreneurial spirit needs to be improved so that business actors are more creative in producing unique products and are technology-oriented.
5. The results of the hypothesis 4 test of training has a significant effect on business performance moderated by the entrepreneurial spirit. The training followed had an impact on business performance and was strengthened by an entrepreneurial spirit.
6. The results of the hypothesis 5 test of the entrepreneurial motives have no significant effect on business performance moderated by the entrepreneurial spirit. It means entrepreneurial motives do not have an impact on business performance without an entrepreneurial spirit.

#### Suggestions

1. To improve business performance, business actors should focus on increasing sales. By participating in the training, it seeks to grow an entrepreneurial spirit and be committed to existing entrepreneurial motives.
2. Training needs to be improved, and the training needed is more directed at how to make unique products with good quality, and learning to be able to work more discipline in using equipment, so that work accidents can be avoided.
3. The existing and various entrepreneurial motives for each business actor should be able to be an encouragement in building a more serious business; the key is hard work.
4. Cultivating an entrepreneurial spirit can be done by learning from the success of other businesses, learning to love the challenges of doing business, focusing on doing business and most importantly starting a business with the intention and belief.

#### Conflict of Interest

The authors declare no conflict of interest with this research paper.

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Article



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## SELECTION OF THE DESIGN OF PRODUCTION WELLS FOR THE DEVELOPMENT OF MULTI-LAYER DEPOSITS BY DUAL COMPLETION OPERATION

**Abstract:** The article considers the choice of an operational well design for the development of multi-layer deposits by simultaneous separate operation. Based on the parameters of reservoir pressures according to the calculations carried out, the corresponding depths for well №200, the values of the equivalents of reservoir pressure gradients were obtained. The developed design of the well is effective for the development of wells by the method of dual completion (DC) with two elevators by pumping and compressor pipes. This work can be applied to drilling operations at multi-layer deposits in order to accelerate the development of deposits.

**Key words:** hydraulic fracturing, well profile, regulations, combined schedule, intermediate column, parallel elevator, rock strength.

**Language:** English

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### Introduction

One of the most important tasks for successful drilling operations in areas with multi-layer productive horizons is a reasonable correct choice and design development for simultaneous and separate operation of wells. The initial data for the design of the well structure are; the purpose of drilling and the purpose of the well, the design horizon and depth of the well, the diameter of the production column, reservoir pressures and hydraulic fracturing pressures

of stratigraphic horizons, methods of completion of the well and its operation, the profile of the well and its characteristics, characteristics of rocks by strength [1, 4, 9].

Data for the calculation (pressure and temperature by depth) of the investigated well №200 on the Northern Goturdepe area, compiled on the basis of data from previously drilled wells №№29, 97, 101 Northern Goturdepe are shown in Table 1.

**Table 1. Pressure and temperature in the section of the well №200 of the Northern Goturdepe area**

Interval, m		Pressure gradient				Temperature at the end of the interval, °C
		formation		pore		
from (top)	up to (bottom)	kgf/cm <sup>2</sup> per m		kgf/cm <sup>2</sup> per m		
		from (top)	up to (bottom)	from (top)	up to (bottom)	
0	500	0,00	0,105	0,00	0,105	32
500	1170	0,105	0,110	0,105	0,110	44

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1170	1500	0,110	0,112	0,110	0,112	51
1500	2330	0,112	0,115	0,112	0,115	66
2330	2460	0,135	0,135	0,135	0,135	69
2460	2510	0,115	0,115	0,115	0,115	70
2510	2610	0,135	0,135	0,135	0,135	72
2610	2830	0,115	0,120	0,115	0,120	76
2830	2940	0,120	0,123	0,120	0,123	78
2940	3200	0,123	0,125	0,123	0,125	83
3200	3600	0,125	0,125	0,125	0,125	90
3600	4180	0,125	0,126	0,125	0,126	101
4180	4300	0,126	0,130	0,126	0,130	104
4300	4650	0,130	0,135	0,130	0,135	110
4650	4800	0,135	0,155	0,135	0,155	113
4800	4900	0,155	0,160	0,155	0,160	115

The development of the well design begins with the solution of two problems; the determination by calculation of the nominal diameters of the casing strings and the diameters of the rock-breaking tool.

When choosing and justifying the design of the well №200 Northern Goturdepe, the requirements of the "Safety Rules in the Oil and Gas Industry", the Regulations for calculating intermediate columns when Drilling wells in the oil and gas areas of the

western part of Turkmenistan were taken into account and geological and technical information on previously drilled wells in the Northern Goturdepe area was used.

Based on the parameters of reservoir pressures at the corresponding depths, calculations were made for well № 200, the values of the equivalents of reservoir pressure gradients. The results obtained are shown in Table 2.

**Table 2. Calculated values of hydraulic fracturing pressures, gradients of reservoir pressure, hydraulic fracturing of rocks and the density of drilling fluid at well № 200 Northern Goturdepe**

Interval, m		Hydraulic fracturing pressure		Pressure gradient				Temperature at the end of the interval, °C
				Reservoir pressure		hydraulic fracturing of rocks		
from (top)	up to (bottom)	kgf/cm <sup>2</sup> per m		kgf/cm <sup>2</sup> per m		kgf/cm <sup>2</sup> per m		
		from (top)	up to (bottom)	from (top)	up to (bottom)	from (top)	up to (bottom)	
0	500	49,0	76	0,00	1,05	1,49	1,52	1,26
500	1170	76	182,5	1,05	1,10	1,52	1,56	1,26
1170	1500	182,5	235,5	1,10	1,12	1,56	1,57	1,26
1500	2330	235,5	370,5	1,12	1,15	1,57	1,59	1,26-1,45
2330	2460	370,5	423,1	1,35	1,35	1,59	1,72	1,45
2460	2510	423,1	399,1	1,15	1,15	1,72	1,59	1,45
2510	2610	431,7	449,0	1,35	1,35	1,72	1,72	1,45
2610	2830	449,0	458,5	1,15	1,20	1,72	1,62	1,45
2830	2940	458,5	482,1	1,20	1,23	1,62	1,64	1,45
2940	3200	482,1	608,0	1,23	1,25	1,64	1,90	1,45
3200	3600	608,0	684,0	1,25	1,25	1,90	1,90	1,45
3600	4180	684,0	794,2	1,25	1,26	1,90	1,90	1,45
4180	4300	794,2	825,6	1,26	1,30	1,90	1,92	1,45
4300	4650	825,6	906,7	1,30	1,35	1,92	1,95	1,45
4650	4800	906,7	984,0	1,35	1,55	1,95	2,05	1,62
4800	4900	984,0	1014,3	1,55	1,60	2,05	2,07	1,68

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In order to conduct research and select the design of wells for simultaneous operation of several productive formations on one well, a thorough study of previously drilled wells was carried out and new types of well designs were selected with a full analysis of geological and geophysical materials.

The length of the conductor and the height of its cementing are chosen in such a way that it is strong enough and can reliably withstand the forces that may arise when the preventer is closed under the influence of the pressure of productive layers. The possibility of a gas breakthrough from the well through the annular space or through cracks connecting the borehole to the surface should also be excluded.

To select the number of intermediate technical columns and the depth of their descent, a combined graph of changes in reservoir pressure, hydraulic fracturing pressure and hydrostatic pressure of the drilling fluid column is constructed in the coordinates "depth is equivalent to the pressure gradient".

The choice of the well design was carried out in accordance with the intervals of compatibility of the well section according to the mining and geological drilling conditions, based on the forecast curves of reservoir pressure of rock rupture, and the following design was justified.

- the shaft direction Ø720 mm descended to a depth of 10m, is fixed with butobeton.

- the elongated direction of Ø 530 mm descended to a depth of 30m, in order to overlap unstable, sandy-clay deposits and prevent erosion of the wellhead when drilling under the conductor. The height of the cement lifting is up to the wellhead.

The conductor Ø426 mm descended to a depth of 592 m, provides overlap of the upper part of unstable sandy-clay quaternary deposits, isolation of the borehole from hydrostatically connected with the surface waters and installation of anti-blowout equipment.

The technical column Ø324 mm descended to a depth of 1998 meters to cover the swelling and collapse of "black clays", is equipped with anti-blowout equipment and provides effective well management in case of possible manifestations. The height of the cement rise behind the column is up to the wellhead.

The descent of a technical column with a diameter of Ø244.5 mm was carried out to a depth of

4189 meters, into the roofing part of the productive horizon IX d + e with an adjustment according to logging data. The shoe of the technical column is installed in clay deposits. The casing Ø244.5 mm column was selected according to calculations for the perception of all loads arising during drilling and operation of wells. The height of the cement rise behind the column is up to the wellhead.

The descent of the operational shank Ø139.7 mm was carried out to a depth of 4332 meters (the length of the shank 4170-4332 meters), with the installation of a suspension device for 50-100 meters inside the casing Ø244.5 mm.

The developed design of wells with two elevators for the EPR of several horizons is shown in the figure. Based on the geological results and according to calculations with the compatibility of drilling conditions due to the presence of four attachment zones, the design of the wells under study is represented by three casing columns, and the bottom part by a countersunk column in the form of a shank.

A special difference between the design proposed by us for scientific testing from the previously used one is an increase in the depth of descent of the second technical column for fixing the upper productive horizons, and the lower horizons with casing columns with a diameter of Ø139.7 mm or special filters in the form of a shank [2, 5, 6, 7].

The essence of this technology lies in the fact that in the operational column (mainly an intermediate column of Ø244.5 mm), for the purpose of descent, two parallel tubing elevators, differing in suspension height - short and long. At the same time, productive horizons are separated by a packer device, which ensures their separate operation and accounting of production by the well for each operational object [3, 8, 10].

At well №200 Northern Goturdepe, in order to DC several productive horizons, the depth of descent of the second technical column was increased by Ø244.5 mm for fixing the upper productive horizons, and the lower horizons by casing columns Ø139.7 mm with cementing in the form of a shank [11].

During the development of well №200 by the DC method, a large inflow of oil was obtained, the results of the studies are shown in Table 3.

**Table 3. Data on perforations and indications of studies during the development of well № 200 of the Northern Goturdepe field**

Object designation, type of perforator, number of holes	Distance of the test object, (m)	Age, artificial depth, (m)	Development results
I PKO -102 800	4046-4052 4057-4067 4071-4077	Pack IX	I- lift tubing received oil inflow $D_{\text{connect. pipe}} = 22\text{mm}$ , $P_{\text{work}} = 38 \text{ atm}$ . $Q_{\text{oil}} = 157,3 \text{ m}^3/\text{day}$ .



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	4079-4085 4086-4092 4094-4104 4122-4128 4134-4140		
PKO -89 545 Enerjet -43 273	4192-4198 4204-4216 4288-4292	Lower red color NK-1, NK-2	II - lift tubing received oil inflow $D_{connect\ pipe} = 15mm$ , $P_{work} = 38\ atm.$ $Q_{oil} = 127,4\ m^3/day$

According to the well schemes, the completion in the form of a shank with full cementation in productive zones has the following advantages:

- to use the development of the technology of exploration, cementing, secondary opening and development of the well;

- to ensure the overlap of the zones of reservoir water intake and the tightness of the inclined part of the hole;

- to operate overlapping collectors.

The figure shows the design of well № 200 on the Northern Goturdepe field with a two-lift tubing with downhole equipment for DC.

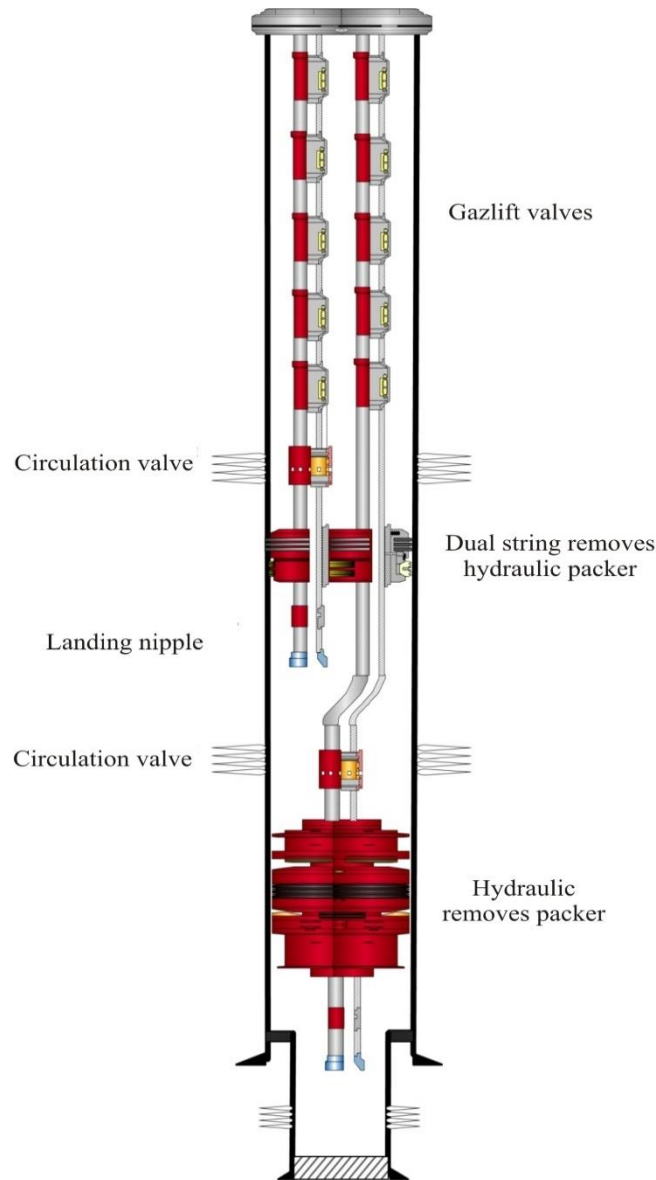


Figure 1. Design of well №200 with a two-lift tubing with downhole equipment for the DC at the North Goturdepe field

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## THE RECIPE FOR THE PREPARATION OF DRILLING FLUIDS FOR DRILLING WELLS IN FIELDS WITH COMPLEX MINING AND GEOLOGICAL CONDITIONS

**Abstract:** The article describes the recipe for the preparation of an oil-emulsion humate-lignosulfonate solution, a complex-inhibited ALKAR-3M system, a solution of a hydrocarbon base of the "Versadril" type and a complex-inhibited CAIR-T system. The author suggests the procedure for replacing the oil-emulsion humate-lignosulfonate solution with the ALKAR-3M drilling fluid, as well as the replacement of the ALKAR-3M solution with a "Versadril" type hydrocarbon base solution. Such a view will be of interest to specialists for successful drilling operations in deep wells of deposits with difficult mining and geological conditions.

**Key words:** defoamer, viscosity, water output, chromepik, clay mixer, chisel, buffer, brine.

**Language:** English

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### Introduction

Preparation of oil-emulsion humate-lignosulfonate solution:

In a clay mixer with a volume of 4 m, water is poured to half the volume and 60 kg of caustic soda (NaOH) is filled in – mixing is carried out for 15-20 minutes, after that 600 kg of water is filled in with periodic scrolling of the blades of the clay mixer and water is added to the upper level. The mixture is mixed for 1-130 hours, after which the reagent is added to the drilling fluid during one circulation cycle. During the first treatment, it is necessary to add 2 clay mixers (8 m<sup>3</sup>) of the coal-alkali reagent (KAR) reagent to 100 m<sup>3</sup> of drilling fluid.

In a clay mixer with a volume of 4 m<sup>3</sup>, water is poured to half the volume and 70-80 kg of caustic soda (NaOH) is filled in – mixing is carried out for 15-20 minutes, after that 700-800 kg of KSSB-2 is filled in with periodic scrolling of the blades of the clay mixer and topping up the water to the upper level. The mixture is mixed for 1 to 130 hours, after which the reagent is released into the drilling fluid during one circulation cycle. During the first treatment, 2 clay

mixers (8 m<sup>3</sup>) of the KSSB-2 reagent must be added to 100 m<sup>3</sup> of drilling fluid.

For 100 m<sup>3</sup> of drilling fluid, it is necessary to add 10 tons of oil and 500 – 700 kg of graphite. Surfactant HT-48 is used in drilling fluid as a defoamer. For 100 m<sup>3</sup> of drilling fluid, it is necessary to add surfactant HT-48-200 – 400 kg. All these reagents are alternately added to the drilling fluid during one circulation cycle, depending on the volume of the drilling fluid being processed, further processing of the oil-emulsion humate-lignosulfonate solution is carried out in order to reduce the viscosity of the solution and water recovery to the set values of the parameters. If the pH of the solution falls below the value, the required amount of NaOH should be introduced into the solution. Preparation and addition of reagents in the future is carried out as needed.

Substitution of an oil-emulsion humate-lignosulfonate solution into a complex-inhibited ALKAR-3M system:

A complex-inhibited ALKAR-3M system is being prepared. 2-2.5 m<sup>3</sup> of seawater is poured into a

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4 m<sup>3</sup> clay mixer, 80-100 kg of chromium is loaded and mixed for 15-20 minutes, 200-250 kg of Portland cement is added, mixed for 1-2 hours, then 100-150 kg of alkali is added, mixed for 20-30 minutes, 500 kg of lignosulfonate is added and 70-100 liters of HT-48 are mixed for 1-2 hours. Sea water is added to the clay mixer to the level of. Everything is mixed for 1-130 hours. After preparation, the complex-inhibited ALKAR-3M system is released into the circulating drilling fluid during one cycle, injected into the drilling fluid in an amount of 10-15% by volume of the solution. The cooking time is 3-4 hours [1, 5, 6].

For 100 m<sup>3</sup> of drilling fluid, it is necessary to add 10-15 tons of oil and 500 – 700 kg of graphite. All these reagents are alternately added to the drilling fluid during one circulation cycle, depending on the volume of the drilling mud being processed.

The need for further post-treatment of the "weakened" inhibited solution is expedient with an increase in structural and mechanical properties by 10-15%.

The procedure for replacing the inhibited solution of ALKAR-3M with a solution of the hydrocarbon base "Versadril".

To circulate the well with ALKAR-3M solution from the working tank to achieve the minimum acceptable parameters and static shear stress. Lower the chisel to the bottom as the new hydrocarbon solution approaches the chisel. Use large grids on the vibrating screen during replacement and after for 1-2 cycles. Pump a buffer of at least 60-150 m of the borehole. The buffer should be prepared from diesel and VG-69 clay to achieve viscosity or from a ready-made Versadril solution with a higher concentration of VG-69.

Preparation of a hydrocarbon-based solution formulation in field conditions for 1 m<sup>3</sup> of solution:

The required amount of diesel fuel (0.5 m) is poured into one of the tanks, then, with intensive stirring, surfactant emulsifiers - Versamul and Versacoat are introduced through the funnel using a jet of centrifugal pumps and agitators, achieving their complete dissolution. In another container, mineralized water (containing CaCl<sub>2</sub>) of the required activity is prepared. Mineralized water is slowly added to the container with the treated reagent with diesel fuel through the mixer funnel, mixing thoroughly (in addition, you can add dry powder CaCl<sub>2</sub>). Then quicklime (CaO) is introduced, thoroughly mixed for 30-60 minutes and a filtration reducing reagent, Versatrol, is introduced, mixed for 30-60 minutes. In the resulting initial solution, barite is added to the required density and mixed for an hour. Technological parameters of the finished solution are determined.

The necessity is the sequence of reagent input and mechanical mixing of the system. In this regard, constant speed mixers (n = 2000 rpm) should be used

on drilling rigs. and more), and hydraulic and mechanical agitators should be used on the drilling rig.

Before mixing a hydrocarbon-based solution, all measuring tubes where a hydrocarbon-based solution will be prepared must be cleaned of an aqueous solution. After cleaning, it is necessary to start preparing the Versadril solution. It is recommended to have a spare capacity for preparing CaCl<sub>2</sub> brine, as well as to have diesel storage tanks. In order to avoid downtime of the drilling rig, it is necessary to provide the drilling rig with uninterrupted diesel and water [2, 7].

"CAIR-T" (Calcium-potassium-aluminate inhibited solution - thermostabilized) is a composition consisting of inhibitors, stabilizer, heat stabilizer, caustic soda, surfactant and water.

Lignosulfonates - salts of lignosulfonic acids (SSB, KSSB, FHLC), which also have an additional hydrophobic force, are used as a stabilizer and a viscosity reducing agent. However, lignosulfonates cause foaming in the drilling fluid and are not amenable to natural degassing.

Combined surfactants (HT-48) are nitrogenous surfactants in a mixture of polyoxyalkyl block copolymers - ethylene and propylene oxides, and is an active defoamer. The mechanism of defoaming is that HT-48 binds the hydrophobic part of lignosulfonate molecules. In addition, due to the adsorption of HT-48 on clay rocks, adsorbed HT-48 molecules shield the active areas on the surface of clays, preventing their interaction with water.

The role of the heat stabilizer is performed by salts of chromic acid - sodium bichromate (Na<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub>) or potassium (K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub>).

The role of inhibitors is performed by potassium chloride and alkaline hydrolysates of Portland cement, forming acid-potassium chloride and acid-alkaline hydrolysates with sodium or potassium bichromates, which prevent hydration, swelling and disintegration of clay rocks in the zone of moderate and elevated temperatures. The increase in the level of inhibition occurs due to the transfer to a water-soluble state of potassium and calcium compounds present in potassium chloride and Portland cement - in the form of potassium and calcium monochromate.

Acid-base hydrolysates of Portland cement contain water-soluble and insoluble compounds, the mineralogical composition of which includes:

tricalcium silicate - 58,0-62,0%; - 3CaO-SiO<sub>2</sub>+H<sub>2</sub>O+K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub>;

dicalcium silicate - 14,5-18,5%; - 2CaO-SiO<sub>2</sub>+H<sub>2</sub>O+K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub>;

tricalcium aluminate - 4,0-6,0% - Ca<sub>3</sub>Al<sub>2</sub>O<sub>6</sub>-SiO<sub>2</sub>+H<sub>2</sub>O+K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub>;

tetracalcium aluminoferrite - 13,0-15,0%; - Ca<sub>4</sub>(Al<sub>2</sub>O<sub>6</sub>)(Fe<sub>2</sub>O<sub>3</sub>) + H<sub>2</sub>O+K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub>.

These water-soluble acidic compounds are in dissociated form and are effective anionic clay inhibitors.

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Potassium acid chloride (KCl) enhances the inhibitory effect of the complex additive due to the unique property of the potassium ion. Potassium ion is not hydrated and, therefore, has a minimum size in an aqueous medium. This allows it to penetrate into the interplane space of clays, preventing their hydration and swelling.

The inhibited thermally stabilized complex additive "CAIR-T" can be treated with various types of drilling fluids, including clay ones.

A comparative analysis of the technical solution with the prototype shows that a significant difference between the claimed invention is an increase in the inhibitory effect in the zone of moderate (+61 °C to +100 °C) and elevated (+101 °C and more) temperatures, which affects the parameters of the solution - a decrease in viscosity (due to a decrease in the swelling of clay particles) and static shear stress in one and ten minutes.

When viewing other technical solutions known in this field, the proposed set of essential features that allows achieving a technical result is not found.

Preparation procedures for the inhibitory thermostabilized additive CAIR-T.

The implementation of the method is shown by the example of processing clay drilling fluid in field conditions. First, a complex inhibitory thermostabilized additive "CAIR-T" is prepared. To

do this, pour 2 - 2.5 m<sup>3</sup> of seawater into a 4 m<sup>3</sup> clay mixer, load 120 kg - 160 kg of chrome powder and mix for 15-20 minutes, add 400 kg - 500 kg of Portland cement - mix for 1-2 hours, then add 160 kg - 200 kg of caustic soda - mix for 20-30 minutes, add 400 kg - 600 kg of lignosulfonate and 40 liters - 80 liters of HT-48. After that, with continuous stirring, 400 kg - 600 kg of potassium chloride is loaded, mixed for 1-2 hours [3,10]. Sea water is added to the clay mixer to the full level. All this is mixed for 1-1.5 hours. After preparation, the complex inhibitory thermostabilized additive "CAIR-T" is released into a circulating clay drilling fluid for one cycle. Injected into clay drilling fluid in an amount of 8% - 15% by volume of the solution. The cooking time is 3-4 hours.

The effectiveness of the complex inhibitory thermostabilized additive "CAIR-T" has been proven by laboratory studies at room temperature (+24 °C) and under thermostatic conditions (+80 °C and +105 °C).

Inhibited system "CAIR-T" (calcium - potassium aluminate inhibited solution) this is a multilateral inhibited system, its application ensures a reduction in the consumption of chemicals and materials, increases the stability of the wall of the borehole zone of the borehole and increases the relief of the hole, bringing it closer to the nominal diameter [4, 8, 9].

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## ENSURING ECONOMIC SECURITY THROUGH BENCHMARKING IN THE CONTEXT OF DIGITALIZATION

**Abstract:** In this paper, the issues and problems posed by digitization in the context of the analysis and evaluation of the economic security of the region under contemporary conditions of the economy are taken into consideration. Definitions are provided for the fundamental ideas and categories pertaining to the economic security of the region. Studies have been conducted on the various methodological approaches to the formation of integral characteristics of regional economic security. When developing forecasting methods, it is important to take into account the requirement to analyze the potential characteristics of the level of economic safety in the future. It is important to take into consideration the indicators in order to ensure that the forecasts that are developed are accurate.

**Key words:** economic security, region, digital technologies, forecasting, judgmental methods, indicator.

**Language:** English

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### Introduction

Active digitization is one of the most important priorities that needs to be addressed in order for Uzbekistan to achieve a high level of economic security. The conveniences that are associated with digital technologies, in addition to the high level of precision that can be achieved in one's calculations when using said technologies, are what drive the relevance of the use of digital technologies across all areas of social and economic activity. Therefore, digital technologies are of critical significance for providing a precise estimation of the level of

economic security and modeling a variety of scenarios for how it can be provided. The widespread application of digital technologies across a wide range of economic fields not only makes it possible to raise the overall level of economic security in the region, but it also makes it possible to develop a comprehensive set of preventative measures aimed at mitigating the adverse effects of a variety of macroeconomic dangers.

**Modern Practice For Evaluating The Level Of Economic Security Of The Region**

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The ability of the territory to ensure sustainability and progressive advance in terms of economic self-sufficiency and integration with the national economic system of the economy despite the credible negative impact of adverse factors (security threats), as well as the ability to bolster resistance to various threats, lessen, and neutralize the effects of those threats, is referred to as the economic security of the region.

The difficulties associated with evaluating and monitoring the level of regional economic security that has been achieved are not caused by an insufficient lack of approaches and concepts; rather, these difficulties are caused by the presence of a large number of developed models within separate aspects of the performance of the modern economy.

In the broadest sense, monitoring economic security can be accomplished through either conducting an all-encompassing evaluation or making a priority selection of one of the economic security components and conducting an in-depth study on that component.

The economic security benchmarks and indicators are a set of parameters that provide an overall description of the state of the economic system. This group of indicators does not apply consistently across all geographic areas. In addition to the significant parameters that were selected, these indicators are meant to evaluate the distinctive qualities of regional economic systems and the potentially risky areas.

Uzbekistan has not yet established a common adopted, statutory methodology (practice) for calculating indicators and their thresholds to analyze the level of economic security of the regional economy. This is despite the fact that the security indicators system is a crucial component in ensuring and improving the economic strength of regional reproduction complexes. Despite this, Uzbekistan has not yet established a common adopted, statutory methodology (practice).

Expert estimation is carried out in order to give quantitative characteristics and qualitative description of the processes that are being analyzed; scenario evaluation and analytics, optimization methods, pattern recognition techniques, game-theoretic methods of multivariate sta.

Utilizing a number of different approaches, each of which has a number of benefits and drawbacks, is required in order to evaluate the level of economic

security that the region possesses. In this context, we can differentiate the following procedures: methods that are based on the calculation and monitoring of key macroeconomic indicators, in addition to the benchmarking of these indicators; Methods based on the indicative analysis; the Delphi approach, which results in ranking regions by threat level; methods assuming the use of relative rate indices based on key macroeconomic indicators and their comparative movements; methods of technical analysis, including multivariate statistical analysis, game theory with nature, and other similar methods; methods using economic tools to assess the negative consequences of security threats through asset losses quantitative assay [3].

Existing methods for determining the economic security of a region include three main groups of indicators that involve: a single index (most often, these are relative values that are determined per capita); decomposition by singling out aggregated groups of primary indicators; assessment of damage (calculating an integral compromise (trade-off) estimation of the socio-economic security of the region); and so on.

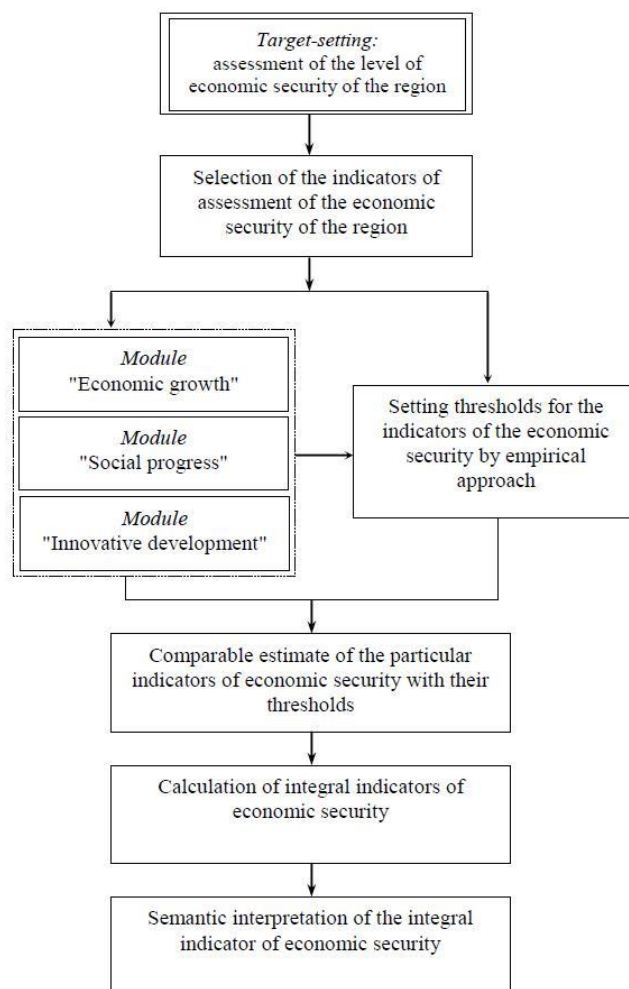
In addition to these, it is necessary to conduct an analysis of the indicators that not only characterize the region that is the subject of the investigation, but also the average values of all universal indicators and, if at all possible, the average values by district, which the region that is the subject of the investigation is a part of.

The following are some suggestions that can be made based on contemporary methodological approaches to the integrated assessment of regional economic security: clarification of the objectives of the ongoing research; selection of estimated figures that make it possible to give account of economic security by the main substantive modules (most of the time, these are characteristics of economic, social, and innovative development); and establishing cutoff points for each individual indicator of the region's economic health; the determination of the integrated index of economic security; determining the extent to which individual indicators contribute to the formation of the overall indicator of the region's economic security; interpretation of the integral indicator of the economic security of the region based on the results of the study in terms of its semantic meaning ("Fig. 1").



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**Fig. 1. Methodological approaches to the calculation of the integral indicator of economic security of social and economic systems.**

There have been a significant number of different indicators developed to characterize the level of economic security, as well as approaches to determining how they should be determined. This is because there are a variety of factors that influence the level of economic security, as well as a multilevel system for measuring it. It is difficult to find a solution to this problem because there is no system in place that provides the opportunity to categorize the existing indicators through the lens of economic security (as a distinct category).

The following group of fundamental indicators [4] is used to characterize the degree to which a particular region enjoys a secure economic status:

- Level of economic security and sustainability of business entities operating in the region;
- Level of economic security of the population in the region.
- Stability of functioning and development of the regional capital and insurance market.

An insightful analysis (overview) of the existing methodologies of foreign scientists in this field makes

it possible to develop an integrated approach to the selection of quantitative characteristics of the economic security of the region. This requires an analysis of the following strands of research, covering the most important areas of the regional economy and taking into account the specific features of its current state and development. In order to develop this approach, it is necessary to conduct an insightful analysis (overview) of the existing methodologies of foreign scientists in this field.

Within the context of this strategy, the following components are to be distinguished as distinct modules:

- Economic advancement: GRP per capita, billion USD
- Rate of inflation on an annual basis, expressed as a percentage of GRP; amount of fixed assets created; expressed as a percentage of foreign trade surplus; expressed as a percentage of the region's consolidated budget balance.
- Social progress: the ratio of the average income to the average cost of living, in times; the ratio of the

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average pension to the average wage, in percent; the unemployment rate calculated using the ILO methodology, in percent; life expectancy at birth, in years The standard square meters of living space allocated to each individual in a home;

The percentage of total funds devoted to social policy initiatives like health care, education, and welfare.

- Innovative development: the share of innovative products that were shipped as a percentage of the total number of industrial products that were shipped, in percent;

Number of people working in R&D as a percentage of the total employed population per 10 thousand; percentage of total internal expenditures devoted to R&D as a proportion of GRP.

### Fundamentals Of Forecasting The Level Of Regional Economic Security

Formalized methods are used almost exclusively when forecasting the level of economic security. These methods are primarily founded on mathematical theories, which improves the dependability and accuracy of forecasts while also significantly reducing the amount of time needed to ensure information processing and outcome evaluation.

The extrapolation method involves applying the tendency for the development of the economic process that is unique to the base period to the forecast period. This method is based on the assumption that the conditions that were previously present for the development of the process will continue to exist in the future. In order to apply this method, you will need information on the degree to which the development trends of the process (phenomenon, object) will be sustainable over a period of time that is two to three times longer than the forecast period. The following items are included in the order of activities that make up the process of extrapolation:

- A precise articulation of the issue at hand, the formation of a hypothesis regarding the potential courses of action that might be taken in the development of the anticipated process, an examination of the factors that contribute to or impede the growth of this process, as well as the establishment of the required extrapolation and the duration of its validation;

- The selection of a set of parameters, the unification of various units of measurement that relate to each parameter on its own,

- The collection and compilation of quantitative data, as well as an analysis of the consistency and similarity of those data;

- The identification of patterns or indications of change in the parameters that are the focus of the research through the use of statistical analysis and the extrapolation of data in a direct fashion.

The most general form of the extrapolation operation can be represented as the process of

determining the value of a function, which is as follows:

$$Y_i + L = F(Y_i \times L)$$

where  $Y_i + L$  stands for extrapolated level value;

$L$  is a pre-emption period;

$Y_i$  stands for the level taken as an extrapolation base

The use of the extrapolation method is distinguished by the production of reliable results in the prediction of specific processes (phenomena, objects) for a period of between five and seven years.

The accuracy of the forecast will improve provided that the minimum error value is determined by the disparity between the value that was predicted and the value that was actually observed for the variable that was being investigated.

Due to the fact that the actual value of the predicted indicator will not be known until some point in the future, the primary challenge consists of calculating the forecast error. As a consequence, the procedures for determining the accuracy of a fait accompli (also known as a posteriori) do not have any practical value because they are merely a statement of the facts. For a forecast to be developed, its accuracy must first be pre-evaluated (a priori) even though the actual value of the indicator being predicted has not yet been determined.

To estimate the forecast accuracy, the calculation of the root mean square error (RMSE) of prediction is made according to the formula:

$$\bar{S}_{RMSE} = \sqrt{\sum \frac{(y_i^{obs} - y_i^{mod})^2}{n}}$$

The correlation coefficient between the forecast (model output) and observed values of the variable is used as a comparative indicator of forecast accuracy, which is calculated using the following formula:

$$r_{y^{act}, y^{pr}} = \frac{\sum (y_i^{pr} - \bar{y}_i^{pr}) \cdot (y_i^{act} - \bar{y}_i^{act})}{\sqrt{\sum (y_i^{pr} - \bar{y}_i^{pr})^2 \cdot \sum (y_i^{act} - \bar{y}_i^{act})^2}}$$

When using this coefficient to assess the accuracy of forecasting the level of economic security, it is necessary to take into account that the pair correlation coefficient, by its nature, describes a linear relationship between two variables and reflects only the relationship between the time series of observed (true) values and the series of forecast (modelled) values of the indicators under investigation. In addition, even if the correlation coefficient reaches a value of 1, this does not mean a complete coincidence of actual (observed) values and forecast estimates, but indicates only the presence of a linear relationship between the time series of modelled and observed values of the indicator.

One of the indicators of the accuracy of statistical forecasts is the Theil Inequality Coefficient (IC), which was proposed by G. Theil and can be calculated using the formula:

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$$IC = \sqrt{\frac{\sum (y_t^{act} - y_t^{pred})^2}{\sum (y_t^{act} - \bar{y}_t^{act})^2}}$$

IC = 0 indicates that the model predictions are as accurate as the mean of the observed data (actual values).

Furthermore, the forecast accuracy can be estimated by the value of the confidence band for a specified probability of its implementation, and accuracy means a quantitative estimator of the probability of forecast implementation within the specified confidence band. Thus, the accuracy of the forecast can be expressed through the probability limits of the actual magnitude of the predicted value. Therefore, possessing economics and statistics tools for predicting potential threats, regional authorities taking control of the social and economic systems have the opportunity to develop a comprehensive set

of preventive measures that will ensure the business continuity of regional reproductive systems.

### Conclusion

The application of digital technologies in the modern context is one of the most promising techniques for improving management systems at regional levels. This technique ensures the following results: improving the manageability of regional reproduction systems and the national economic system, and creating uniform, valid methods of assessing the level of economic security of regional economic systems. In the grand scheme of things, this makes it possible to form a common base of business insights that can be used for making justified managerial solutions, obtaining objective information on the performance results of regional authorities, which provides for more effective controlling.

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## ANALYTICAL AND COMPUTER APPROACHES TO SOLVING QUADRATIC EQUATIONS IN A RURAL GENERAL EDUCATION SCHOOL (FOR EXAMPLE ASKINO SECONDARY SCHOOL №1 REPUBLIC OF BASHKORTOSTAN)

**Abstract:** A detailed analysis of the topic "Quadratics Equations" of author's algebra textbooks for a high school course was carried out. All mathematical concepts related to the further preparation of 9th grade graduates for the final exam in the subject "Algebra" are considered in detail. Methods and techniques for solving quadratic equations are given, including well-known transformation formulas. Students are offered various options for solving quadratic equations, including Vieta's theorem. For the possible solution of quadratic equations of any degree of complexity within the general education school, a universal program has been developed in the programming language Pascal.ABC.NET. A computer experiment was carried out to find the roots of a quadratic equation using known coefficients and the formula for finding the discriminant. The program allows students to get acquainted with the listing and launch protocols. As a result, when preparing for the final exam in algebra, graduates of rural general education schools can apply not only analytical, but also computer-based approaches.

**Key words:** equation, middle school, algebra, mathematics, rural school, basic state exam, quadratic equation, discriminant, Vieta's theorem, Pascal programming language, biquadratic equation, PascalABC, algorithmization, programming, education.

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### Introduction

UDC 332.12

Equations in the school course of algebra occupy one of the leading places in any educational and

methodological set. Much more time is devoted to their study than to any other topic of the school mathematics course, no matter where the training takes place, in a large city or a rural secondary school [1].

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Quadratic equations begin to be studied already in the second half of the 8th grade, according to the chosen school curriculum and the calendar-thematic planning of the subject teacher based on the author's textbook.

Students begin to study this topic, having already accumulated some experience, as well as owning a fairly large stock of algebraic, geometric and general mathematical representations, concepts and skills.

When studying and further consolidating the material on this topic, the ability to solve quadratic equations [2] and the simplest rational equations [3] by a certain method, as well as apply them to solving problems, is developed.

This contributes to the understanding of such concepts as the quadratic equation, the incomplete quadratic equation [4], the reduced quadratic equation [5], the derivation of the discriminant formula [6] and the roots of the quadratic equation [7], the Vieta theorem [8], and the inverse her, acquaintance with fractional rational equations [9], as well as with various methods of solution.

During the study, there is an understanding that the quadratic equation is an apparatus for solving many different problems of mathematics, as well as all kinds of related fields of knowledge and interdisciplinary disciplines, for example, computer science and ICT [10].

However, students of rural general education schools still experience difficulties in studying this topic in the course of a secondary general education school.

### 2. The purpose of the study.

In this regard, the purpose of this work is to analyze and compare algebra textbooks by different authors on the topic "*Quadratic Equations*", as well as to conduct a computer experiment to find the roots of the reduced quadratic equation in the environment of the school programming language Pascal on the basis of the rural secondary school "*Askino Secondary School №1 Republic of Bashkortostan*" [11]. The topic is relevant not only for students of middle and high school education, but also for subject teachers when preparing lessons on this topic, as well as for the final exam in algebra.

### 3. A brief analysis of author's textbooks and methods for solving the given quadratic equation with the indicated coefficients.

**3.1. Analysis of the author's textbook №1.** Let us consider some features of solving quadratic equations according to the algebra textbook for grade 8, edited by the authors [12], and provided for by the Federal State Educational Standard [13].

The study of the topic "*Quadratic Equations*" begins with the item "*Incomplete Quadratic Equations*". Here the concepts of a quadratic equation, a reduced quadratic equation, a non-complete

quadratic equation are introduced, the names of the coefficients  $a$ ,  $b$  and  $c$  in an equation of the form  $ax^2 + bx + c = 0$ , where  $a \neq 0$ , are given, and are indicated in various quadratic equations.

The tasks systematize the methods known to students for solving incomplete quadratic equations, which are directly applied in practice when solving relevant examples, as well as when faced with similar problems in subjects of the natural science cycle (geometry, physics, chemistry, biology, astronomy).

We have found that a fundamentally new step for students is the solution of word problems using incomplete quadratic equations. When performing exercises, they are convinced of the importance of the formed skills. Here, for the first time, students encounter a situation where one of the found roots of the equation does not correspond to the meaning of the problem. Of course, for many students it is absurd and strange.

The next paragraph of the textbook "*Formula of the roots of a quadratic equation*" is devoted to general quadratic equations. First, the solution of the complete quadratic equation with numerical coefficients is considered. Further, all calculations are repeated for an equation of the form  $ax^2 + bx + c = 0$  with letter coefficients  $a$ ,  $b$  and  $c$  that are different from zero, and a general formula for the roots is derived. Students master the ability to solve quadratic equations using the appropriate sequence of steps:

(1) calculate the discriminant of the quadratic equation by the formula  $D = b^2 - 4ac$ ;

$$(2) \text{ when } D > 0 \quad x_1 = \frac{-b - \sqrt{D}}{2a}, \quad x_2 = \frac{-b + \sqrt{D}}{2a};$$

$$(3) \text{ when } D = 0 \quad x_{1,2} = -\frac{b}{2a};$$

(4) when it is concluded that there are no roots.

From the general formula for the roots of a quadratic equation, we derive the formula for the roots of the quadratic equation  $ax^2 + 2kx + c = 0$  with an even second coefficient.

It should be noted that the ability to solve quadratic equations using the general formula of the roots or the formula of the roots of a quadratic equation with an even second coefficient is one of the most important skills formed in the course of algebra.

The attention of students is drawn to the fact that when solving quadratic equations using the general formula for the roots of a quadratic equation or the formula for the roots of a quadratic equation with an even second coefficient, it is often convenient to simplify the equation by performing some transformations: (1) multiply all terms of the equation by  $-1$  if the first coefficient is negative; (2) get rid of fractional coefficients by multiplying all terms of the equation by a common denominator of fractions; (3) reduce all terms of the equation by the same number, if possible. Much attention is paid to the Vieta

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theorem and its inverse when studying the reduced quadratic equations.

We believe that the positive aspects of this author's textbook can be called a detailed presentation of the theoretical part, competent presentation of the material, analysis of rather complex examples of tasks.

Consider an example of solving a quadratic equation of the form  $8x^2 + 2x - 1 = 0$  with coefficients  $a = 8$ ,  $b = 2$ ,  $c = -1$  from this textbook.

According to the method given in the textbook, we calculate the discriminant of the quadratic equation  $D$ .

$$D = b^2 - 4 \cdot a \cdot c = 2^2 - 4 \cdot 8 \cdot (-1) = 4 + 32 = 36.$$

According to the analysis of the discriminant, we see that  $D > 0$ . Therefore, we can apply the formula for the roots of the quadratic equation and calculate the numerical values.

$$x_{1,2} = \frac{-b \pm \sqrt{D}}{2a},$$

$$x_1 = \frac{-2 + \sqrt{36}}{2 \cdot 8} = \frac{-2 + 6}{16} = \frac{4}{16} = 0,25,$$

$$x_2 = \frac{-2 - \sqrt{36}}{2 \cdot 8} = \frac{-2 - 6}{16} = \frac{-8}{16} = -0,5.$$

Answer:  $x_1 = 0.25$ ,  $x_2 = -0.5$ .

### 3.2. Analysis of the author's textbook №2.

In the following author's textbook [14], the topic of quadratic equations is divided into the following main blocks in accordance with the theoretical material: (1) Practicing basic concepts related to quadratic equations; (2) Incomplete quadratic equations; (3) Complete quadratic equations (an algorithm for solving a quadratic equation using discriminant formulas, finding roots, studying and using Vieta's theorem); (4) Rational equations (algorithm for solving a rational equation; solving rational equations by introducing a new variable, biquadratic equations); (5) Text problems solved with the help of rational equations.

We found that when presenting the material, the following are used: (1) definitions and theorems; (2) examples, comments on solving examples and problems, as well as algorithms for solving equations are analyzed in detail; (3) there are questions for self-examination; (4) as well as at the end of each chapter, the main results and topics of research work are spelled out.

In our opinion, the most positive qualities of the textbook are as follows: (1) accessible and understandable style of presentation; (2) classification of tasks according to three levels of complexity; (3) the presence of drawings and drawings for a visual presentation of theoretical and task material; (4) tasks for repetition. Among the shortcomings, the most significant can be singled out: the material is presented in two books.

It is noteworthy that in the last two author's textbooks [13] and [14] the solution of systems of quadratic parametric equations [15] is considered, which is not observed in the textbooks of other authors.

We solve the reduced quadratic equation of the form  $x^2 + 16x + 63 = 0$  using the theorem converse to Vieta's theorem. Equation coefficient  $a = 1$ ,  $b = 16$ ,  $c = 63$ .

We see that the coefficient  $p = 16$ , the free term  $q = 63$ . So, according to the theorem, the sum of the roots is  $-16$ , and their product is  $63$ . We select such roots  $x_1 = -7$ ,  $x_2 = -9$ . Indeed, the sum  $(x_1 + x_2) = -7 + (-9) = -7 - 9 = -16$ , and the product  $(x_1 \cdot x_2) = (-7) \cdot (-9) = 63$ . Thus, we can say that the roots were chosen correctly.

Answer:  $x_1 = -7$ ,  $x_2 = -9$ .

### 3.3. Analysis of the author's textbook №3.

Finally, in the author's textbook [16], provided for by the Federal State Educational Standard for Basic General Education, the study of the topic begins with the definition of a quadratic equation, a reduced quadratic equation, which are solved by isolating the square of the binomial [17]. Further, the formula of the roots of the quadratic equation, the concept of discriminant, the number of roots of the quadratic equation are proposed.

This manual contains a large number of examples for solving equations by changing the variable [18], that is, reducing to quadratic equations. An entire paragraph is devoted to solving quadratic equations using the second formula (with an even coefficient).

Quite a lot of attention is paid to solving problems on the application of the formula of the roots of a quadratic equation. Then incomplete quadratic equations and Vieta's theorem are considered.

We believe that the topics in this textbook are presented specifically and accurately, there is an impressive amount of tasks for practical use in algebra lessons.

The study of the topic "*Quadratic Equations*" ends with the presentation of the section "*Factorization of a quadratic trinomial*". The authors of the textbook in the section "*For those who are interested*" offer a rather interesting technique for the formulaless solution of a quadratic equation, which, in our opinion, is a kind of alternative to the standard methods of other compilers.

Consider standard examples of solving two quadratic equations from this author's textbook of the form  $x^2 - 12x + 36 = 0$  and  $7x^2 - 25x + 23 = 0$ .

a)  $x^2 - 12x + 36 = 0$ .

Coefficients  $a = 1$ ,  $b = -12$ ,  $c = 36$ .

We calculate the discriminant  $D$  according to the well-known formula:

$$D = b^2 - 4ac = (-12)^2 - 4 \cdot 1 \cdot 36 = 144 - 144 = 0.$$

According to the analysis of the discriminant, we see that  $D = 0$ .

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We apply the formula of the roots of the quadratic equation and calculate the only root:

$$x_{1,2} = \frac{-b \pm \sqrt{D}}{2a},$$

$$x_1 = \frac{12 + \sqrt{0}}{2} = \frac{12}{2} = 6,$$

$$x_2 = \frac{12 - \sqrt{0}}{2} = \frac{12}{2} = 6, \quad x_1 = x_2 = 6.$$

Let us show that the roots of the equation are found correctly. In the equation  $x^2 - 12x + 36 = 0$ , the coefficient  $p = -12$ , and the constant term  $q = 36$ . The sum of the found numbers  $(x_1 + x_2) = 6 + 6 = 12$ , and their product  $(x_1 \cdot x_2) = 6 \cdot 6 = 36$ . Hence, according to the theorem converse to the Vieta theorem, these numbers are the roots of the equation  $x^2 - 12x + 36 = 0$ .

Answer:  $x = 6$ .

b)  $7x^2 - 25x + 23 = 0$ .

Coefficients  $a = 1$ ,  $b = -12$ ,  $c = 36$ .

We also calculate the discriminant  $D$  according to the well-known formula:

$$D = b^2 - 4a = (-25)^2 - 4 \cdot 7 \cdot 23 = 625 - 644 = -19.$$

According to the analysis of the discriminant, we see that  $D < 0$ .

Answer: no roots.

Thus, when comparing all three author's textbooks available in the school library of Askino Secondary School №1 Republic of Bashkortostan, we can make the current conclusion that the material on quadratic equations in all the considered educational and methodological sets is presented in an accessible and clear.

Much attention is paid to both the theoretical and practical parts, because it is important to be able to apply the knowledge gained in solving equations, problems, where fractional rational equations act as mathematical models.

The tasks for all textbook authors are very diverse and are aimed at studying equations, determining the number of solutions, and also finding roots.

#### 4. Computer experiment to find the roots of the reduced quadratic equation.

In order to confirm the correctness of the solution of all the above quadratic equations from different author's algebra textbooks, we developed a program in the school programming language PascalABC.NET [19] to find the roots of the above quadratic equation based on the analysis of the discriminant.

This idea arose on the basis that in the computer science course of the 8th grade of the author's textbook [20], provided for by the Federal State Educational Standard, when programming branching algorithms in the chapter "Fundamentals of Algorithmization", a

compound operator is affected, which allows you to write a program for analysis quadratic equation.

Below is a listing of the program in the specified programming language, taking into account the use of an incomplete conditional branching construct [21], a comment for each line, indicating all the keywords of the language and the "tail" of the fractional part.

```
program Equation; {the name of the program}
uses crt; {connecting the library standard
screen cleaning module}
```

```
var a, b, c : real; {description of variables –
coefficients of the quadratic equation}
```

```
D : real; {variable description – discriminant}
x, x1, x2 : real; {description of variables – roots
of a quadratic equation}
```

```
Begin ClrScr; {program start, clear screen}
writeln ('Solving a quadratic equation');
{comment}
```

```
write ('Enter coefficient a = '); {query coefficient
a}
```

```
readln (a); {reading coefficient a}
write ('Enter coefficient b = '); {query coefficient
b}
```

```
readln (b); {reading coefficient b}
write ('Enter coefficient c = '); {query coefficient
c}
```

```
readln (c); {reading coefficient c}
writeln ('Compute the discriminant D:');
{comment}
```

```
D := (b * b) - (4 * a * c); {discriminant
calculation}
```

```
writeln ('Discriminant D = ', D); {output value}
```

```
If (D < 0) Then writeln ('No roots'); {check
condition for D < 0}
```

```
If (D = 0) Then {check condition for D = 0}
```

```
begin
```

```
x := (-b) / (2 * a); {calculation of the root of the
equation}
```

```
writeln ('Root of equation x = ', x:0:3); {output
value}
```

```
end;
```

```
If (D > 0) Then {check condition for D > 0}
```

```
begin
```

```
x1 := (-b + Sqrt (D)) / (2 * a); {calculation of
the first root of the equation}
```

```
x2 := (-b - Sqrt (D)) / (2 * a); {calculation of the
second root of the equation}
```

```
writeln ('First root x1 = ', x1:0:3); {output first
value}
```

```
writeln ('Second root x2 = ', x2:0:3); {output
second value}
```

```
end;
```

```
End. {end of program}
```

Let's run the program for execution to find the roots of the given quadratic equation, indicated above, by entering the coefficients and receiving the work protocols.

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```
Solving a quadratic equation

Enter coefficient a = 8
Enter coefficient b = 2
Enter coefficient c = -1

Compute the discriminant D:
Discriminant D = 36

First root x1 = 0.250
Second root x2 = -0.500
```

Figure 1 – Protocol №1

```
Solving a quadratic equation

Enter coefficient a = 1
Enter coefficient b = 16
Enter coefficient c = 63

Compute the discriminant D:
Discriminant D = 4

First root x1 = -7.000
Second root x2 = -9.000
```

Figure 2 – Protocol №2

```
Solving a quadratic equation

Enter coefficient a = 1
Enter coefficient b = -12
Enter coefficient c = 36

Compute the discriminant D:
Discriminant D = 0

Root of equation x = 6.000
```

Figure 3 – Protocol №3

```
Solving a quadratic equation

Enter coefficient a = 7
Enter coefficient b = -25
Enter coefficient c = 23

Compute the discriminant D:
Discriminant D = -19

No roots
```

Figure 4 – Protocol №4

Thus, based on the developed program template, we can analyze any quadratic equation, calculate the discriminant by the specified coefficients and, accordingly, its roots.

It should be added that the analytical and computer approaches to solving quadratic equations completely complement each other.

This means that a well-composed analytical (mathematical) model of any of the above author's



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textbooks allows you to develop an algorithm for the correct solution of a quadratic equation.

In turn, the mathematical model smoothly turns into writing a program code in one of the educational programming languages and allows you to conduct a computer experiment even within the framework of a rural general education school, which is very important for students from the periphery.

It is no secret that affordable and high-quality computer equipment is still not available in many rural and village schools.

Therefore, many students are still sitting on their phones, where they work in an installed application for one of the programming languages.

## 5. Conclusion.

Thus, in the course of the analysis of the available 8th grade algebra school textbooks, we identified and settled on the fact that the most optimal for the perception of students in rural schools and the periphery is the author's textbook edited by S.A. Telyakovskiy [12].

We are sure that it is important for 8th grade students to be able to apply both analytical and computer approaches to solving the given quadratic equations, which is the basis for creating a basis in preparation for the main state exam.

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Issue

Article



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## THE ROLE OF VALUES IN PREVENTING IDEOLOGICAL THREAT

**Abstract:** In the article, while conditionally dividing threats into economic, social, political, natural-climatic, ecological, demographic, ideological and military categories, it is appropriate to define all of them under the general name "social threat". Because at the root of all of them are social relations, primarily processes related to human activity

**Key words:** Human, society, social, political, natural-climatic, ecological, demographic, ideological and military Threats, social threat.

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### Introduction

Today, in all regions of the world, the process of globalization has its various effects on socio-cultural phenomena. The non-uniformity of such an impact is closely related to the political, economic, social, informational, spiritual potential and geopolitical factors of the countries of the world. We conditionally divide the threats into economic, social, political, natural-climatic, ecological, demographic, ideological and military categories. It is appropriate to designate it as "social threat". Because at the root of all of them are social relations, primarily processes related to human activity.

"Threat" - (derived from the Arabic word, meaning danger) is a human life activity, in general, which complicates life, relying on its own potential, acceptable for itself for centuries, and at the same time, the protection system aimed at preserving the stability and security of society and during a certain historical period. a socio-political structure that is established and directed towards a specific goal, more precisely, a very negative, unpleasant, unstable situation that occurs in a specific space and time as a result of the introduction of local, territorial, regional and, finally, global negative factors that lead to the weakening of the political basis of the state, and then to its decay consists of political, social and historical situation.

Judging from the definition given above, the word basically refers to a clear and extremely negative, unstable social situation in space and time, formed as a result of various negative influences and factors entering the society and political life and aimed at derailing it. In general, experience testifies that it is appropriate to recognize that regardless of the level of threats to the interests of society, the state, and people, they are almost the same in terms of the impact of the harmful consequences that come from them. At this point, President Shavkat Mirziyoyev said, "It is our main task to prevent our children from falling under the influence of various radical and harmful ideas. We need to continue the work in this regard with new approaches" - he calls everyone to be aware.

In our research, we tried to highlight the negative impact of threats on our national spirituality and the specific aspects of improving individual responsibility in combating them based on Islamic values as the most urgent philosophical problems of today's globalization process.

In the work of the first President Islam Karimov, "High spirituality is an invincible force": "Spiritual threat is, first of all, an ideological threat directed against the life of every person as a free person in the literal sense, regardless of language, religion, belief, and aimed at destroying his spiritual world. , it is necessary to refer to ideological and informational attacks.

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In fact, at a time when the processes of globalization are rapidly progressing, such terrible threats against spirituality serve to attack the roots of our national values, which are directly related to the religion of Islam, which is rooted in ancient universal ideas.

"Consequently, any threat directed against spirituality can become one of the serious threats to ensure the security of the country, its national interests, the future of a healthy generation, and ultimately lead to a crisis in society."

Moral threats are a specific form of moral destruction that is directly carried out from inside or outside a country by various centers of destructive forces for their material and political interests. To achieve their goals, they try to use all kinds of methods, people's spiritual and spiritual feelings, national feelings, socio-economic problems existing in any society, as well as the mass media, the Internet, with mastery, greed, and bias.

Ideological threat - a social political movement, current or political force that expresses its own interests and imposes its ideology on others by means of intimidation and force. Ideological threats are a set of ideological threats that threaten the fate of society, state or people, nation or people, and can lead to tragic consequences. Uzbekistan is not exempt from such threats. In the minds of citizens, this is manifested in the form of political extremism, religious fundamentalism, ethnic and ethnic conflicts, corruption and crime, and ideological threats.

In particular, the idea of re-establishing the medieval Arab caliphate and the ideology of fanatics, who are materially and ideologically supported by the centers of international terrorism and religious extremism, are today a great threat to peace and stability in our region.

Ideological threats tend to form alien ideas, views and goals in the human spiritual world. Today, the following manifestations of ideological threats are manifested: moral corruption, violence, egocentrism, individualism, "mass culture", instilling distrust in the development model of the nation-state, attempts to create inter-ethnic conflicts, poisoning the minds of young people.

The goal is to own the material and spiritual wealth of the developing country. Because ideological threats ultimately bring the state to crisis.

Informational threats aim to poison the human mind and thus create a crowd without identity. Today, informational threats come mainly through the Internet. The current era is a time when ideological processes on the world scale are becoming globalized

to an unprecedented degree. The process of information dissemination is covering the entire Earth. The miracle of the last decade of the 20th century, the creation of the international computer network, i.e. the Internet system, and the acceleration of information exchange processes through it, expands the scope of ideological influence today.

In fact, in the conditions of globalization in the world, the Internet system today remains the main means of ideological influence. This process is occupying the mind of the growing young generation with negative views, causing very serious and dangerous problems in today's society.

For example, using the Internet to poison and harm the individual's mind through destructive ideas, more precisely, to turn the individual's heart and mind into an object of ideological struggle, remains one of the most popular and rapid methods of ideological struggle.

As a result, the individual remains vulnerable to cyber attacks. That is, when we analyze it from a philosophical point of view, the main reason why a person falls into the trap of false information and destructive ideas sent through social networks is the use of advanced methods of influencing him in the field of consciousness, which is stronger in the field of consciousness.

In today's era of globalization, computer technology remains the main target of cyber terrorism from the virtual manifestations of terrorism. The most painful point is that this technique is used as a means of moral intimidation. For this, it is necessary to create art works, movies, theater works, documentaries about their life and activities. If their portraits were in the lobbies of schools, colleges, lyceums, higher education institutions, production enterprises, cultural palaces, libraries, cinema and concert halls, even in metro stations, we would create opportunities for the younger generation to take an example, imitate and aspire.

The First President of our country, Islam Karimov, gave very necessary instructions to creative people about creating the characters of our modern heroes in cinema, television and theaters. But, unfortunately, this task was not completed as expected. Because if our children do not know our national heroes, then they will look for a "hero" from abroad. We don't know whether the "hero" he found is a thief who opens bank safes and steals money, a violent thug who doesn't stop killing people, or a swindler who steals people's money in various modern ways. They say that if we do not educate our children ourselves, "educators" will be found in an instant.

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Article



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## GENDER DISCOURSE IN TEACHING: THEORETICAL BACKGROUND FROM THE POINT OF VIEW OF POST-STRUCTURALISM

**Abstract:** Modern debates about gender-sensitive or gender-oriented teaching have so far only touched on the subject area of physical education in general terms. Current thematic publications on this topic often do not contain any detailed information. This article attempts to give theoretical and didactic impulses in teaching and rethinking the category "gender". Discourses convey knowledge to student subjects in the form of objectified realities. The task of the subject is to find himself in this network, i.e. in various discursive sentences. Observations show that children see gender norms and values as a guide to their actions. This study attempts to answer the question of how these discourses can bring concrete knowledge to people and that in discourse theory it focuses on language, describing it as a place where social reality is produced and organized.

**Key words:** gender identity, gender debate, post-structuralism, pedagogical work, gender discourse.

**Language:** Russian

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### ГЕНДЕРНЫЙ ДИСКУРС В ПРЕПОДАВАНИИ: ТЕОРЕТИЧЕСКИЕ ПРЕДПОСЫЛКИ С ТОЧКИ ЗРЕНИЯ ПОСТСТРУКТУРАЛИЗМА

**Аннотация:** Современные дебаты о гендерно-чувствительном или гендерно-ориентированном преподавании пока лишь в общих чертах коснулись предметной области физического воспитания. Текущие тематические публикации на эту тему часто не содержат каких-либо подробных сведений. В данной статье предпринята попытка дать теоретические и дидактические импульсы в преподавании и переосмыслении категории "гендер". Дискурсы доносят знания до студентов-субъектов в форме объективированных реальностей. Задача субъекта - найти себя в этой сети, т.е. в различных дискурсивных предложениях. Наблюдения показывают, что дети видят гендерные нормы и ценности как руководство к своим действиям. Данное исследование пытается ответить на вопрос, как эти дискурсы могут принести конкретные знания людям и что в теории дискурса она фокусируется на языке, описывая его как место, где производится и организуется социальная реальность.

**Ключевые слова:** гендерная принадлежность, гендерные дебаты, постструктурализм, педагогическая работа, гендерный дискурс.

#### Введение

Люди распределяют себя и других по разным категориям: бедные против богатых, молодые против пожилых и т.д. Влияния и структуры категорий практически отсутствуют и структурирует идентичность и распределение ролей, особенно в первые годы жизни, так же

сильно, как и гендер. Разделение на мужскую или женскую особь происходит уже через некоторое время после рождения. Эта категоризация проходит как нить через всю последующую жизнь. Мы часто не осознаем, как много решений, которые мы принимаем, основаны на гендерной принадлежности. Ряд событий в так называемых

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"гендерных дебатах" привел к тому, что, хотя якобы гендерно-адекватные рабочие материалы по различным предметам можно найти в изобилии для сектора начальной школы, в них часто отсутствует проработанное рефлексивное понимание гендера. Это показывает, что современное естественно-научное образование должно позволить детям в рамках перспективы социальных наук "описать социально обусловленные гендерные различия которые служат возможности для действий, но которые также сами подвержены изменениям и на них может повлиять "Руководящие принципы". Она должна основываться на требованиях всегда планировать предметные уроки, исходя из жизненных реалий ребенка. Поэтому необходима дидактическая модель которая фокусируется на процессах гендерного развития учеников, не сводя их к простой модели "стимул-реакция", а скорее понимает их как субъективное, самоактивное взаимодействие с окружающей средой. Поэтому следующие соображения следует рассматривать на фоне критической конструктивной педагогики. Данная статья рассматривает предложения по гендерно-чувствительной педагогике на основе дидактической модели, и размещает задачи педагога на разных уровнях - уровень знаний, восприятия, отношения и действия. Таким образом, по аналогии с ее рассуждениями, в первом разделе речь пойдет об "уровне знаний" в гендерно-чувствительной педагогике.

В работе затрагивается в первую очередь уровень восприятия и отношения и предназначена для того, чтобы прояснить в какой степени "чувствительность к структурирующему эффекту категории гендер" и механизмы его дискриминации могут быть достигнуты.

В дебатах по образовательной политике на тему "гендер" в основном обсуждаются различия в успеваемости между мальчиками и девочками. Последние исследования показывают, что успеваемость у мальчиков по языкам и естественным наукам отстаёт. Феминистское исследование школ возникла в начале 1960-х годов и впервые заговорила о гендерной справедливости в школе и обществе. Он фокусируется в первую очередь на женском поле и рассматривает его социальное неблагополучие как коренящееся в различных процессах социализации мужчин и женщин.

Постструктурализм вошел в феминистские исследования в начале 1990-х годов и рассматривает язык и активное действие не только как представление социальных категорий, но и как их производитель.

1) Прежде всего, концепция "гендерно-специфической социализации" подразумевает естественность системы двух гендерных категорий. Тезис заключается в том, что

социализация будет типичной или специфической в зависимости от пола.

2) Использование новых терминов, таких как "гендер", часто имеет лишь ретулирующий эффект. Однако эссенциалистские представления о гендере и традиционные методы исследования остаются вне внимания.

3) Фокус на различиях в успеваемости скрывает большую часть спектра жизненных сфер детей и плюрализированных биографий.

4) Теория и исследования редко касаются обоих полов и их специфических механизмов дискриминации. Часто говорят только об образовании "для мальчиков" или "для девочек".

5) Во многих публикациях игнорируются межличностные составляющие процесса гендерного развития.

Гендер с точки зрения постструктурализма. Чтобы сделать постструктуралистскую гендерную теорию полезной для школ и работающих в них педагогов, требует точного определения понятий, которые были восприняты по-разному. Особенно Фуко, опираясь на него, Батлер, являются "пионерами" постструктуралистских гендерных исследований. В этом контексте первоначальное значение слова гендер также привлекает критическое рассмотрение "классиков" социологии.

### Власть, дискурс и субъект в работах Фуко и Батлер

Понимание власти Фуко, среди множества других трудов, четко выражено в его работе "Воля к знанию". Он пытается установить свой порядок через установление границ. Эти границы делят мир на "можно сказать" и "нельзя сказать", на "нормальный" и "ненормальный", на "моральный" и "аморальный". Только в пределах этих субъект может перемещаться в этих границах.

Например, все те люди, чей биологический пол имеет характеристики обоих гендерных полюсов, попадают под категорию "нарушение гендерного развития".

Батлер описывает гетеросексуальность как главную опору гегемонистского гендерного дискурса, который постулирует обращение к другому полюсу в бинарной системе бисексуальности как единственную нормальную форму желаний. Эта гегемонная норма служит исключительно для навязывания и поддержания идеала репродуктивной функции пола. В соответствии с этой линией обязательного гетеросексуализма происходит принятие гендерной идентичности - процесс, которому подвержен каждый человек, родившийся в современном обществе, человека, рожденного в современном обществе, и которая оказывает влияние практически на все сферы жизни. Для нее это скорее вопрос дискурса и стратегии. Она включает: "Если "гендер" (пол) сам по себе

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является культурно порожденной гендерной категорией (gendered), то от гендерной категории, было бы бессмысленно определять гендерную идентичность как культурную интерпретацию пола. Скорее, этот термин должен обозначать производственный аппарат, с помощью которого создаются сами полы". Его задача состоит не столько в том, чтобы называть вещи посредством языка, письма или других символических систем, сколько в том, чтобы социальные факторы, проходя через них, формируют знания и производят дискурс.

Батлер подводит итог: Только если секс, гендер и сексуальное желание "создают отношения согласованности и непрерывности, устанавливают и поддерживают отношения согласованности и непрерывности", индивид формирует так называемую внятную гендерную идентичность и тем самым находится в гармонии с существующими социальными конвенциями и властными дискурсами.

### Дискурсы и лингвистическая перформативность

Таким образом, необходимо сосредоточиться на дискурсах. Какую роль они играют в процессе гендеризации? Согласно Фуко, дискурсы - это системы высказываний, которые ссылаются друг на друга. Они производят объекты, о которых "говорят", изображая также практики, которые делают определения и демаркации в обществе эффективными в первую очередь. Сейчас Батлер опирается на этот подход. Она хочет выяснить, почему мужчины и женщины, геи и лесбиянки и т.д. имеют понятную идентичность.

Гендерный дискурс никогда не стоит на месте, но почти всегда связан с другими социальными, а также естественно научными дискурсами и коррелирует с ними. Гендерные различия могут, например, быть связаны с выводами из биологии и медицины или с социологически ориентированным феминистским (школьным) дискурсом.

На фоне измерения гетерогенности, описанные Веннингом в его статье о школьной гетерогенности, можно и нужно рассматривать как очень популярную концепцию. Гетерогенность, можно и нужно рассматривать как достаточно произвольную и, следовательно, расширяемую систему. Управление разнообразием также находится между эссенциалистскими и конструктивистскими взглядами.

В мета-анализе современных исследований, посвященных образовательным неудачам мальчиков в образовательной системе, Бонмайер приходит к выводу, что "насколько исследования в области социальных наук поддерживают преодоление неблагоприятных условий, настолько же они не поддерживают их. Теперь

возникает вопрос, как эти дискурсы могут принести конкретные знания людям. Для Батлер дискурсам присущи не магия и не механика. В теории дискурса она фокусируется на языке, описывая его как место, где производится и организуется социальная реальность. Ее утверждения о том, что мы можем относиться к миру только лингвистически и что конкретная перформативная речь придает материальность гендеру человека, предвещают лингвистический поворот в феминистской теории. Для более детального анализа этих продуктивных механизмов дискурса она использует теорию речевых актов Джона Л. Остина (11). Он утверждает, что язык не только функционирует как сигнификатор для означаемого вне языка, но и когда мы говорим, мы также что-то делаем, что мы совершаем действия одновременно, называя их. Описательность и перформативность идут рука об руку для Остина (11) и Батлер (2). Однако для того, чтобы речевой акт выглядел "достоверным", он должен соответствовать ряду требований. Таким образом, использование языка человеком, обладающим достаточным уровнем интеллекта, играет не менее важную роль, чем соответствие между содержанием и социальными нормами.

### Субъективное присвоение гендера

Какова ситуация для субъекта в существующих властных отношениях? Для Фуко субъект подвергается воздействию этой ограничительной системы, выполняет ее правила, но в то же время выступает как активный производитель и участвует в воспроизводстве и модификации существующих властных отношений. Активный производитель и участвует в воспроизводстве и изменении существующих властных отношений. Таким образом, Фуко не отрицает существование субъекта, но при этом он отходит от идеи уверенного субъекта, который может действовать независимо и рационально в обществе.

Центральным моментом в рамках постмодернистской субъективации является практика обращения. Момент обращения к человеку с именем или обозначением; мужчина - женщина; девочка - мальчик; гей - лесбиянка; мы можем реагировать на это и таким образом принимать это имя или идентичность для себя, или мы не реагируем на это. Идентичность для себя или мы не реагируем на демонстрацию того, что мы не являемся тем, кем нас считают другие. Однако эти ярлыки - не пустые понятия, они часто связаны с так называемыми "онтологическими инструкциями", которые "определяют, что можно считать разумным гендером, которые вызывают и закрепляют репродуктивные ограничения сексуальности, которые сексуальные или гендерные тела чтобы достичь своей культурной разборчивости". Это проблематично по



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следующей причине: в процессе называния целостность человека теряется из поля зрения вызывающего. Следует отметить, что субъект находится не только под влиянием одного дискурса, но и постоянно сталкивается с несколькими дискурсами, некоторые из которых противоречат друг другу. Достижение субъекта состоит в том, что он находит путь через эту частично противоречивую сеть знаний и власти и таким образом формирует себя в смысле "формирования идентичности". Суверенитет воображаемой концепции субъекта, как отмечает и Фуко, всегда остается увязшим в существующей сети властных отношений, а именно в языке как месте социальной реальности. Даже жизненные конструкции, выходящие за рамки разумной гендерной идентичности, с одной стороны, никогда не выходят за пределы предопределенных категорий, которые управляют нашим восприятием.

### Школа как учреждение

В контексте данной работы школа понимается как пространство, в котором гендерные отношения, переносимые властными отношениями и дискурсами, получают особое закрепление. Дискурсы могут закрепиться и завоевать учеников. С этой целью Фуко описывает школу как пространство, в котором человек подвергается постоянному наблюдению и контролю, как со стороны учителей, так и со стороны одноклассников. Их превращение в субъект происходит под влиянием институционального воздействия в рамках строго регламентированного курса обучения или разделения гетерогенного студенческого коллектива.

Йекле рассматривает школу как место, где субъективные и объективные реалии в равной степени влияют на учеников. Школа как социальное место предоставляет пространство для субъективного и объективного конструирования реальности. Ученики получают объективные знания о бинарном коде бисексуальности через школу (8).

Бинарный код бисексуальности: Они могут социально присвоить это гендерное знание через интерактивные практики действия, так что объективно возникающие реальности также могут быть найдены в их собственных субъективных реальностях. Гендерные процессы (такие как гендерный габитус, стиль одежды, хобби, интересы и т.д.), которые не передаются средствами вербального языка, но не менее сильны в своей выразительности.

Йекле рассматривает школу как пространство, в котором исследуется сказанное и несказанное, а ученики формируются в соответствии с онтологическими гендерными императивами, но не упускает из виду

разнообразие и противоречивость дискурса и предложений субъективации, с которыми ученики сталкиваются в институте школы (8). В этот момент снова ссылаемся на Батлер (1), которая рассматривает средства инвокации как наиболее прямой способ приписывания идентичности. Учителя могут дискурсивно-перформансировать, напрямую обращаясь к ученикам как к мальчикам или девочкам. и тем самым воспроизводят бинарный код гендерных отношений, но с разными представлениями о том, что значит быть мальчиком или девочкой. По этой причине человека нельзя назвать пассивным получателем этих предложений; он должен занять свою позицию в отношении этих противоречивых предложений. Они сами должны принять решение по этим противоречивым предложениям и могут принять их или нет.

В то же время в рамках работы над идентичностью учащиеся должны чувствовать себя аутентичными мальчиком или девочкой. Это приводит к социализации в школе, чтобы воспринимать себя таким образом, чтобы чувствовать себя мальчиком/девочкой, думать и действовать как мальчики/девочки и что они воспринимают себя как живущих своей индивидуальной аутентичностью. При этом среди девочек и мальчиков преобладает нормализующая культура".

### Деконструкция как педагогическая задача

Теперь необходимо задавать вопрос о том, в какой степени деконструкция может быть использована как основа для получения знаний в рамках системно-конструктивной педагогики. Целью является выявление различия, которое не подразумевается в смысле определения различия по содержанию, а скорее фокусируется на структурных процессах демаркации и задается вопросом "как" при возникновении категорий. Деконструкция включает в себя, по сути, два этапа.

В соответствии с пониманием власти Фуко, согласно которому идентичность формируется в первую очередь через исключения определенных групп людей и жизненных биографий. Поэтому изучить те моменты, в которых дети используют бинарные кодировки (мальчик - девочка), спорят с ярлыками и гомогенизацией и, в результате, открывают возможности для действий или альтернативы для действий или исключают их. Анализ этих процедур включения и исключения позволяет заглянуть за фасад разнообразных гендерных императивов и обнаружить то, что скрыто, исключено и недосказано. В этом месте следует сослаться на Биттнера, который рассматривает учебники с уроков биологии, английского языка и истории, которые активно используются в школах для воссоздания определенных гендерных образов в форме ГЛБТ,

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и задается вопросом, в какой степени гендерные стереотипы и гетеронормативные жизненные планы закрепляются или релятивизируются такими материалами. Однако, как отмечает Батлер (2), сказуемое - это не фиксированные, неизменные категории, а подверженные постоянным изменениям. В эмпирических исследованиях это требует не только раскрытия конкретных механизмов переговоров, но и постановки под сомнение бинарных рамок бисексуальности как таковых. В смысле философии Батлер, сдвиги и нарушения границ являются характером гегемонистского гендерного дискурса, сдвиги и трансгрессии не только возможны, но и весьма вероятны. Поэтому деконструктивистское наблюдение должно начинаться с фрагментарной, незавершенной личности, и, с одной стороны, те "исключенные и неавторизованные функции, которые сотворяют субъект", но и те практики самих субъектов, которые на мгновение вводят невыразимое в горизонт мысли. Таким образом, субъект, а значит и объект этнографического исследования, не упраздняется, а лишь подвергается сомнению и помещается в свет постоянной открытости и реинтерпретируемости.

Однако гегемонистские гендерные нормы также являются вызовом для отношения самих педагогов, особенно когда речь идет о наблюдении за учениками. Тема "гендера" требует от учителей "сохранять старый взгляд, вовлеченный в реализацию прожитой бисексуальности" (Hagemann-White 1993, 74). Поэтому важно получить информацию в ходе наблюдений или бесед с учениками, не провоцируя и не драматизируя гендерные стереотипы. Иногда это можно сделать, просто назвав человека девочкой или мальчиком. Наконец, в контексте открытия гендерно-дискурсивных процессов следует помнить, что в процессе гендерного дискурса следует помнить, что критическое осмысление гендерных различий именно в этих структурах, таких как язык, мышление, чувства, действия, также является частью процесса. Обращать на это внимание - значит понимать деконструкцию, как указано выше, и постоянно размышлять о собственном влечении в гегемонистский гендерный дискурс и, например, не останавливаться на высказываниях самого лидера дискуссии в групповых обсуждениях.

Планирование естественно-научного образования на основе знаний ребенка. После того, как все члены группы были представлены, разговор начинается с вводного стимула в виде просьбы рассказать о себе. Таким образом, все дети с их неоднородным опытом должны быть охвачены этим первым вопросом. Пять тем: Повседневная жизнь после школы/хобби В

основном это касается досуга учащихся. Однако в центре внимания находится не вопрос о гендерных увлечениях. В рамках гендерной субъективации, речь скорее должна идти о конкретных механизмах включения или исключения, с помощью которых они открывают или отказывают себе в возможности организовать свой досуг. Внешний вид/стиль одежды Аналогичная картина возникает и для телесно-физических способов восприятия. Планы профессиональной и семейной жизни параллельно с этим нас также интересует, в какой степени у школьников в возрасте девяти-десяти лет уже сложились представления о времени после школы и в какой степени на это влияют определенные образы гендера. Социальная структура в классном сообществе/дружба/любовь В этой области также рассматривается вопрос о том, в какой степени социальная структура соопределяется процессами гендерного дискурса и формируют ли гетеронормативные модели мышления представления о любви и партнерстве.

После этих очень общих вопросов ("Что вы делаете после школы" и т.д.) интервьюер может задать более конкретные вопросы, например, чем занимаются дети в свободное время и с кем они любят проводить время. Особый принцип данного руководства заключается в следующем, стереотипные представления о гендере не всегда должны рассматриваться напрямую. Это может спровоцировать или драматизировать гендерные различия между учениками, не документируя в заявлениях фактическое самопозиционирование или дискурсивные переговоры. Скорее, речь идет об устранении гендерных стереотипов из повседневного понимания детей. Гендерные стереотипы из повседневного понимания детей и не заставлять их верить в то, что ведущие являются высказывания детей о "правильном" мальчике или "правильной" девочке. Такой подход явно не достиг бы цели - охватить процессы гендерной субъективации. Вместо этого, например, в категории "повседневная жизнь после школы/хобби" уместно напрямую обратиться к отдельным детям с вопросом об увлечениях их одноклассников, всегда имея в виду предполагаемые "гендерные" занятия или характеристики. Хобби человека и почему он согласен/заинтересован или не согласен с ним, почему они согласны/заинтересованы или не согласны с этим. Таким образом, можно преодолеть парадокс, связанный с тем, как ученики относятся к гендеру.

Это специфическое для класса регулирование представляет собой лишь один момент из многогранного богатства процессов школьной социализации, которые, помимо официальных учебных планов, приближают

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объективированные гендерные реалии к ученикам.

В ходе оценки материала стало очевидно, что для учеников среда групповых дискуссий представляет собой своего рода "сцену", на которой, как во время спектакля, различные гендерные образы жизни могут быть представлены на дискурсивном и недискурсивном уровнях. Гендерные стили жизни на дискурсивном и недискурсивном уровнях становятся центральной темой. В процессе дети сталкиваются с нашими вопросами преимущественно на уровне повествования. Множество повествований личный опыт значительно обогатил беседы. Следующее деконструктивистское прочтение предназначено для краткого представления основных результатов. В начале нам следует кратко упомянуть об общей нити, которая проходит через все три дискуссии: Когда разговоры детей переходят в гендерный дискурс, они постоянно ссылаются на биполярное понимание гендера. Понимание гендера, которое противопоставляет интеллигентный женский образ личности мужскому противоположно мужскому. Особенно в последовательностях с особенно "гендерно окрашенными" темами из области "повседневная жизнь после школы/хобби", например, "кукольный театр" или "футбол", дети переключаются на гендерный дискурс без нашего намерения в этот момент.

Гендерные стереотипы и заставляют педагогов переходить здесь на гендерный дискурс. Выражая себя в дискуссиях преимущественно лингвистически и обращаясь к миру лингвистически, дети перемещаются в социальной сфере.

### Возможности работы в классе

Результаты показывают: Восприятие процессов гендерной субъективации учениками с Постструктуралистские "очки" могут помочь педагогам раскрыть то, что до сих пор было скрыто. Выявляются новые отправные точки, но также и опасности, на которых преподавание - в частности, предметное преподавание - может построить утверждение системно-конструктивистской педагогики. Представленный здесь инструмент для постановки вопросов. Пять категорий, чтобы исследовать как можно более широкий спектр жизненных миров и реальностей детей. В то же время, особая техника постановки вопросов позволяет проанализировать их на предмет возможного влияния гендерных, объективированных реалий. Поскольку обследованная выборка слишком мала, чтобы можно было сделать репрезентативные заявления, следующие объяснения следует понимать как конкретные возможности для действий ответственного учителя данного класса. Учитель

столкнется с дисбалансом власти в классе, что подвергает мальчиков и девочек воздействию специфических механизмов дискриминации. Ввиду тонкости этих механизмов представляется необходимым ознакомить учеников с ними. Это может быть сделано в форме ролевых игр с детьми постарше также с помощью иронии или преувеличения. С другой стороны, ситуация для мальчиков более сложная. Анализ властных отношений в классе показывает, что прежде всего "мужские" роли и идентичности оказываются особенно влиятельными и поэтому приветствуются. Таким образом, предметное обучение не должно останавливаться на простой смене ролей, которая дает детям понять, что гендерная справедливость достигается, когда женщинам разрешается участвовать в мире "мужских" идеалов. Это не приведет ни к расширению сферы действия ни для мальчиков, ни для девочек, которые не могут или не хотят участвовать в паутине гендерного дискурса. Урок по предмету, спланированный подобным образом, подвергается риску простого воспроизведения распространенных гендерных стереотипов. Поэтому кажется разумным начинать преподавание предмета на шаг раньше и не привязывать влиятельные позиции к гегемонистским гендерным нормам. Скорее, они сами должны быть деконструированы на элементарном уровне, что не исключает биполярности самих полов. Здесь также может помочь междисциплинарное преподавание, но не только в форме простого представления известных личностей.

**Тематизация должна всегда происходить на фоне социальных норм и ценностей соответствующего времени и культуры.** Это означает задавать вопросы об общественном восприятии того, является ли якобы гендерно нечувствительное ролевое поведение.

Ролевое поведение на самом деле было чревато раздражением и возможной потерей социального признания или воспринималось как вполне нормальной. Например, у некоторых коренных народов Северной и в Центральной Америке, например, существование третьего пола считается обычной альтернативой для людей, которые не могут отнести себя к одному из двух полюсов. Даже широко принятые сегодня формы семьи, такие как родитель-одиночка всего несколько десятилетий назад вызвал такие же споры, как и сегодня. Так называемая "радужная семья", т.е. семьи, родители которых живут в однополых отношениях. На заре появления первых детских садов воспитание детей находилось в руках мужчин, и это тоже свидетельствует об изменении в распределении ролей в обществе. Это также свидетельствует об изменении в распределении ролей в образовании

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и семье. Наконец, перерывы в жизненных биографиях учеников не должны оставаться без внимания.

### Заключение

Таких примеров можно найти множество, которые зримо подчеркивают относительный характер онтологических гендерных императивов вплоть до нормы самой биполярной гендерной системы. Результаты также показывают, что не только официальные учебные программы должны быть разработаны с учетом гендерных аспектов, но и лингвистические и нелингвистические учебные программы. Лингвистические и нелингвистические взаимодействия между студентами и преподавателями, а также процессы

преподавания-обучения. Правило группировки по половому признаку позволяет ученикам испытывать гендерную дискриминацию в прямой форме. Учитель как вменяемая личность также может воспроизводить онтологические императивы и влиять на субъективные конструкции реальности детей.

Целью всей педагогической работы должно быть освобождение "гендера" от его ограничивающей природы без нормативной замены старой гендерной концепции на новую или упразднения "гендера" как категории. Но должны быть созданы такие модели интерпретации, которые не дискриминируют учеников и не угрожают им исключением.

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## ECOLOGICAL AND TOXICOLOGICAL CHARACTERISTICS OF THE WATER OBJECTS AT KRASNOGRAD DISTRICTS IN KHARKIV REGION

**Abstract:** It was shown that surface and underground sources in Krasnohradsky district, removed from gas mines, are in good state. It was investigated 8 sources to determine toxicity by biotesting method. It was determined big toxicity in one object and middle toxicity in two ones. According to the results of chemical analysis it was established that source No 3 contains excess of sulphates, total hardness of water and alkalinity, Ca, Mg and dry ppt. It was proved that this water does not correspond to DSan Pin 2.24-171-10 and cannot be used for everyday use. It was established that water from Oktabrsk source may be used as curable with mineralization 1,0-3,0 g/ml. Water from Khomutovski park has excess of nitrates in 1,2 times. It was shown that water from sources compare with plumbing water is colourless, without taste and smell. Plumbing water is with chlorine smell, unpleasant taste but corresponds to standards of drinking water.

**Key words:** surface and spring water, chemical analysis, toxicity biotesting, PDK.

**Language:** English

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### Introduction

Krasnohrad district lies within the Dnieper lowland. Its relief was created under the action of pouring water. Its surface is wavy plain, divided by river valleys, multiple streams and ravines. It is the

part of the Kharkiv Dnipro-Donetsk watershed plateau, on southeast of the Poltava accumulation of the forest fragmented plain, to the west from the Dnipro-Siversky Donets watershed, which lies within the borders of Prydniprovsk left bank lowland. The

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highest point is 200 m above sea level, the lowest is 85–105 m. River valleys and gullies are the main landforms of Krasnograd district. However, the density of the beam dismemberment, depth and shape of beams is significantly facilitated within different limits of geomorphological levels. The most complex and saturated character in outbuildings of the district are owned by the influence of the Orchyk and Berestova rivers. The territory of the district is dominated by long, tree-like beams. Thus, the surface district has a general slope from northeast to west. The water sources of the district, both surface and underground, unfortunately, constantly exposed to anthropogenic pollution, such as fall during the development of gas condensate fields (infiltration into water, chemical reagents, oil, fuel and lubricants and rare products of gushing wells); impact from activity of agricultural objects. The city of Krasnograd is provided with drinking water, which has artesian water origin. Water from artesian wells enters the reservoirs, and then it is supplied to the station for lifting, and from it to the consumer. In connection with the extremely poor condition of the water supply networks, water often reaches the consumer with a high content of impurities. Therefore, it is recommended to the population install individual cleaning devices. The method of disinfection is chlorination is carried out using a mobile chlorate installation. The object of the research is the surface and underground waters of Krasnograd district of Kharkiv region.

The subject of the study is the quality of groundwater in Krasnograd district. The purpose of this work was to determine the ecological state of spring water of Krasnograd district of Kharkiv region to complete the general catalog of studied sources using chemical analysis and method biotesting. In the course of the analysis, a classification was established by the level of water toxicity and degree of contamination. Environmental toxicity can be created even when pollutants are present in acceptable concentrations. Biotesting is a procedure for determining the toxicity of individual chemicals substances, surface fresh, sea and brackish, underground and wastewater to assess changes in vital functions or detect lethal effects on test objects (hydrobionts). The experiment included a series of repetitions with different dilutions of the test substance, and the control - the same test organisms in pure water or in a medium for cultivating hydrobionts. The biotesting method was used in combination with chemical ones research methods, because the chemical composition cannot be evaluated toxicity of substances and how they affect organisms. Biotesting gives direct results results about the degree of danger of the environment under investigation.

According to the biotesting method, it was found that in source No. 1 p. Dobrenka and V source No. 3. In source No. 1 p. Berestovenki, the highest quality

water. Water toxicity is not manifested in the spring well of Orchyk village. Petrovka, v source No. 7 p. Berezovka, in source No. 2.1 p. Pischanka, in source No. 2.2 p. Chickweed. [1,p.24;2,p.16;3,p.11;4,p.20;5,p.50;6,p.39;7,p.52;8,p.38;9,p.48;10,p.85;11,p.77;12,p.9;13,p.51;14,p.75;15,p.83]

### Experimental part

In order to study the ecological state of water sources in Krasnograd district and determination of water quality by the method of biotesting on crustaceans (*Ceriodaphnia affinis* Lilljeborg) as the most sensitive object to wide spectrum of chemicals and for use in water protection practice according to carrying out toxicological assessment, control of surface and drinking water samples were taken from 8 sources of the district. The toxicity of water is manifested in the spring of Khomutovsky Park city of Krasnohrad and source No. 3. village of Berestovenka in accordance with the protocols. The pollution of these sources is influenced by a large number of factors, according to our observations, the toxicity of the Khomutovsky Park source (the city of Krasnohrad) are affected by the following factors: a large number of motor vehicles (a car park nearby) and the leaching of mineral fertilizers (there are agricultural lands around) and household waste (a landfill nearby). On the toxicity of water from the source of the village. Birches can be affected by: railway, domestic and industrial waste. For chemical analysis, water samples were taken from three sources in the study area and a water sample from a local water supply. In 2014–2015, the quality of the sampled water was assessed according to DSanPiN 2.2.4-171-10 according to organoleptic, physicochemical, and sanitary-toxicological parameters. Water samples were checked for the content of calcium, magnesium, dry residue, total hardness, total alkalinity, metal compounds and other indicators. When comparing the results of the analysis of water samples from the sources of the village. Berestovenka, with. Oktyabrskoe and sources in Khomutovsky Park, which were carried out on 17.10.2019, 11/19/2020 and 11/05/21 in the educational research laboratory of analytical of environmental studies of Kharkiv V.N. Karazin National University can draw the following conclusions:

- conducted a study of sanitary and chemical indicators of safety and in the quality of spring water for two years established an insignificant difference ranging from 10 to 15 percent) by all defined indicators, which is quite natural;

- the analysis of organoleptic indicators did not establish exceedances of MPC, however, the taste and aftertaste indicators characterize the studied water as salty and bitter-salty;

Laboratory analysis of the chemical composition of three sources in Krasnohrad found that all sources exceeded the MPC of sulfates, total hardness, total

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alkalinity, calcium, magnesium and dry residue. Such water according to DSanPiN 2.2.4-171-10 does not meet the indicators of physiological adequacy and cannot be used for everyday consumption;

- research of sanitary and toxicological parameters in spring water determined an excess of content in the water of Khomutovsky Park in the city of Krasnograd nitrates by 1.2 times, which makes this water dangerous for humans; tap water meets standards for drinking water according to DSanPiN 2.2.4-171-10.

Conducting observations on the state of spring water for several years, including visual observations and description of water bodies, as well as establishment of qualitative and quantitative indicators of the chemical composition of water, replenishing the data of the catalog of sources of the Krasnograd district - was the main one task of the conducted monitoring. This made it possible to assess the ecological condition sources, determine possible ways of contamination with further reduction or complete elimination of their impact on the state of water ecosystems. A comparison of the content of the studied components is shown in Table 1, according to which it can be said that both by organoleptic and by sanitary-chemical indicators of the safety and quality of spring water there is a significant excess of indicators in source No. 3 p. Berestovenka and Khomutovsky Park in Krasnograd, research was carried out during 2014–2015, 2017. According to the results of the monitoring of the condition of the 3 sources, a significant amount was established exceeding indicators: total hardness by 2.2 times, dry residue by 1.38 times.

### Conclusions

There are 16 registered in Krasnograd district sources that differ significantly in the content of chemical substance.

1. Surface and underground sources that are distant from development gas condensate deposits are in a relatively satisfactory condition, however, sources of drinking water need improvement and constant monitoring water by biotesting and chemical methods.

2. 8 sources were tested for toxicity by biotesting, in one acute toxicity was detected from them, chronic toxicity was detected at two objects toxicity (the village of Berestovenki and the spring of Khomutovsky Park).

3. A chemical analysis of three sources was made: source No. 3 p. Berestovenki, Khomutovsky Park, the results of which showed an excess of MPC in terms of content sulfates, total hardness, total alkalinity, calcium, magnesium and dry matter the remainder.

4. Water springs from the village. Oktyabrskoe, can be attributed to the medical canteen, a namely, brackish with 1–25% mineralization or slightly saline with mineralization 1.0–3.0 g/dm<sup>3</sup>, and use as a refreshing drink or in medical preventive purposes.

5. Water from the spring of Khomutovsky Park Krasnograd has an excess 1.2 times the nitrate content, which makes this water dangerous for humans.

6. Water from springs is transparent, colorless, without smell and taste, softer, pleasant to the taste.

7. The water from the tap has a chlorine smell and is unpleasant to the taste, but it responds standards for drinking water according to DSanPiN 2.2.4-171-10.

8. Based on the results of the analysis, recommendations were made regarding prevention of pollution of water bodies, in particular, to observe technological mode during exploitation of oil and gas fields.

9. Sources whose water is suitable for drinking need improvement and constant control.

**Table 1. The results of testing of water sources at Krasnograd districts in Kharkiv region.**

№	Name of the object	Number of alive cereodafnias	Middle value		Standard deviation		Students criteria		Conclusions	
			6	6.33	0.58	1.53	1.34	0.72	Untoxic	Untoxic
1.	Source№1, at Berestovenky	3	6	6.33	0.58	1.53	1.34	0.72	Untoxic	Untoxic
2.	Source№2, at Berestovenky	1	0.2	7.0	0.33	0,00	3.10	0,00	Toxic	Toxic
3.	Source№3, at Berestovenky	5	1	9.50	0.75	2.51	0.10	0.16	Untoxic	Untoxic

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4.	Source№1, at Dobrenky	3	0.6	4.00	0.58	1.00	1.34	1.82	Untoxic	Untoxic
5.	Source№1, at Pishanky	5	1	4.00	0.75	1.22	0.10	0.78	Untoxic	Untoxic
6.	Source№2, at Pishanky	5	1	9.80	0.75	1.64	0.10	0.53	Untoxic	Untoxic
7.	Source at Orcyk	2	0.4	6.50	0.47	0.71	2.15	2.32	Untoxic	Untoxic
8.	Source at Krasnograd	1	0.2	7.00	0.33	0,00	3.10	0,00	Toxic	Toxic

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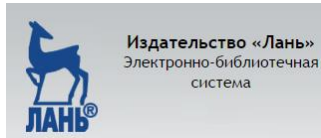
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