

Confirmative Component Analysis of Management Optimization of Educational Organizations

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Abstract

This research aimed to analyze the corroborative components and examine the correspondence between the corroborative structure of the management of educational organizations and the empirical data. The sample consisted of 400 educational administrators in Thailand. The instrument used in this research was a questionnaire with a confidence value of 0.95 in the whole questionnaire. For Confirmative Component Analysis and second corroborative component analysis, the results showed that Educational Organization Management Optimization Components. The components whose weights were arranged in descending order include Organizational structure, Human Resources, Organization Management and Leadership. The results showed that first confirmed components that all index values were found to pass the criteria. They had an element weight of 0.01-0.15 with a statistical significance of .01 and a second-order confirmation component analysis result. All index values were found to pass the criteria. The constituent weights of 0.26-1.26 were statistically significant at .01. The harmonization index between the model and the empirical data was $p = 0.09$, $CMIN/DF = 1.59$, $GFI = 0.99$ and $RMSEA = 0.02$. It made you aware of the components of organizational management optimization in education to be used to further develop educational organization management efficiency.

Keywords: Corroborative component analysis, Optimization, Organization management, Education

Introduction

The education system was an important factor affecting the development of people and the nation. Because it was a process of creating learning and an important basis for improving the quality of life, society, and economy (Montri, 2015). It was the basis for solving various problems and was also an important basis for each individual when an individual with a good educational background can be combined into a cog to drive the prosperity of the country resulting in success in various fields, whether economically, socially and in all aspects, which will definitely lead the country to an international level. Everything that has been said depends on the effective management of education. Nowadays, the social and economic conditions of countries around the world are linked and more interdependent, planning and analyzing global economic trends society and politics Including the development of human potential based on databases and statistics were very important and necessary for the development of the country towards sustainability and balance management or the International Institute for Management Development (IMD) analyzes and ranks the competitiveness of countries around the world based on the different environments that affect their competitiveness. It is conducted annually and has presented its results in the form of The World Competitiveness Yearbook (WGY) since 2007. 1989 to present and ranking results obtained from data analysis through indicators. It covers four main factors: 1) economic performance, 2) government efficiency, 3) business efficiency, and 4) infrastructure. (Office of the Education Council Secretariat, 2015), which would reflect the capabilities and performance of the country in creating and maintaining an environment suitable for business operations. Countries with high competitiveness would have a high level of productivity. This made it possible to maintain sustainable economic growth as well for the infrastructure at international institutions in order to develop a focus, there is a part of educational management included in the country's competitiveness rankings (Office of the Education Council Secretariat, 2015), in line with the results of the World Economic Forum (WEF) rankings, presented in the report "The Global Competitiveness Report 2013-2014" the 2012-2013 study at in the past, Thai education fell to 8th place among ASEAN countries. The countries in ASEAN are as follows: 1) Singapore 2) Malaysia 3) Brunei 4) Indonesia 5) Philippines 6) Laos 7) Cambodia 8) Thailand and 9) Vietnam (Office of the Education Council Secretariat, 2015) Currently, education in Thailand has clearly divided compulsory education at different levels, whether it was education at the primary level, secondary level, or vocational level, higher education is also divided into Thai education under different ministries, and departments, which care will be different. The educational administration of private educational institutions is different from public education institutions. It is characterized as an educational business, in addition to having to focus on academic quality. The administration also had to consider profits in order to operate the business as the relatively large decline in the number of learners affected private schools and the number of students. Therefore, it said that the educational administration of private educational institutions was a competitive educational business and it was necessary to improve the efficiency of management. And the Private

Education Commission Since the academic year 2012 onwards, a number of educational institutions have been closed continuously and due to the decline of educational institutions, there has been an interest in finding out how to find a model of private education management that would have ways to be able to sustainable; therefore, the researcher is interested in finding ways to manage educational organizations as a guideline to improve the performance of educational institutions to be effective and effective which would lead to sustainability in the future.

Research Objectives

1. To analyze the corroborating components of the organization management optimization in education with confirmative component analysis.
2. To examine the coherence between the corroborative structure of the organizational management optimization in education and the empirical data.

Literature Reviews

This research reviewed the paper as follows:

Leadership Theory: Leadership theories are the explanations of how and why certain people become leaders. They focus on the traits and behaviors that people can adopt to increase their leadership capabilities or their skills and leadership theories help explain how leader harness and develop these traits.

Human Resource Management: Human resource management (HRM) is the practice of recruiting, hiring, deploying and managing an organization's employees. HRM is often referred to simply as human resources (HR). A company or organization's HR department is usually responsible for creating, putting into effect and overseeing policies governing workers and the relationship of the organization with its employees. The term human resources were first used in the early 1900s, and then more widely in the 1960s, to describe the people who work for the organization, in aggregate (Wesley, 2022). The objectives of HRM can be broken down into four broad categories: Societal objectives, Organizational objectives, Functional objectives, and Personal objectives.

Concept of Organizational Structure: An organizational structure is a system that outlines how certain activities are directed in order to achieve the goals of an organization. These activities can include rules, roles, and responsibilities. The organizational structure also determines how information flows between levels within the company. For example, in a centralized structure, decisions flow from the top down, while in a decentralized structure, decision-making power is distributed among various levels of the organization. Having an organizational structure in place allows companies to remain efficient and focused (Quangyen & Yezhuang, 2013).

Organization Management: The organizational management of a business needs to be able to make decisions and resolve issues in order to be both effective and beneficial. The process of organizing, planning, leading and controlling resources within an entity with the overall aim of achieving its objectives. In addition, organization management refers to the art of getting people together on a common platform to make them work towards a common predefined goal. Organization management enables the optimum use of resources through meticulous planning and control at the workplace. Essential Features of Organization

Management comprised planning, organizing, staffing, leading, control, time management, and motivation (Prachi, 2022)

The literature review can summarize the component of Management Optimization of Educational Organizations comprising leadership, human resource management, organizational structure, and organization management as follows the figure 1.

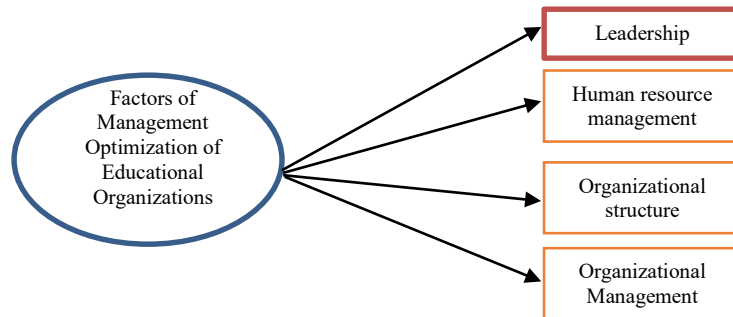


Figure 1 Conceptual Framework
(Source : Researcher, 2022)

Methodology

Components synthesis

The process for synthesizing components of organizational management optimization in education is as follows:

1. Study the documents, concepts, theories and research results related to the enhancement of educational organization management.
2. Select variables and components which consist of Organizational structure, Human Resource Management, and Leadership.
3. Apply a conceptual framework for research as shown in Figure 1, by proposing a hypothetical model on the components of organizational management optimization in education which is consistent with the empirical data.

Population and sample

The population was educational institution administrators in Thailand. There are a total of 600 locations (Department of Industrial Works, 2020). Because this research was a factor analysis, a minimum of 10 – 20 samples were required per 1 observed variable (Schumacker & Lomax, 2015; Kline, 2016; Jackson, 2003). In this research, there were 18 observed variables. Therefore, an appropriate sample size for structural equation model analysis should be at least equal to $10 \times 400 = 400$ units. After that, we used the purposive sampling method.

Research Instrument

The research instrument was a questionnaire on factors influencing organizational management efficiency in education. The questionnaire was a rating scale, which had five criteria for assessing the weight of the assessment according to Likert's method, and respondents made the right choice (Joshi et al., 2015). Researchers then took the draft questionnaire created with the assessment form to 5 experts. who had knowledge and

experience in the field to be studied, considered a questionnaire of 3 persons to find the quality of the tool by examining the Index of Item-Objective Congruence (IOC) The value is between 0.60-1.00, the optimum value is 0.50 or more (Turner & Carlson, 2002). The discriminant power was between 0.43-0.84 and the confidence of the whole questionnaire was 0.95, which is greater than 0.9 considering that the confidence was at a very good level (George & Mallery, 2003) collecting data by asking for assistance in responding to questionnaires from the sample group.

Data Analysis

The researchers performed a corroborative component analysis of the built measuring instruments (Confirmatory Factor Analysis: CFA) and second-order confirmation component analysis, Second-order Confirmatory Factor Analysis (S-CFA) examines the coherence of the structure-correlation model of the components developed with the empirical data with the use of statistical and social science software packages.

Results

This research was a corroborative component analysis and examined the coherence between the corroborative structure, the corroborative component analysis of the organization management optimization in education and the empirical data. The researcher divided the presentation of the research results as follows:

The results of the exploratory component analysis

The results of the corroborative component analysis

Confirmative Component Analysis (CFA)) to examine the structural validity of the observed variable measures in research and model development to be consistent with empirical data which is a model that the researcher has modified until it is complete, acceptable and reliable according to the principles of the research process. Researchers need to take into account the criteria used to evaluate and modify the model, it must also be widely accepted and used. Arbuckle (2013) recommends the model evaluation criteria that should be used considered 4 criteria as shown in Table 1 – 2.

Table 1 Mean and Standard Deviation of all Variables.

n = 400			
Variables	\bar{x}	S.D.	Interpretative
Leadership	4.04	0.79	Much
Human resource management	4.06	0.77	Much
Organizational structure	4.05	0.71	Much
Organization management	4.14	0.77	Much
Total	4.07	0.76	Much

From table 1 The overall management enhancement component of the educational organization was at a high level. ($\bar{x} = 4.07, S. D. = 0.76$)

Table 2 Presents the criteria for assessing the conformity of the underlying model with the empirical data.

(Evaluating the Data-Model Fit)	(Criteria)	Evaluation
1) CMIN- ρ (Chi-square Probability Level)	$\rho > 0.05$	The value ρ must be greater than 0.05. The higher the value ρ , the better.
2) CMIN/df (Relative Chi-square)	< 3	CMIN/df must be less than 3. The closer the CMIN/df value is to 0, the better.
3) GFI (Goodness of fit Index)	> 0.90	The GFI must be greater than 0.90. The closer the GFI value to 1, the better.
4) RMSEA (Root Mean Square Error of Approximation)	< 0.08	The RMSEA value must be less than 0.08. The closer the RMSEA value is to 0, the better.

Table 2 shows the four key model evaluation criteria of the AMOS program, and the researcher has to adjust the research model to meet all of these criteria. Therefore, it can be considered that the model is complete, acceptable and reliable in accordance with the principles of the research process.

The results of confirmation element analysis to verify the structural validity of the gauge prior to component modification revealed that $p = 0.00$, CMIN/DF = 4.74, GFI = 0.79 and RMSEA = 0.08, indicating that the model was inconsistent with the empirical data. The researcher adjusted the composition to choose a method to exclude observed variables that had inappropriate values and connect the arrowhead so that the modified latent component or variable is most consistent with the empirical data. The results of the confirmation component analysis to verify the structural validity of the gauge after the component modification revealed that $p = 0.11$, CMIN/DF = 1.51, GFI = 0.99 and RMSEA = 0.02, indicating that the model was consistent with the analytical data as shown in Figure 2.

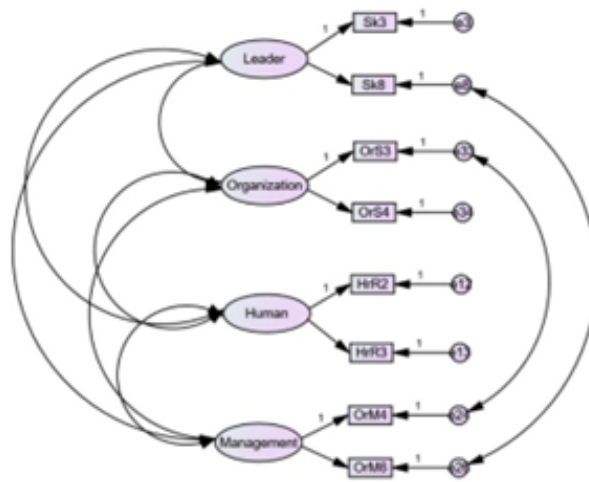


Figure 2 Confirmative component analysis (CFA) results after model modification
(Source : Researcher, 2022)

From Figure 2, the results of the confirmation element analysis verify the structural validity of the gauge after the component adjustments were made. When considering the components of the leadership variables, it found that there were two variables that were weighted in the identification of all variables, arranged in order of priority from most to least: the ability to use a foreign language in good communication skills (SK3) and knowledge transfer skills (SK8), with the weight of the components equal to 1.00 and 0.76, respectively, when considering the organizational structure components found that there are variables that are weighted in the identification of all variables, 2 variables, arranged in order of priority from most to least, namely the establishment of an educational institution board of directors from representatives of work groups and outsiders (ORS4) and An operational manual and a clear regulation to be used as a guideline for the operation (ORS3) with the weight of the components equal to 1.11 and 1.00, respectively. In the identification of all 2 variables, the order of importance is from highest to lowest, i.e. providing adequate welfare for the life of personnel (HRR3) and having an evaluation system Fair and practical performance (HRR4) with the weight of the components of 1.22 and 1.00, respectively. All 2 variables are arranged in order of importance from least to greatest, namely, promoting activities that allow personnel to meet, exchange and build experiences from external organizations (ORM4) and adopt the Sufficiency Economy Philosophy in organizational management (ORM3) with component weights of 1.00 and 0.95, respectively.

The researcher then adjusted the composition and chose how to connect the arrow lines. It was the result of a Second Order Confirmatory Factor Analysis (S-CFA) to verify the structural validity of the gauge. After adjusting the components, it was found that $p = 0.09$, $CMIN/DF = 1.59$, $GFI = 0.99$ and $RMSEA = 0.02$, indicating that the model was consistent with the empirical data as shown in Figure 3.

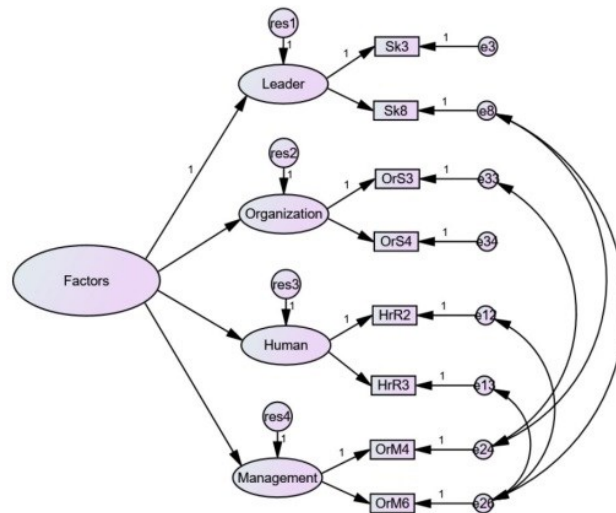


Figure 3 The results of the second corroborative component analysis (S-CFA) after model tuning. (Source : Researcher, 2022)

From Figure 3, when considering the weight of each component, it was found that the element weight was positive 0.26 - 1.26 with statistical significance at the .01 level. (Organization) has the most element weight equal to 1.26, followed by Organizational management (Management) has a component weight of 1.12, Leadership has a component weight of 1.00 and Human Resources (Human Resource) having a component weight of 0.26, respectively, with each component having confidence in the measurement (R^2) is between 0.01 - 0.15, indicating that all 4 components can be used as components to increase organizational management efficiency in education and the corroborative component model, the corroborative component analysis of the educational organization management optimization was consistent with the empirical data. Show that this model is structurally straight and all 8 variables are important variables of components of organizational management optimization in education.

Discussions

1. The results of a corroborative component analysis of the management optimization of educational organizations

It was found that all 40 variables used in the analysis could be grouped into 4 components from the elemental analysis by extracting the principal components and rotating the element axis with an acute angle by the Varimax method with a value greater than 1.00 for each component consisting of 6-11 variables. It has an element weight of 0.43 - 0.80. This adjusted element is named for its meaning. Consistent and encompassing a list of variables in

each component. The components whose weights are arranged in descending order include organizational structure, Human Resource, Organization Management and Leadership, respectively, in accordance with the research that used all 4 components of the Deming Cycle as a research hypothesis such as the research of Pothongsangarun & Kumplanon (2017) using the Deming Cycle as a model for the development of processes to optimize logistics management of the sugar industry group in Wangkanai factory. and Testa, Iraldo and Daddi (2018), summarized their research on the effectiveness of industrial environmental management tools in accordance with ISO 14001 or EMAS (Eco-Management and Audit Scheme). Ming used to create a tool to store information that the organization has better environmental performance and more incentives to invest in the environment. It is a key factor in achieving real efficiency improvements.

2. The results of the examination of the conformity between the constituent structure of industrial inventory management optimization and empirical data revealed that the confirmation component model, the confirmation component analysis of the industrial inventory management optimization, was significantly higher consistent with empirical data by the results of the first and second confirmation component analysis. It was found that the composition weight was positive. The first confirmatory component weight was between 0.72-0.87, was statistically significant at the .01 level, and the second confirmed constituent weight was between 0.86-0.91, was statistically significant at the .01 level. The harmonization between the model and the empirical data was obtained for $p = 0.46$, $CMIN/DF = 0.99$, $GFI = 0.99$ and $RMSEA = 0.00$, indicating that the validation component model, the confirmation component analysis of industrial inventory management optimization was consistent structural and all 8 variables are important parameters of the component of inventory management optimization in the industry. The components that have the weight in order from most to least are planning (Plan) with planning to reduce the overall cost and have a good coordination plan This is consistent with research by Goulielmos (2019) that describes the importance of cost (cost) planning for shipping companies. This research focuses on using strategies to reduce transportation costs by analyzing the structure of different departments related to the company's income and expenses. The result is cost reduction to a minimum and the research by Vlasenko (2021), summarizes the quality assurance control research. In-house coordination of entrepreneurial activities is a modern concept to support effective entrepreneurial activities. Strategic control fulfils the function of implementing plans and entrepreneurial goals. The main task is to coordinate strategic planning and control as well as provide information that is important to strategic decision-making. Operational controls will contribute to current planning, Implementation of plans (Do) such as increasing welfare for employees. This is consistent with research by Nagakumari & Pujitha (2021), which states that employers provide benefits other than wages or salaries to employees. For example, welfare will help raise the standard of living of employees. Employee satisfaction for efficiency and effectiveness can continue to achieve the goals of the organization assessment (Check) There is sufficient storage of products without problems with insufficient products to meet customer needs and can distribute products in a timely manner This is in line with research by Lin (2019), which said Wal-Mart's inventory management is an integral part of its internal control making it a

successful company. If the inventory turnover rate and total asset turnover are adjusted It can improve the economic efficiency of the business and research by Fatehi & Franza (2020) found the importance of timely production (Just-in-Time) that organizations cannot ignore and should be carefully addressed. Production should adopt Just-in-Time in their business and the last component Modifications (Act) should improve the workflow to be smooth with no interruption of production Let the disbursement and payment go smoothly. This is consistent with research by Susanto (2018), which states that inventory control is an activity that helps organize the availability of goods to customers. The primary function of inventory is to ensure a smooth response to customer needs. Customer demand affects inventory levels. Many organizations face the problem of more inventories leading to increased costs. The research section of Gupta (2019) found the importance of effective inventory-level management. By developing an economic order quantity model (EOQ) to determine the appropriate amount of inventory for raw materials that can be stored in limited quantities.

Conclusion and suggestions

Recruitment, appointment of knowledgeable personnel competency according to job position which is in this issue, it is consistent with society today, whether in the government or private sectors, in order to accept new employees or to find people to work in any position, which is clearly defined. Qualifications of those who come to work must have knowledge. What are your abilities? Initially, it will be checked based on educational qualifications, or inquire about work history or work certificates from other places. In order to confirm that the person who applied to work in that position has the knowledge and competence to do the job or not. All of them are human resources work.

Human Resources Behavior of personnel and groups of people within the organization that interact in the organization. As a result of the aforementioned elements, educational institutions, both government and private sectors, should pay attention. and deeply aware in management organizational structure organization management This element, if managed properly and systematically, would affect the behavior of personnel and people within that organization.

Moreover, this research is focus on the human resources in the educational field. There can help and develop the organization.

Suggestions for applying the research results

1 . The results of the research resulted in a component to optimize inventory management in the industrial sector. According to the components of the Deming Cycle. Therefore, the organization's executives can use this model to explore the organization according to the variables found to find strengths and weaknesses in the development of each variable.

2 . The results of the research found that various issues in the industrial inventory management optimization component must receive serious support from corporate executives.

Suggestions for future research

1. This research is a corroborative elemental analysis using Deming Cycle components only. If there is further research, the composition should be divided according to the ideas and theories of researchers or other scholars come to synthesize to obtain more comprehensive components according to actual conditions
2. This research is a study of the industrial sector in Thailand only. Therefore, the components of industrial inventory management optimization in other areas should be studied.

New knowledge and the effects on society and communities

It was the basis for solving various problems and was also an important basis for each individual when an individual with a good educational background can be combined into a cog to drive the prosperity of the country resulting in success in various fields, whether economically, socially and in all aspects, which will definitely lead the country to an international level. Everything that has been said depends on the effective management of education. Nowadays, the social and economic conditions of countries around the world are linked and more interdependent, planning and analyzing global economic trends society and politics. Including the development of human potential based on databases and statistics were very important and necessary for the development of the country towards sustainability and balance management.

There was new model to develop the organization and the society. There had the model of the education which focus on human resources. The good model can help the organization and the society.

References

- Arbuckle, J.L. (2013). *IBM SPSS Amos 22 User's Guide*. U.S.A. IBM Corporation.
- Department of Industrial Works. (2020). *Industrial statistics*. Retrieved from <https://www.diw.go.th/webdiw/static-fac/>
- Fatehi, K., & Franza, R. M. (2020). Systems considerations for adopting just-in-time production. *Journal of Competitiveness Studies*, 28(2), 143-157. <https://iblog.iup.edu/americansocietyforcompetitiveness/files/2021/05/JCS-Vol-28-2-2020-Table-of-Contents.pdf>
- Goulielmos, A. M. (2019). Plan the Business of a Vessel of a Tramp Shipping Company. *Modern Economy*, 10(06), 1633-1653. DOI: 10.4236/me.2019.106107
- Gupta, R. (2019). Reconciling service levels by customers on a non-constrained production line for raw material and finished goods inventory levels. Iowa State University Ames, Iowa
- Jackson, D. L. (2003). Revisiting Sample Size and Number of Parameter Estimates: Some Support for the N:q Hypothesis. *Structural Equation Modeling A Multidisciplinary Journal*, 10(1), 50 – 64. https://doi.org/10.1207/S15328007SEM1001_6

- Joshi, A., Kale, S., Chandel, S., & Pal, D.K. (2015). Likert scale: Explored and explained. *British. Journal of Applied Science & Technology*, 7(4), 396-403. DOI:10.9734/BJAST/2015/14975
- Kline, R. B. (2016). *Principles and Practice of Structural Equation Modeling*. (4thed.). New York, NY: The Guilford Press.
- Lin, R. (2019). The importance of successful inventory management to enterprises: A case study of Wal-Mart. In *2019 International Conference on Management, Finance and Social Sciences Research (MFSSR 2019)*. London: Francis Academic Press.
- Montri, T. (2015). *School curriculum administration of school administrators under the jurisdiction of the area office Secondary Education Area 16*. (Master Thesis, Hatyai University). (In Thai)
- Nagakumari, P., & Pujitha, N. S. (2021). Employee Welfare Measures in Manufacturing Industry. *The International journal of analytical and experimental modal analysis*, 13(8), 1153-1162. https://www.researchgate.net/publication/354562559_Employee_Welfare_Measures_in_Manufacturing_Industry
- Prachi, J. (2022). Organization Management - Meaning, Need and its Features. Retrieved December, 25th 2022. Retrive from <https://www.managementstudyguide.com/organization-management.htm>
- Pothongsangarun, T., & Kumplanon, N. (2017). Efficiency Enhancing of Logistics Management for the Sugar Industry Group: Case Study of Wangkanai Sugar Factory Group. *The Journal of KMUTNB*, 27(2), 371-378. <https://ph01.tci-thaijo.org/index.php/kmutnb-journal/article/view/166491/120258> (In Thai)
- Quangyen, T., & Yezhuang, T. (2013). Organizational Structure: Influencing Factors and Impact on a Firm. *American Journal of Industrial and Business Management*, 3(2), 229 – 236. DOI:10.4236/ajibm.2013.32028
- Schumacker, R. E., & Lomax, R. G. (2015). *A Beginner's Guide to Structural Equation Modeling*. (4thed.). New York, NY Routledge.
- Susanto, R. (2018). Raw material inventory control analysis with economic order quantity method. In *IOP Conference Series: Materials Science and Engineering*, 407(1), 012070. IOP Publishing.
- Turner, R. C., & Carlson, L. (2002). Index of Item Objective Congruence for Multiple Objective Measures. *Unpublished manuscript, University of Arkansas*.
- Wesley, C. (2022). Definition Human resource management (HRM). Retrive from <https://www.techtarget.com/searchhrsoftware/definition/human-resource-management-HRM>