

Performance of Aircraft Technicians: The Case of Indonesia

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This paper measures the relationship between learning achievement of aircraft technicians' program with the performance of aircraft technicians. The survey was carried out with the use of questionnaire to determine the learning achievement and performance of aircraft technicians. By this method, a positive relationship was observed to exist between the learning achievement of aircraft technicians' program and the performance of aircraft technicians. This condition suggests that the higher the learning achievement of aircraft technician program, the higher the levels of performance and the lower the learning achievement of the program, the lower the level of aircraft technician performance.

Keyword: Aircraft technician performance, learning achievement, aircraft technician program.

1. Introduction

Since the discovery of aircraft by the Wright Brothers about 100 years ago, the aviation sector has fundamentally changed the world. In 2015, the total number of aircraft passengers in Indonesia reached 82.5 million with flight details reaching 68.8 million domestic passengers and 13.7 million international flight passengers (Translog. 2016). Association of Asia-Pacific Airlines (AAPA) recorded that the number of passengers worldwide in 2013 was about 3 billion people. About 31% of the three billion airline passengers worldwide, are air-mobility passengers in the Asia-Pacific region only (IATA 2015).

Initially, air transport was a luxury item and was used only by the upper class citizens. This is because the number of airline operators are still very limited and the cost of flying is still fairly expensive. Therefore, the air transportation business is a prestigious business. Everyone involved, both the management, the pilots and the cabin crew get a high social status in public eye. Wensveen (2007) in Nusraningrum (2015) underlined that the growth of the air transport industry are universally extraordinary and the enormous role played by airlines in the national transportation system cannot be ignored. Deregulation of the airline industry in Indonesia started in the year 2000, when the government granted permission for the establishment of airlines, which include allowing new airlines fly the fat routes. Garuda Indonesia is the national airline of Indonesia, which flies to over 40 domestic destinations and 36 international destinations. Garuda Indonesia won the award by Skytrax for Best Regional Airlines in the World. Garuda Indonesia which flew for the first time in 1949, currently carries over 25 million passengers annually. The advanced technology used for the flight is an important factor that is needed. Repair and rejuvenation of plane is always done at certain periods. Another element is the determination of community flights tailored to the needs of service users.

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Public trust in an airline depends so much on the impression given by the overall performance of the company. A general understanding of the performance are the things that can give a good impression and experience by self-service users (passengers) on the overall service received. Low quality characteristics include, safety (security), schedule punctuality (flight schedule accuracy), promptness, comfort, fitness for use (conformity to customer requirements), and sociality. The aircraft can fly safely when supported by reliable and well-trained human resources (HR). One major function of human resources is to assist the aircraft technician who is in charge of preparing the aircraft to fly smoothly in accordance with a predetermined schedule. The aircraft technicians who conduct maintenance and repair of aircraft belonging to Garuda is currently under the auspices of PT GMF. Aero Asia is a subsidiary of PT Garuda Indonesia, which focuses on Maintenance & Repair Organization (MRO) business. It is located in Soekarno-Hatta International Airport.

In the aviation industry, services provided to public service users have flying indicators that are universally accepted by the whole aviation industry. In connection with the provision of this service, it cannot be separated from the moment of truth, the time and place, when and where. Producer services to the customer pertaining such things are also referred to as the moment of opportunity. Once the time elapse, the customer leaves the place, which makes it difficult to increase service quality (Grönroos, 1992). Grönroos (1992), as quoted by Albrecht gave some examples of the moment of truth that occurred in the aviation business; (a) customer calls the airline for information; (b) customer books the flight with the airline representative; (c) customer arrives at the airport counter; (f) ticket agent processes payment and issues ticket; (g) customer goes looking for the departure gate; (h) gate agent welcomes customer to the flight, validates boarding pass; (i) customer waits in departure lounge for flight to depart; (j) boarding agent takes customer's ticket and invites customer on board; (k) customer boards airplane, is greeted by flight attendant; (l) customer looks for his/her assigned seat; (m) customer looks for a place to stow carry-on luggage; (n) customer takes his/her seat. Safety of flight is one of the main requirements in the aviation business because it is a stiff competitive factor in the aviation industry and it involves the movement of passengers from one place to another. In the context of aviation safety, for an airline company rules on procedures that should be followed to achieve uniformity, passenger safety is regulated by the Agency or International Institutions such as ICAO (International Civil Aviation Organization) which is then translated into more specific rules in accordance with the prevailing conditions in the country. In Indonesia, rules on aviation safety is managed by the Directorate General of Air Communications (DGAC) and set forth in the regulation of civil aviation safety and the Civil Aviation Safety Regulations (CASR).

Among the challenges faced in civil aviation at the beginning of the 21st century, safety is considered as one of the most important factors. The demand for safety remains one of the topmost expectation of customers in addition to the service, choice of routes, schedules and frequency of flights, as well as ticket prices especially with "the WTC (World Trade Center)" on September 11, 2001. In addition, there have been changes in the competitive environment in the area of code sharing, alliances, and its dominance over global airline companies. Therefore, to be able to participate in the competition, airlines must inevitably participate. At the time the alliance grows and develops, the dominant partner will ask for a standard equivalent to its safety. Aviation safety supports the aviation business destination which is a major consideration in aviation. "Being safe (safe)" is not a business airline. Airline business is to transport passengers or cargo from one place to another with the

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purpose of making profit. However, airlines without flight safety will most likely be unable to get much passengers or a large profit in the long term. "WTC events" have proven to have an extraordinary impact on the deterioration of the aviation business.

The International Air Transport Association (IATA) released in 2014 the safety performance of commercial airlines, namely: the accident rate (measured in losses per one million flights) is 0.23, which is the lowest level in history and equivalent to one accident for every 4.4 million flights. This is an increase from 2013 when the global loss rate reached 0.41 (on the average, this implies one accident in every 2.4 million flights) and also an improvement over the duration of five years (2009-2013) of 0.58 accidents per million flights using jet aircraft. There were 12 fatal accidents involving all types of aircraft in 2014 with 641 fatalities, compared with an average of 19 fatal accidents and 517 deaths per year within the five-year period, 2009-2013 (IATA 2015). Causes of fatal accidents by decade (2000s); total pilot error 57% (pilot error 34%, weather related 18%, mechanical related 5%), other human error 6%, weather 6%, mechanical failure 22%, sabotage 9%, other causes 0% (planecrashinfo 2015). This data represents 1,015 fatal accidents involving commercial aircrafts in the world, from 1950 to 2010 of which the specific cause is known. Passenger aircraft has less than 18 military aircrafts, private planes and helicopters. "Error pilots (weather-related)" is an accident caused by weather phenomenon. "Pilot error (mechanically related)" is the main cause of accidents and it is due to mechanical failure. "Other Human error" include mistakes by air traffic controller, mistakes on air cargo, fuel contamination and improper maintenance procedures. Sabotage was reduced including explosive devices and piracy. (planecrashinfo 2015) Since most accidents occurred in developing or third world countries with rapid traffic growth combined with a large accident rate, it can be presumed that a drastic increase in accidents will occur if the accident rate is not suppressed. In this case, the main cause of the accident was human error in the industry due to lack of care or "human factors". Approximately 80% of accidents are not the fault of the pilot, but is a result of other factors for example, aircraft technicians or air traffic controllers.

Aircraft technicians' contribution to aviation safety can be seen in his behavior at work and his performance in the field of maintenance and repair of aircraft. Therefore, the learning achievement from the best technician program is expected to affect a technician in the mastery of knowledge and skills in the field of machinery, airframe, communications equipment, and aircraft instruments. The aircraft technicians' learning program is expected to influence and improve performance associated with the knowledge and skills required as an aircraft technician. Meanwhile, the type and number of aircraft to be prepared by the Garuda aircraft technicians are of various types, namely; 141 pieces of transporting more than 20 million people per year with the frequency of flights being 600 flights per day (indoaviation 2015).

The previous study found that there is a positive relationship between self-concept and performance of aircraft technician, it means more and better self-concept, as well as a higher performance of aircraft technician (Nusraningrum 2012). Aircraft technician's needs will continue to grow, thus, the first batch of the maintenance training program fuselage structure was held by Solo Technopark (STP) in conjunction with Garuda Maintenance Facility in 2012. The need for aircraft engineering personnel rose to 7,500 people. The training offered job opportunity for prospective technicians in aircraft maintenance. The high labor requirement in that field is as a result of the progress of the aviation sector in Indonesia. Indonesia currently lacks aircraft technicians. Of the need for 4,700 technicians,

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Indonesia only has 20 percent. With predictions in 2023, ASEAN requires 47 thousand aircraft technicians. Each ASEAN country require 4,700 aircraft technicians (sttkd 2015).

The above conditions led to the conclusion that the research on learning achievement from aircraft technician program with the aircraft technician performance is relevant. The purpose of this scientific paper is to analyse the relationship between learning achievement in the technician's program with the aircraft technicians performance.

Section 1 of this paper gives a brief introduction, section 2 discusses the theories relevant to the study and the performance of aircraft technicians: the case of indonesia, section 3 discusses the methodology, section 4 discusses the findings and section 5 discusses the summary and conclusions.

2. Literature Review

Armstrong and Baron (2005) stated that performance is a construct that is multidimensional, meaning that the dimensions consist of a variety of factors which can be seen from the quantity and quality of the process involving various components of activity at a certain period of time and not only as a result of that which occur at that point. Donald L. Kirkpatrick (2006) wrote that "performance" from the standpoint of improving employee performance through assessment and coaching are the conditions that will exist when segments of the work is done in an acceptable way. Although the difference between the "well done" and "acceptable" appears to be little, it is very significant. Work behavior will be directed towards achieving the objectives of the organization if there is clarity of responsibility. In this case, the responsibility is embedded in the job description as a contract of employment for people.

The performance of aircraft technicians can be measured by their conduct in carrying out their functions and duties. Someone who works as an aircraft technician is required to have relevant knowledge and skills to match the demands of his job. Although aircraft technicians have little input (as regards decision making) in the company's business, they are very important for the improvement of the aircraft business (Butler & Keller, 2000). Technical expertise is needed so the aircraft can still fly. In support of his duties, a technician must have basic knowledge of aircraft engineering and sufficient skills in the repair of aircraft. Basic knowledge about techniques, basic concept of an aircraft and on systems it supports are needed. Broadly speaking, it involves the basic concept of truth based on the questions of how and why the aircraft was made, how and why the aircraft is airborne and flight safety procedures.

This basic knowledge includes knowledge of the causes of an airplane being airborne, technological structure and life cycle of the aircraft, as well as knowledge of the system of the ATA (Air Transport Association) following the principles of operation. Mechanical aircraft cannot be separated from the theory of gravity, that is, all objects drawn to earth by a force proportional to the magnitude of the mass of the object. So that they may leave the surface of the earth, and sustainably maintain their existence or are on a fixed height above the earth's surface, the gravitational attraction that is attached to the object must be confronted with a force called lift. With the growing capabilities of the aircraft, aircraft engineering does not stop on a knowledge of mechanical engineering alone, but requires a wide range of support from various disciplines of basic and applied science in a more integrated manner. Understanding the underlying causes of aircraft being capable of flying

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is contained in the morphology and types of aircraft; aerodynamics the phenomenon of gravity (gravity); flight mechanisms, namely the forces that arise in the phases of different airlines, and aircraft formulation characteristics. Knowledge of how the planes fly having the characteristics of an airplane wing, airframe (fuselage), tail, the landing gear, propulsors, and flight controllers. (Aerospatiale Group, 2000).

Aircraft engineering is a specialized knowledge that comes from mechanical engineering that eventually becomes very complex because of various enrichment by different fields, such as industrial engineering, material science, physics, communications engineering, construction engineering, computer engineering, and so on. The integration of a variety of such knowledge provides an understanding of the structure of aircraft technology that includes the antagonism between the structure and safety of the weight of the aircraft, the types of wing structures and tank engines, the cell structure in the airframe (fuselage) and gains, structural balance, and differences in components that is used on airplanes. Knowledge of the structure of aircraft technology is very complex, and to facilitate its understanding it is divided into a variety of criteria that include control systems for flights, the hydraulic system, the system of electrification, the combustion system (fuel system), a system that prevents freezing (de-icing system), backup power generation unit (Auxiliary Power unit), the best kitchen furniture, an alloy in the cockpit, navigation system, automatic flying, communication systems, and others. Basic knowledge of engineering aircraft also includes an understanding of the driving engine aircraft, which comprise a general introduction about the driving force aircraft and utility aircraft engines, large thrust force generated as well as how to increase the number of machines used and placement in the plane. (Aerospatiale Group, 2000).

General matters concerning aircraft engines cover the types of engines, turbo-jet engines, engine rating and regulations, various systems on a machine that is connected with the aircraft (fuel system, lubrication system, ignition system ignition engines, pneumatics). Knowledge of the display aircraft engines, including common issues on propulsion aircraft, thrust and how to improve on it, the issue of weight, the number of machines required, the location of the machine, various types of airframe, knowledge of performance and working principle of the machine. Knowledge of aircraft engineering also includes an understanding of the life cycle of an aircraft. This knowledge includes "understanding how an aircraft is designed, manufactured and certified. Broadly speaking, the certification of aircraft includes an understanding of the test for certification testing on the runway and flight tests. Patterning and manufacturing of an aircraft requires industrial structure that includes the responsibilities and tasks of the partnership, both globally and regionally. Meanwhile, knowledge of production includes knowledge about organizations that carry out the functions of production, among others, engineering, planning and quality control. (Aerospatiale Group, 2000).

Aspects of the analysis, synthesis and evaluation demands the services of professionals. In this case, there are five requirements that must be met for someone to be a professional, namely; obtaining permission from the state to perform certain actions, a member organization of actors are the same, have the knowledge or skills estetik, has autonomy in doing his job, and vows to provide assistance to the needy. Therefore, the profession has a body of systematic theory, the skills and expertise achieved through a relatively long learning process. The learning process is directed towards carrying out "trouble shooting", which is a training in problem-solving with a fairly careful study. Therefore, the knowledge of aircraft is a fusion technique and application of knowledge that is highly complex, the

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mastery of knowledge and understanding. It involves a long process, and not everyone has the ability to absorb a "versatile". Thus, in accepting the development of knowledge and technology there is a tendency of specialization. Specialization aircraft engineering is possessed by the aircraft maintenance specialists in various fields. In this paper, the tasks performed by aircraft technicians is to ensure the sustainability of the airworthiness of aircraft, including methods and procedures for the overhaul, maintenance, inspection, repair and modification (components and equipment of an aircraft), in accordance with the methods listed in guide books and standards set by the airworthiness test.

Aircraft technicians are professional resources specializing in aircraft engineering. By understanding the theories and concepts of aircraft engineering, these specialists will be able to carry out their duties and responsibilities easily. Aircraft technician is someone who has knowledge of the terms, facts, principles, theories, structures, aerodynamics, fuselage (airframe), engine, the equipment used in aircraft (electronics, instruments, cooling system and electrical system), the basic rules of safety techniques and skills airplanes operate by in accordance with the demands of his job. The demands of the job of a field technician is to perform tasks, such as handling the arrival of the aircraft, troubleshooting to aircraft availability is limited, the decision maker's technical aircraft and announcing the plane's departure, the handling of flights, heating aircraft engines, supervision and modification of plane, showing care to a third party by declaring the aircraft's departure, inspections and an observer during flight test when necessary, to train and supervise subordinates, displacement, mounting panel/instrument for aircraft system as a whole, perform maintenance tasks for aircraft systems and system improvement lubrication, install and move the safety equipment in accordance with duties and responsibilities, perform tasks under the supervision of technicians with higher level, doing other tasks within the confines of qualifications and quality requirements of its system.

Performance evaluation are based on the performance of the job description which outlines the responsibility of each individual. As proposed by Schuler and Jackson (2003), performance assessment is carried out by (a) the criteria of the human nature that focus on the personal characteristics of an employee, such as loyalty, reliability, communication skills and leadership skills; (B) criteria based on behavior focus on what has been achieved or produced; and (c) criteria based on behavior focus on how work is carried out. Meanwhile, the best technician can be determined in various ways, as proposed (Robbins, 2006) by direct superiors, colleagues (peers), self (self evaluation), direct reports and a comprehensive approach. Each measurement technique has weaknesses and strengths, so no technique has perfect approach .

Therefore, the performance of aircraft technicians is determined by the intensity of the performance of duties and responsibilities as a technician, that can be demonstrated in carrying out activities including problem identification, monitoring, maintenance, and reporting.

Slameto (2007) described that learning is a process of one's efforts to acquire new behavioral changes as a whole, as a result of his own experience in interaction with their environment. In simple terms of understanding learning as propounded by the above opinion, an understanding of the nature of learning activity is a change that occurs within the individual. Meanwhile, according to Nurkancana (2006), learning achievement is the result of changes within the individual as a result of activity in learning.

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Achievement is the result of an activity that has been done, created both individually and in groups (Djamarah, 2010). He added that achievement is what has to be created, the results of a job, pleasing results are obtained with tenacity in the way of work. Learning outcomes shaped the behavioral changes that occur after an individual's specific learning activities. Changes that occur in cognitive abilities related to knowledge, psychomotor skills in performing task with the knowledge gained, or affection related to values or attitudes that would appear when people do something.

Learning is a relatively permanent change in behavior of organisms that occur as a result of their experience. That is why the argument stated that experience is the best teacher, given the fact that experience is a process that is obtained after an activity. The experience is an activity or action that is associated with a person's desire to carry out a particular activity. For example, a candidate for the best technician in the process of learning getting the best repair training by jumping directly to the field guided by an instructor. Therefore, the technician has completed the learning process and plunged to the real world of work, and has gained experience in aircraft repair. Learning is the process of getting a relatively permanent change in terms of attitudes, knowledge, information, skills and abilities.

The postulation by the study that intense exercise can cause changes in behavior is relatively sedentary because of their experience of doing an act for someone who is in the process of learning. Learning is a set of cognitive processes that change the nature of stimuli from the environment into several stages of processing the information necessary to acquire new capabilities. According to Gagne, 1992, certain prerequisites is needed in order to work well, and certain internal and external conditions need to be met. Studying mechanical means that learning is made or conditioned through stimulus or stimuli to produce a response that has been previously suspected. According to Bootzin and Semiawan, 2002, learning is the building (to construct) of knowledge itself, once it is understood, digested and becomes a part of ones life (from within).

Meanwhile, academic achievement program for aircraft technician, is not only influenced by the intellectual capabilities which are cognitive, but also influenced by factors such as non-cognitive, such as emotion, motivation, personality as well as a variety of environmental influences. With the various factors that affect the learning achievement of the best technician program, it can be said that the intellectual capabilities are cognitive characterized by Intelligence Quotient (IQ) and non-cognitive factors which include emotion, motivation, and personality marked by Emotional Intelligence (EQ). High intelligence and emotional intelligence has a role in learning achievement of aircraft technician program. However, every human being is born with different abilities, talents and interests, these three factors can also affect one's learning achievement. The learning achievement is the measure of a person who is carrying out the process of learning in terms of the successes recorded in the learning itself. The school system and also a lot of domestic life are often marked by ambition to realize the optimal achievement of learners. This is done because they merely want to look and find success in relation to the learning process.

There are two causes of someone's success or achievement, namely (1) the locus of intrinsic causes, including the ability, effort, and mood, such as fatigue and health; and (2) the locus of extrinsic causes, including whether or not the task is difficult, the good fortune (luck), and the help of others. Bloom, 1979 categorized learning outcomes into three

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domains , namely the cognitive, psychomotor, and attitude. Cognitive means paying attention to the development of individual capabilities and intellectual skills. Psychomotor relating to the activities of manipulative or motor skills. Semem tara realm attitude with regard to the development of feelings, attitudes, values and emotions are studied (new).

Aircraft technician who is the subject of writing is the best technician who served as base maintenance technician. An aircraft technician before declared as a technician had to undergo a series of education and training required by government regulations, the Directorate of Airworthiness Certification as well as the International Civil Aviation Organization. Once a candidate is declared a technician, he can be the best technician with the issuance of license by the awarding authority, and as the technician, he continues to receive special education and training according to the needs of PT Garuda Indonesia.

Thus, the definition of learning achievement in aircraft technician program is a result of business achieved in making behavioral changes based on the ability of aircraft technicians.

The learning achievement of aircraft technician program is a result of business achieved in changing behavior based on one's ability. Performance of aircraft technicians is the intensity of the duties and responsibilities as a technician that can be demonstrated in carrying out activities, including problem identification, monitoring, maintenance, and reporting. Of the construct of learning achievement of aircraft technicians program and the performance of aircraft technicians as noted above, the learning achievement by aircraft technicians program can be said to be a success in terms of learning the business and results achieved based on the ability of aircraft technicians in PT Garuda Indonesia, which result in behavioral changes in accordance with what had been understood and digested by the best technicians in the learning process. Meanwhile, the performance is an activity with a skilled work which can be supported by an adequate knowledge of the field work, confidence, and a strong urge to finish the job properly. The higher the ability, effort and interest to learn, the higher the learning achievement, it will have a higher morale and more productivity for performance to be increased.

The hypohthesis on this study is that there is a positive relationship between learning achievement of technician program with aircraft technicians performance. The higher the learning achievement of technician program, the higher will be the aircraft technicians performance.

3. The Methodology and Model

This study focuses on the relationship variable of learning achievement of technician program and a variable of aircraft technicians performance. Assessment of the above factors was achieved through a set of questionnaires that are designed and developed by the researchers to determine the learning achievement of technician program and the aircraft technician performance. From data such as the amount of each variable, statistical testing is done prior to further analysis. So that operational research was conducted with the aim to obtain an overview of the empirical; The relationship between learning achievement of technician program and performance of aircraft technicians was determined. This study uses survey with correlational approach and examines two variables, namely the learning achievement of technician program as independent variables and aircraft technicians performance as the dependent variable.

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The experiment was conducted at the Garuda Maintenance Facility (GMF) AeroAsia of PT Garuda Indonesia Jakarta. The target population in this study is the whole PT Garuda Indonesia aircraft technicians located in Jakarta, while the population covered as many as 202 people sampling frame Base Maintenance technicians. From the sampling frame was taken as many as 80 people, out of which 30 people were used to test the instruments and 50 people are for the study sample to fill out the questionnaire. Determination of the sample conducted by researchers is done in simple random sampling. In order to test for our hypothesis, we have conducted an empirical study and we have covered 50 aircraft technicians.

Data collection for this study included two variables: (1) the performance of the aircraft technician, and (2) learning achievement of technician program.

Measurement of performance variables of aircraft technicians using instruments based on the grille and indicators of the theoretical framework. Furthermore, grille and indicators set out in the form of statement items. Before an instrument is used as a data collection tool, it is first tested for validity and reliability .

To find out the validity of the instrument to see the grain size r obtained compared with the critical price r - Product Moment on $n = 30$. If r -count is greater or equal to r tables, grains are used to capture data. Conversely, if r is calculated $< r$ -table, the items are not used to capture research data. In the table of critical r -table prices Product Moment was found to be 0.361 for $n=30$ with $\alpha=0.05$.

Measurement of performance variables carried by the aircraft technicians shaped the instrument rating scale developed by researchers and filling out the questionnaires was carried out by the direct supervisor of the research respondents.

3.1 Instrument

Aircraft Technician Performance instrument development process begins with the development of indicators in the form of factual data that refers to the construct of Aircraft Technician Performance which form five alternative answers to the statement of 24 items. Each item statement is based on indicators of Aircraft Technician Performance as shown in Table 1 below.

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Table 1: Aircraft Technician Performance Indicator and Sub Indicator

No	Indicator	Sub Indicator
1.	Problem identification	1. Identify the damage. 2. Collect and process information. 3. Preparing manuals, spare parts, and equipment. 4. Recording. 5. Carry out tests and rectification.
2.	Monitoring	1. Looking for information on aircraft registration, estimated time of arrival or departure, parking lots, and the current overall condition of the aircraft. 2. Monitor the arrival and departure of aircraft using a hearing aid/headset. 3. Preparing worksheets, and other work equipment. 4. Overseeing aircraft modification process. 5. To coordinate with related units (such as the spare parts and so on) according to the type of task. 6. Make observations on the flight test aircraft.
3.	Maintenance	1. Install and remove safety devices. 2. The maintenance of aircraft. 3. Perform duties under the supervision of the direct supervisor.
4.	Reporting	1. Conduct briefings with the cockpit crew. 2. Conduct briefing with technicians who act as team work.

The instrument then tested on 30 respondents drawn from the framework of a random sample. Calibration process is done by analysing the trial data to test the validity of the instrument, in this case the validity of indicators, namely internal validity (criterion validity) using the correlation coefficient between score points with a total score of the instrument. Whole grains draft instrument tested the validity and reliability testing. The formula used is the Pearson Product Moment. To find out the validity of the instrument to see the grain size, r is obtained compared with the critical price of the Product Moment $r - n = 30$. If r -count is greater or equal t or tables, grains are used to capture data. Conversely, if r is calculated $< r$ -table, the items are not used to capture research data. In the table of critical r -table prices, Product Moment was found to be 0.361 for $n = 30$ with $\alpha = 0.05$. Based on the results of the calculations obtained, 27 test instruments are valid points and the reliability level instruments are 0.890.

The learning achievement of aircraft technicians program is the total score obtained from respondents through educational data and / or training programs of aircraft technicians for the education and training that is measured from the aspect of knowledge of technicians of the terms, facts, principles, theories, structures, aerodynamics, airframe, engine, electronics, instruments, cooling system, electrical system, and the basic rules of engineering aircraft safety. The end result of the learning achievement of aircraft technician program is the average of the value of graduation of respondents at the time of the last education and training, followed by aircraft technicians who were respondents in the study. Variable measurement of the learning achievement of aircraft technician program was not compiled by researchers considering that the education and training program is a program requirement to be a technician. For that the data obtained from the factual data is the data that has been recorded in the GMF, Directorate of Flight Safety Certification Department of Transportation and Garuda Aviation Training Education. The learning achievement data

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are netted aircraft technician program and used in this study is the learning achievement data of respondents which totaled 50 respondents.

4. The Findings

4.1 Variable Aircraft Technician Performance

Scores of the theoretical aircraft technicians performance ranges between 24 and 120, and based on the data accumulated scores of the aircraft technicians performance variable (Y) can be described, among other things the lowest score 69, highest score 110, range 41, mean 85.16, median of 84.23, 81.50 mode, standard deviation 9.83, skewness 0.636, kurtosis 0.077.

4.2 Variable Learning Achievement Aircraft Technician Program

Measurement scale of aircraft technician program variables are obtained using evaluation tools and training programs that have been conducted by Garuda Aviation Training and Education. The final score is obtained from the average value of aircraft technician program that has been provided. Based on the data, accumulated learning achievement scores of aircraft technician program (X) can be described, among others, the lowest score being 75, highest score 93, the range of scores 18, mean 86.88, median of 87.36, modus 88.00, standard deviation 3.88, skewness -0.563, kurtosis 0.457.

Based on the calculation, simple regression analysis of data variables of the learning achievement of aircraft technician program (X) with the performance of aircraft technicians (Y) generated a regression constant b of 1.425 and konstanta a amounted to -38.506. Thus, the relations between the two variables can be described by the regression equation, $\hat{Y} = -38.506 + 1,425X$. Before being used for predictive purposes, this regression equation should qualify linearity and significance.

The calculation of the regression \hat{Y} on X shows that $F_{\text{count}} > F_{\text{table}}$. It means that regression coefficient \hat{Y} on X is very significant with $\alpha = 0.01$. The linearity test is obtained as $F_{\text{count}} < F_{\text{table}}$, which shows linear regression. Thus, the regression equation $\hat{Y} = -38,506+1,425X$ can be used to predict the relationship between the learning achievement technician program (X) with the performance of aircraft technicians (Y). The regression equation implies that if the learning achievement technician program (X) improved by one unit, then the tendency of the performance of aircraft technicians increased by 1,425 units to a constant -38.506.

These findings conclude that the hypothesis of a positive relationship between the learning achievement of aircraft technician program and the aircraft technicians performance tested the truth. The strength of the relationship between the variables of learning achievement of aircraft technician program with the performance of aircraft technicians indicated by the correlation coefficient *Product Moment* $r_y = 0,562$ and the correlation coefficient significance test t-test price obtained t count equal to 4.704. This means that the more and better the learning achievement from aircraft technician program, the more the high-performance of aircraft technicians. Our findings suggest that the hypothesis of a positive relationship between the best learning achievement of technician program and aircraft technicians performance is verified. Referred to the coefficient of determination is the square of the correlation coefficient between X and Y, i.e $r_y^2 = 0.316$. This shows that the

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contribution of aircraft technician program to the learning achievement on the performance of the best technicians is 31.6%.

This finding is consistent with the theory study on learning achievements, that is, learning achievement is a result of business achieved by a person in a learning process that impact on behavioral change according to their ability to achieve the desired targets in this lesson. In this case, the best technician program has clearly had a target that someone who has been through this program will be skilled in carrying out his duties as aircraft technicians. A technician who has a good learning performance will have the skills to work better than someone who has a lower learning achievement. In addition, the education and training program also equip technicians with adequate knowledge to support the tasks. Thus, a technician with a high learning achievement from the technician's program will easily complete the task, so the intensity is higher performance compared with those with learning achievement of lower technician program.

5. Summary and Conclusions

This study provides evidence that shows a positive relationship between learning achievement of technician program and the best performing aircraft technicians. This condition suggests that the higher the learning achievement of the best technician program, the higher the level of performance. Conversely, it can be said that the lower the learning achievement, the lower air technician program performance. In order to improve learning achievement programs, flight technician education and training that can promote changes in three domains is necessary, namely changes in knowledge, attitudes, and skills that support the execution of their duties. His vast knowledge in the context of the duties of a technician will affect the confidence of technicians in the face of every problem related to their duties. A positive attitude will be a powerful incentive for each individual in the process of achieving goals both individual goals and objectives required by the company. Meanwhile, work skills in their respective sectors is an absolute requirement for a technician to be able to complete the task and responsibilities. With the implementation of a comprehensive education and training which includes three domains mentioned above, it will produce not only skilled technicians in performing duties but also will produce technicians responsive, sensitive and swift in dealing with any problems faced. In addition, a comprehensive education and training will be able to enhance the fighting power of technicians in completing each task at hand. Improved learning achievement from aircraft technician program is the necessary balanced education and training program that combines skills, attitudes and knowledge in accordance with the company's goals.

There are several limitations in this study. The first is that out of the 50 samples taken, the samples were only specifically in PT Garuda Maintenance Facility. However, the number of commercial airlines in Indonesia comprise of 17 companies. Therefore, studies using the grouping by industry should not take sample companies only from PT Garuda Indonesia. Another limitation is that the research on learning achievement from aircraft technician program is still limited to knowledge and skills. However, further studies may include the attitude of each technician. Therefore, attitude is the most fundamental thing that can drive a person to display meaningful skills and knowledge.

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