

Intellectual Quotient (IQ) Of National Selection To Enter State Universities (SNMPTN) Towards Academic Performances In Following Lecturing Process

Yusnadi*¹, Nani Barorah Nasution²,
Zuraidah Lubis³, Kamtini⁴

¹Faculty of Education, Universitas Negeri
Medan, Medan, Indonesia
Email: yusnadi@unimed.ac.id

²Faculty of Education, Universitas Negeri
Medan, Medan, Indonesia
Email: nanibarorah@unimed.ac.id

³Faculty of Education, Universitas Negeri
Medan, Medan, Indonesia
Email: zuraidalubis@unimed.ac.id

⁴Faculty of Education, Universitas Negeri
Medan, Medan, Indonesia
Email: kamtini@unimed.ac.id

Abstract

Intellectual quotient (IQ) is related to intelligence ability which might be used as a basis in measuring level of cognitive and predict learning performances of students. The focus of this study is identifying the relation between Intellectual Quotient (IQ) and academic performances of National Selection to Enter State Universities students. The purposive sampling was conducted to select the sampling. The subject of study includes the Faculty of Education students which are selected through university selection format or National Selection to Enter State Universities (SNMPTN). The quantitative method is conducted by analyzing correlation between Intellectual Quotient students towards university students' academic performances by using regression analysis. The data were collected by administered questionnaires and Intellectual Quotient (IQ) tests. The questionnaire is administered to collect the information of students' academic performances including general skill, work attitude, & personality. The

psychological tests consist of intelligence test, aptitude test, and interest test, which is administered to collect university students Intellectual Quotient (IQ) ability. The result shows the significance (sig.) value is 0.000 less than the probability value is 0.05. Strengthening the significance values result, the t test shows the t value is 16.180 which is greater than t table 1.665 means the H1 is accepted that students' academic performances were affected by Intellectual quotient (IQ). In conclusion, the intelligence quotient (IQ) has a great contribution towards SNMPTN students in the Faculty of Education academic performances.

Keywords: Intellectual Quotient, SNMPTN, Academic performances, University students

Introduction

University is the higher education institution and research institution which grants academic degrees and provides both undergraduate and postgraduate programs. Since the minister of Education, Nadiem Makarim, claimed that there will be a revolution in the selection process to enter state university, the issue of the recruitment process for prospective students to university has become an interest for several researchers. Currently, there are three methods used in the recruitment process for prospective students to be accepted in public universities, namely Seleksi Nasional Masuk Perguruan Tinggi Negeri (SNMPTN), Seleksi Bersama Masuk Perguruan Tinggi Negeri (SBMPTN), and institutional test or commonly known as Ujian Mandiri in Indonesia. The first selection method, SNMPTN, is notably recognized as its invitation for certain high school students who hold outstanding academic and non-academic achievement in their level of education. The second method, SBMPTN, is distinctively using a test in the selection process for recruiting the prospective students. In this process, all students across Indonesia will take the test and compete with each other to secure their place in a state university. While the third method is the institutional test in which the selection process is regulated by the university. However, each might have a different approach and assessment rule in recruiting prospective students for their universities.

New student admissions must adhere to the tenets of being credibility, fairness, transparency, flexibility, efficiency, accountability, and non-discriminatory for every prospective student. As the institute that provides

education for the community, universities admit applicants who have strong academic records and those who are expected to successfully complete their studies on time. So, the university provides the national selection entrance such as SNMPTN. In the process of selection in SNMPTN, universities can observe and validate the prospective academic achievements through website Pangkalan Data Sekolah dan Siswa (PDSS) initiated by the directorate of higher education institutions, the Ministry of Education. The existing data on the PDSS website is managed by the teachers and schools. Therefore, the honesty and integrity of teachers and schools are being a huge concern in this process. This national admission ensures that only students who continuously demonstrate their accomplishments in high schools or vocational institutions are given the chance to enroll as prospective students.

Intelligence is considered as an important factor for universities in accepting new students. It believes that the success of students during their study in higher education is determined by their intelligence. Intelligence refers to the capacity of students in possessing logical thinking, reasoning, critical thinking, problem solving, creativity, self-awareness, and emotional knowledge. Strengthen the claim, a study conducted by Siegel & Linder (1984) shows that intellectuality is important in determining someone's learning performances in higher educational levels which need to conduct higher order thinking skills. It concludes that intelligence is related to cognitive abilities and mental capabilities of learners. The use of PPDS (Pangkalan Data Sekolah dan Siswa) data for selecting prospective students is one way that universities conduct to evaluate pupil intelligence level through observing students cognitive achievement. This technique used for selecting prospective students is known as Data mining. Data Mining is the process of digging and analyzing a massive amount of data to obtain factual and useful information in which to understand the pattern of data (Han et al., 2011; Harwati & Miratama, 2016).

Recently, there have been several problems related to the SNMPTN student admission. First, SNMPTN admission uses an assessment of school grades based on report cards that better describe students' ability during high school. However, several people manipulate school grades for students to pass the requirement of entrance

selection. Second, the admissions process is far from transparent in which students do not have clear information about assessment criteria of SNMPTN. Third, previous studies have revealed differences in students' academic achievement based on the SBMPTN and SNMPTN. According to a study conducted in Gadjah Mada University, the average GPA of students who enrolled through the SBMPTN is higher than the SNMPTN. The other research conducted by Saputra (2016), the academic achievement of SNMPTN admission students has lower mean scores than SBMPTN admission students mean scores. The mean score of SNMPTN students is 2.8895, while the mean score of SBMPTN students is 2.9800.

According to the results of previous studies, it can be concluded that students with and without SNMPTN background have different competency in following the learning process. The individual competency itself cannot be separated by students' performance of intelligence (Brody, 1997; Gustafsson & Undheim, 1996; Robbins & Judge, 2013). In the context of this study, self-competency is seen as an ability to excel such skills and to do various tasks which are described from general abilities, work ethics, and attitudes during the lecture process. These competencies will certainly affect the graduates' quality from university. The best quality graduates will influence the standards of a quality education system. For instance, Finlandia which has been known for it is the best quality system of education. Finlandia believes that a teacher is the front liner to the existence of the country. Therefore, an individual must have a top notch quality and be qualified as a teacher. In order to produce a qualified teacher, it should begin with a selective recruitment system in their school of education to select top individuals to become teachers and educators in the future. Based on the data released by the Finland Government, the selection process to enter the teacher education program at University of Helsinki is more competitive than the law and health sciences program in 2016.

Therefore, from the problem and theoretical analysis in the background above, a study is needed to figure out the academic performance of university students with SNMPTN background by observing their attitudes in following the lecturing process in the faculty of Education. This study aims to determine the impact of

student intelligence quotient (IQ) towards academic performances (general skill, work attitude, and personality), and how the contribution of intellectual quotient towards the learning achievement and performances of students in the following learning process.

Methodology

This study is using a quantitative method. The quantitative method is conducted by analyzing correlation between Intellectual Quotient students towards students' academic performances (general skill, work attitude, & personal competencies) by using regression analysis. The data were collected by administered questionnaires and psychological tests. The questionnaire is administered to collect the information of students' academic performances including general skill, work attitude, & personal. The psychological tests consist of intelligence test, aptitude test, and interest test, which is administered to collect students Intellectual Quotient (IQ) ability.

The subjects were selected using a purposive random sampling technique. The sampling subject includes 96 students who entered the university through SNMPTN selection format (University National Entrance Test). The subjects were spread out through several study programs in the Faculty of Education including Community Education, Teacher Training for Primary Education, Early Childhood Education, and Educational Counseling.

Results

The academic performances of the university students were analyzed by measuring three latent variables including general skill, work attitude, & personal competencies. Each of latent variable is consist of observed variable, that is: (1) general skill (Intelligence, conceptual knowledge, analysis skills, comprehensive skills); (2) work attitude (work accuracy, working speed, work endurance, motivation); (3) personal competencies (self-confidence, adaptability, emotional stability, teamwork skills). These latent and observed variables are analyzed in finding how each observed variable can affect latent variables in representing the academic performances. The confirmatory factor analysis was administered to find the fit model among the latent and observed variables.

The CFA (Confirmatory Factor Analysis) were based on several fit indices values in interpreting the fit model including Model Chi-square, Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), and Goodness-of-fit index (GFI). The first model fit indices is chi square value shows 72,197 with the probability indices is 0.027 indicates the model is not fit ($p > 0.05$). The Root Mean Square Error of Approximation (RMSEA) value shows 0.066 which indicates that the model is fit (less than 0.08). CFI (Comparative Fit Index) showed 0.917 which is the recommended CFI index value is more than 0.90. The last indexes that we influenced the fit model are Goodness-of-fit statistic (GFI) shows the value is 0.90, the suggested value for GFI is more than 0.90 (Table 1). The figure 1 also shows more additional information about both variable factor loading.

Figure 1. Path Analysis Model of Academic Performances Indicator including general skill (KU), work-attitude (SK), & personal competencies (KP)

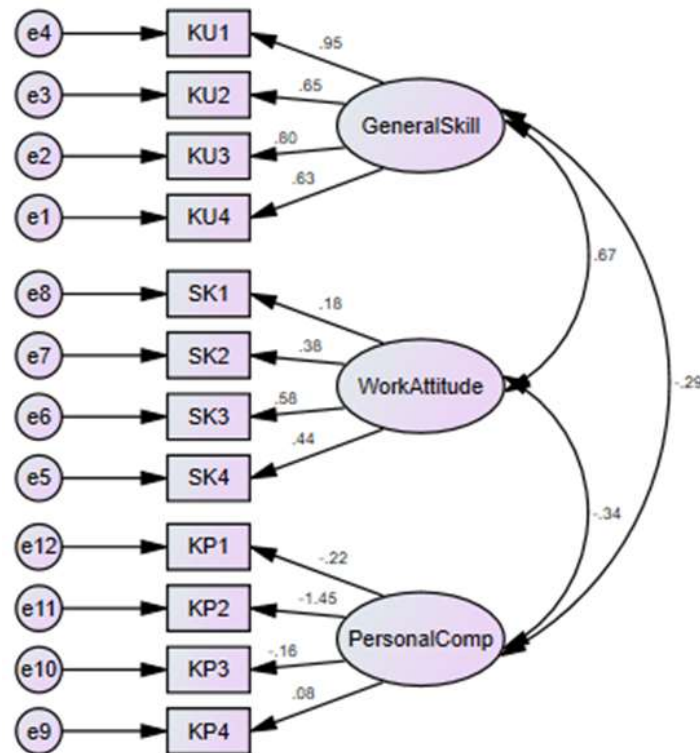


Table 1. Model of fit index

Model of Fit Index	Cut off Value	Index Result	Notes
χ^2 - Chi square	-	72.197	
Probability (P)	≥ 0.05	0.027	Not Good
Root Mean Square Error of Approximation (RMSEA)	≤ 0.08	0.066	Good
Comparative Fit Index (CFI)	≥ 0.90	0.917	Good
Goodness-of-fit index (GFI)	≥ 0.90	0.900	Good

The statistical analysis by The ANOVA table follows, and it shows how well the regression equation fits the data (predicts the dependent variable). According to **Table 2**, the regression model significantly predicts the dependent variable. The values also indicate that the overall regression model statistically significantly predicts the outcome variable. The regression significant value shows less than 0.05 (0.000) means it is a good fit for the data.

Table 2. Analysis of Covariance of IQ and Learning Performances

Model		Sum of Square	Df	Mean Square	F	Sig.
1	Regression	800.109	1	800.109	261.786	.000^b
	Residual	287.297	94	3.058		
	IQ	1087.406	95			

a. Dependent Variable: Performances

b. Predictors: Intellectual Quotient

Table 3. Coefficients Linear Regression of IQ and Learning Performances

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std Error	Beta		
1	(Constant)	2.349	1.859		1.264	.209
	IQ	.317	.020	.858	16.180	.000

a. Dependent Variable: Performances

Table 4. Result Summary of Regression of IQ and Learning Performances

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.858	.736	.733	1.74824

a. Dependent Variable: Performances

The Coefficients **Table 3** gives us the information we need to predict academic performance from Intellectual Quotient (IQ) and establish whether Intellectual Quotient (IQ) contributes statistically significantly to the model. Furthermore, we can present the regression equation using the values in the Unstandardized Coefficients. Constant value from unstandardized coefficient means the consistency values of dependent variables. This constant value is either positively or negatively affected by the independent variable value. The regression equation formula is $Y = a + bX$, where Y is dependent variable (performances) and X is Intellectual Quotient (IQ). The **Table 4** provides information to determine the effect of Intellectual Quotient (X) on university student academic performance (Y). This effect of independent variable toward dependent variable is based on the R square value.

Discussion

University is a higher education and research institution which is attended by students and awarded academic degrees for various academic disciplines. University is also known as a place of academic interaction, the circulation of thought, and place of creative idea dissemination. The university offers an education curriculum that consists of complex learning activities which require higher order thinking and skills. The higher the education level, the more challenging learning activity the student experiences. Consequently, the students attending the university level should possess a promising ability to conduct the learning process at the university level. The specific ability that learners need during their study at the university level is intellectual and physical ability. The intellectual ability is an ability to perform a mental activity such as thinking, analyzing, and problem solving. Whereas, physical ability is referring to the ability to perform tasks that require stamina, skill, strength, and similar characteristics (Robbins & Judge, 2013). At the university level, the students' learning activities can be carried out in the form of theoretical lectures, practical work, field work, or the combination of three forms. The theoretical lectures in the form of subject/course aims to examine student understanding towards the theories, principles, and concepts that are related to the field of study. Practical works aim to apply theory in limited conditions and situations, while fieldwork aims to apply theory in real situations.

The learning process at the university level requires students to optimize all the skills that students possess such cognitive, affective and psychomotor abilities in order to adapt to various lecture activities. However, the interviews conducted with several lecturers at the Faculty of Education Universitas Negeri Medan shows that some university students who were accepted through the SNMPTN format are facing difficulties in attending lectures. Moreover, the lecturer also admitted that the students who are accepted through the SNMPTN entrance format show a difference in learning performance with the students who have been accepted in University through the SBMPTN entrance format. The Students from SBMPTN are more able to adapt towards a various learning environment at university level. The study is conducted by involving university students who entered the university through SNMPTN format. The SNMPTN students were spread out through several study programs in the Faculty of Education including Community Education, Primary Teacher Education, Early Childhood Education, and Educational counseling.

The Confirmatory Factor Analysis of Academic Performances Variable

The academic performances were consist of 3 latent and observed variable that is (1) general skill (Intelligence, conceptual knowledge, analysis skills, comprehensive skills); (2) work attitude (work accuracy, working speed, work endurance, motivation); (3) personal competencies (self-confidence, adaptability, emotional stability, teamwork skills). The Confirmatory Factor Analysis was analyzed by checking the absolute fit indices and incremental fit indices. Absolute fit indices determine how well the a priori model fits the sample data and indicate which model has the best fit. This index provides the most basic indication of how well the proposed theory fits the data. The absolute fit indices include Chi-Squared, RMSEA, and GFI. According to the result of the first model fit indices is chi-square value shows 72,197 with the probability indices is 0.027 indicates the model is fit ($p \geq 0.05$). The Chi-Square value is a traditional measure for evaluating overall model fit (Hu & Bentler, 1999). The proper fit model will give insignificant results at the threshold of 0.05 (Barrett, 2007). The Chi-Square statistic is often referred to 'badness of fit'. The Chi-square is the most popular and it has some drawbacks, including: (1) this index assumes multivariate normality,

and violation of this assumption results in rejection of the model, even though the model may be correct; (2) The chi-square is primarily a test of statistical significance, it is highly affected by sample size (If the sample is too small, the trend will be non-significant, while if the sample is too large, the trend will be significant). Thus, chi-square will almost certainly reject the model if a large sample is used.

The Root mean square error of approximation (RMSEA) index is considered as the 'one of the most informative fit indices'. The RMSEA indices has the sensitivity to the number of parameters estimated in the model. One of the biggest advantages of the RMSEA indices have a confidence interval. The RMSEA value shows 0.066 which indicates that the model is fit (less than 0.08). The Goodness-of-Fit (GFI) tends to increase by the increase of the parameters number. Moreover, it also has an overestimation with a large number of samples. The accepted minimum threshold of GFI is 0.90. However, the studies have shown that a higher cut-off of 0.95 is more appropriate (J. N. Miles & Shevlin, 1998). According to the results of studies, the fit model's Goodness-of-fit statistic (GFI) shows the value is 0.90.

Incremental fit indices, known as comparative fit index (J. Miles & Shevlin, 2007) or relative fit indices (McDonald & Ho, 2002). This index is categorized as the indices that do not use chi-square in their raw form but compare chi-square values with the underlying model. The incremental fit indices used in this CFA is CFI (Comparative Fit Index). The CFI is the most popular measure index because it is the least affected by the sample size. This study shows that the CFI value of the model is 0.917 which is the recommended CFI index value is more than 0.90.

As a result, the study confirms the majority of fit indices are showing that the model has good fit. However, the chi-square probability shows the indices values are not good. This assumption is because the chi-square probability value is depending on the number of samples, in which the value tends to insignificant when the sample is small. The other indices such RMSEA, CGI, and CFI are assuming the model is fit. However, the loading factor is not good enough for several latent variables. The loading factor is the correlation between the indicators and their latent constructs. According to Hair et al. (2009), the

acceptable value of factor loading should be adjusted based on the number of samples used. The study involves about 98 university students which means the acceptable value for factor loading is 0.55.

The impact of Intellectual Quotient (IQ) towards Academic Performances of SNMPTN Students

Intelligence is one of numerous factors and plays an important role in determining learning achievement. Intelligence is known as a cognitive ability to solve problems and respond to difficulties. Intelligence has a great influence on learner achievement and performances (Slameto, 2013). Intelligence is known as a basic factor that predicts academic achievement in schools. Moreover, intelligence also plays an important role in influencing students' future career (Kuncel et al., 2004). Intelligence is a fundamental thing for the human learning process. It has a role in learning new information or knowledge which is later used as a basis on solving the problem. Intelligence is closely related to individual cognitive abilities such as thinking, remembering, reading, learning, problem solving and the use of language. Intelligence can be measured using a psychometric tool commonly referred to as an intellectual intelligence test (IQ).

Measuring Intellectual quotient (IQ) has been a concern of psychologists during the last centuries. The IQ test was discovered by French Psychologist Alfred Binet and Theodore Simon in 1905. The test was developed to provide meaningful data about children's intellectual ability in detecting their learning problem. Intellectual quotient test has been defined as a method test to assess human mental age (Rakhmanov et al., 2021). The learner who possessed a high level of intellectual quotient (IQ) shows outstanding performance in schools rather than learner with low Intellectual quotient (IQ) (Coyle & Pillow, 2008). The Intellectual Quotient test is typically an aptitude test which is determining skill or a person's tendency to succeed in certain activities. Intellectual Quotient tests mostly used in conjunction with achievement tests. Achievement tests are designed to measure learner achievement on a particular learning subject such mathematics, language, science concepts etc, in which the test was arranged with item questions that have varying difficulty. On the other hand, the Intellectual Quotient test is used to diagnose cognitive

phenomena (Braaten & Norman, 2006). Several researchers and psychometricians are accepting Intellectual quotient (IQ) tests as a statistically reliable and valid tool in applying a different type of clinical purposes (Anastasia, 2010; Rakhmanov et al., 2021).

Several studies are attempting to analyze factors that affect students' academic performances including learning environment, teaching method, learning style, academic motivation, social motivation, parental factor, gender, age, economic status, instructional media used and learning facilities, learning course/subject, tuition fee, study hour, and teacher/tutor/lecturer character (Al-Qahtani, 2015; Ali et al., 2013; Johnson Chinedum, 2020; Kolb & Goldman, 1973; Wentzel & Wigfield, 1998). This study would like to perform a study which is focusing on how massive the contribution of intellectual quotient (IQ) towards academic performances. Academic performances relate to the evaluation of student performance in a range of academic areas.

This study is identifying the intellectual quotient impact towards learning performances of university students who enroll to the Universitas Negeri Medan through SNMPTN admission format. The result shows the constant value of the unstandardized coefficient is 2.349, which is the standard values of student academic performances. While the value coefficient regression is 0.317 means the 1% higher IQ score the academic performance has increased about 0.317. According to the positive value of coefficient regression means that the higher the intellectual quotient, it positively affects the academic performances of learners.

Testing our hypothesis about the impact of intellectual quotient (IQ) towards academic performances. The result shows the significance (sig.) value is 0.000 less than the probability value is 0.05. Strengthening the significance values result, the t-test shows the t-value is 16.180 which is greater than t table 1.665 means the H1 is accepted that students' academic performances were affected by Intellectual quotient (IQ). According to the expert and other researchers, they mentioned that the Intellectual Quotient (IQ) has been used as the indicator to determine individual cognitive function. However, intelligence and performance are different things, but intelligence and performance have strong correlation (Iqbal et al., 2021). The result of empiric study shows that the Intellectual

Quotient (IQ) is one of factors that affected learner academic performances during the learning process (Fitriana et al., 2017; Richardson & Norgate, 2015). The result also claimed that the learners who enroll by SNMPTN enrollment format are well-performed during their undergraduate program in Universitas Negeri Medan.

After assessing the correlation of intellectual quotient (IQ) and learners academic performances, the researcher also attempted to assess how big the contribution of intellectual quotient in supporting learner academic performances. The contribution of intellectual quotient can be assessed by checking the R square value which shows the correlation index is 0.736. This value means that the intellectual quotient (IQ) has affected students' academic performances in the Faculty of Education about 73.5 percent, while 26.5 percent is affected by the other external variables. The contribution of intellectual quotient also shows by several previous studies which shows that Intellectual Quotient (IQ) were providing a contribution of about 50 percent towards students' learning achievements (Pratama & Corebima, 2015). However, the relation between Intellectual quotient of students and their academic performances could vary depending on learner academic development and their learning environment (Kyttala & Lehto, 2008). As was previously mentioned, there is a chance that the characteristics of the students, background, student surrounding environment, instructional method, learning media, learning style, academic and social motivation were becoming other factors which contributed to academic performance for SNMPTN students in Universitas Negeri Medan.

Conclusion

In the last centuries, the intellectual quotient test is becoming standard to assess individual cognitive ability. Majority of psychologists and educational experts use Intellectual quotient (IQ) test scores as the standard to assess educational performances and predict learner future success. This study is focusing on determining the impact of student intelligence quotient (IQ) towards academic performances (general skill, work attitude, and personality), and how the contribution of intellectual quotient towards the learning achievement and performances of students in the following learning

process. The result shows that the level of intellectual quotient (IQ) of SNMPTN (Seleksi Nasional Masuk Perguruan Tinggi Negeri) students is positively affected by their academic performances. Moreover, the intellectual quotient has a high contribution to SNMPTN students' academic performances.

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