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Unika SOEGIJAPRANATA

SURAT TUGAS

Nomor : 0982A-e / F.7.1 / FP / VI / 2022

Dekan Fakultas Psikologi Universitas Katolik Soegijapranata Semarang memberikan tugas kepada yang tersebut dibawah ini :

Nama	:	**Terlampir**
Status	:	Dosen Fakultas Psikologi Universitas Katolik Soegijapranata
Tugas	:	Sebagai Oral Presenter The 2nd International Conference on Biopsychosocial Issues (IconBi 2022)
Waktu	:	23 s.d 24 Juni 2022
Tempat	:	Ruang Theater Gd. Thomas Aquinas UNIKA Soegijapranata
Lain – lain	:	Harap melaksanakan tugas dengan sebaik – baiknya dan penuh rasa tanggung jawab

Demikian surat tugas ini dibuat untuk diketahui dan dipergunakan sebagaimana mestinya.

Semarang, 17 Juni 2022
Dekan,

Dr. Margaretha Sih Setija Utami, M.Kes.
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Unika SOEGIJAPRANATA

Lampiran : Surat Tugas

Nomor : 0982A-e / F.7.1 / FP / VI / 2022
Tanggal : 17 Juni 2022

Oral Presenter
"The Second International Conference on Biopsychosocial Issues 2022 (ICONBI 2022)"

NAMA	JUDUL PAPER
Dr. A. Rachmad Djati Winarno, MS.	Students Digital Health Literacy And Health Situation
Dr. Augustina Sulastri, S.Psi.	Assessing Predictors Of Academic Stress Among Students At The Final Year: Coping Stress, Learned Helplessness, And Self-Control. Pathways On Adapting Neuropsychological Tests In Multi-Language And Multi-Cultural Countries: Exploring Strategies And Challenges
C.V.R. Abimanyu, S.Psi., M.Psi.	Age Effect On Verbal Auditory Memory And Visual Memory Performance In Indonesian Elderly
Dr. Christin Wibhowo, S.Psi., M.Si.	Decreasing Borderline Personality Disorder: Ramayana-Based Counselling Design
Daniswara Agusta Wijaya, S.Psi., M.Psi.	Children Neuropsychological Tests Adaptation In Non-Native English Speaking Countries: Literature Review On Methods And Challenges
Dr. Endang Widyorini, M.S.	Executive Function And Academic Performance
Eugenius T. Reinaldi, S.Psi., M.Psi.	Psychometric Properties Of Indonesian-Adapted Gratitude Questionnaire
Dr. Lucia Hernawati, M.S.	Health Promotion Through Schools During The Covid-19 Pandemic
Lucia Trisni Widhianingtanti, S.Psi., M.Si.	Examining Sex-Based Differences In Executive Function Among Healthy Adults
Maria Bramanwidyantari, S.Psi., M.A.	Assessing The Relationship Of Parenting Style And Family Health
Dra. R.A. Praharesti Eriany, M.Si.	Dimension Of Fraud Triangle And Academic Integrity During Online Learning On Undergraduate Students
Widawati Hapsari, S.Psi., M.Si.	Are You Happy? A Study Of Happiness In A Semarang Private University Predictors Of Entrepreneurial Intention In Credit Union

Semarang, 17 Juni 2022
Dekan,

Dr. M. Sih Setija Utami, M.Kes.
NPP. 3811990068

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Endang Widyorini Psikolog

as an Oral Presenter

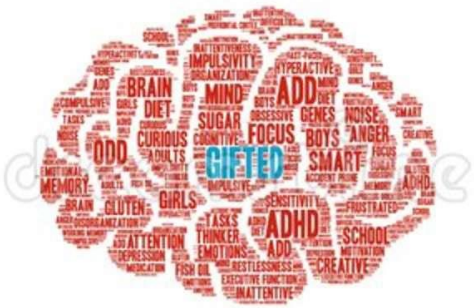
The 2nd International Conference on Biopsychosocial Issues
(IConBI 2022)
Thursday - Friday, 23 - 24 June 2022

Eugenius Tintus Reinaldi, M.Psi., Psikolog
Head of IConBI 2022 Committee

Dr. Margaretha Sih Setija Utami, M.Kes
Dean of the Psychology Faculty SCU

EXECUTIVE FUNCTION AND ACADEMIC PERFORMANCE ON GIFTED ADOLESCENTS

Endang Widyorini
Psychology Faculty of SCU



According to the National Association for Gifted Children (2010), a gifted student is someone who has high potential and ability in one or more areas.

Some experts emphasize that a gifted student has a higher intellectual capacity ability than his peers in his age and class." According to this definition, gifted students are people who have the potential to show a higher level of progress, compared to their peers. Gifted students are more successful in academics

Gifted students are more successful in academics
(Johnsen, 2012)

but there are, some facts exist

some of these gifted students have low achievement, the question arises what happens to some gifted students who are not able to demonstrate their abilities and competencies?

Sometimes, motivation is low and they are less able to manage themselves in doing tasks.

They have high intelligence and talent but show poor academic performance

Taghinejad suggests three important reasons that why some gifted students succeed less than expected:
(1) lack of motivation for school-based learning,
(2) environments that do not nurture their talents, and
(3) neuropsychological problems (learning disorders, attention deficit, memory deficit, and executive dysfunction)

The executive function (EF) plays a important role in maintaining and developing academic skills and general school performance; however, few studies directly target EF as a predictor and/or correlation with school readiness.

In recent decades, particular emphasis has been placed on executive functions in psychology and neuroscience (Zelazo et al. 2016); these being understood as superior cognitive functions that control and regulate the most basic cognitive processes (Corso, Sperb, de Jou, & Salles, 2013).

The EF model proposed by Miyake (2000), there are three main EF dimensions: **update, set-shifting, and inhibition.** This EF represents an important ingredient for optimal academic functioning, and is also one of the most important potential sources of school dysfunction, because EF deficits correlate with learning ability in both mathematics and reading

Diamond (2013) mentions three main factors or cognitive functions: namely, Working Memory, Inhibitory Control (behavioural self-control and cognitive inhibition), and Cognitive Flexibility. ***Working Memory*** is responsible for the maintenance and processing of previously acquired information; ***inhibitory control*** involves the action of pondering and not acting at a cognitive and/or behavioural level in impulsive manner. ***Cognitive flexibility*** is the factor that supports the analysis of multiple perspectives and possible approaches to a problem by adjusting to its own and contextual conditions

The general objectives of this study is to determine whether EF has a correlation with academic performance of gifted student, and The relationship of each component of executive function, namely cognitive flexibility, inhibitory control and working memory with the academic performance of gifted students.

HIPOTHESES

1. There is a positive relationship between executive function and academic performance in gifted youth.
2. There is a positive relationship between cognitive flexibility and mathematics learning achievement.
3. There is a positive relationship between Inhibitory control and academic performance
4. There is a positive relationship between working memory (with digit span backward score and digit span sequencing score) and academic performance

Method

This study uses quantitative research methods, with purposive sampling technique. participants are special class students for gifted students, they have been identified as gifted children by psychologists at the time of selection to enter school

Participants

A total partisipants were 82 students from 7th-the 8th grades of special class for gifted students of yunior secondary schools in Semarang, 39 girls dan 43 boys, their age about 12-15 years old.

Instrumens

a**. Executive Function**

Executive function is a cognitive skill that is responsible for setting goals, guiding, directing, organizing, and managing goal-oriented cognitive, emotional, and behavioural processes. FE data collection using a neuropsychological test tool, namely the Wisconsin Card Sorting Test (WCST).

b**. Cognitive Flexibility**

The measuring instrument used to measure shifting or cognitive flexibility is the Trail Making Test (TMT) part A & B. Part A, in the form of numbers. Part B contains numbers and letters. Parts A and B both measure the speed of information processing. In addition, section B specifically measures cognitive flexibility.

c**. Inhibitory Control**

Measurement of inhibitory control will use the stroop test. Stroop Color and Word Test (SCWT) This test measures a person's ability to inhibit cognitive processing disorders while processing a stimulus that affects the simultaneous processing of other attributes of the same stimulus

d. Working memory (Updating)

Measurement of working memory ability will use a digit span test. The digit span test that will be used is digit forward, digit backward and digit sequencing

e. **Academic performance** data is obtained from the scores of mathematics, physics, Indonesian, English, and social sciences in the mid-semester test scores. It is assumed that the mid-semester score used as a sample can already represent academic performance

Statistics Analysis

This study uses a quantitative approach with a correlational. The research variables include executive function (EF) as the independent variable and academic performance as the dependent variable.

- For the first hypothesis, to determine the correlation between EF (data obtained from scores obtained by WSCT) and academic performance using Pearson Correlation (product moment).
- The second to fourth hypotheses were tested using the Pearson Correlation (product moment) method. The aim is to determine the level of relationship of each variable X from the component of executive function, namely the second hypothesis of this study with academic performance.
- The third hypothesis, namely Inhibitory Control with Academic Performance.
- The fourth hypothesis is Working Memory (*digit span backward & digit span sequencing)* with academic performance. The correlation test on the fourth hypothesis will first change the range of *digit span backward* dan *sequencing* score becomes a Z score value then the results are averaged. These results will be used in the correlation.

Results

- The results **showed a significant correlation** between executive function and academic performance in gifted children ($r=0.104$; $p<0.05$).
- The results of the second hypothesis analysis test showed that **there was no correlation between** cognitive flexibility and academic performance in gifted students (p value = 0.223, > 0.05),
- The third hypothesis using Pearson correlation analysis. Results of the analysis obtained Pearson correlation value rxy = -0.615 with a significance value of p = 0.000. These results indicate that **there is a very significant negative correlation between inhibitory control and academic achievement** in gifted students. Based on these results, the third hypothesis proposed is accepted.
- The results of the fourth analysis obtained the Pearson correlation value rxy = 0.458 with a significance value of p = 0.001. These results indicate that there **is a very significant correlation** between working memory (Digit Span Backwards and Sequencing) with academic performance in gifted students.

DISCUSSION

The first hypothesis in this study is that there is a relationship between executive function and learning achievement in junior high school students. Edel (2003) Academic performance is “a construct that can have quantitative and qualitative values, and these values provide some evidence and a profile of the skills, knowledge, attitudes and values developed by the student in the teaching-learning process”, then brain function is very important to understand how this process takes place. Neuropsychological findings in this area are very useful in explaining this relationship (Rosen et al., 2018).

Zelazo and Carlson (2012), educational research should focus on executive function because it is the basis for language development and thus for literacy (the basis for learning) as well as for the processing and organization of received information. explanation of it,

according to Sesma et al. (2009) and Zelazo and Carlson (2012), research on academic achievement in education should focus on executive function because it is the basis for language development and thus for literacy (the basis for learning) as well as for processing and organization of received information.

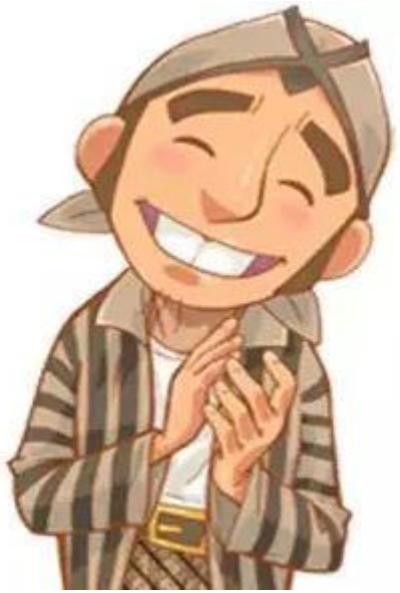
Executive functions but reach as distinct, related, higher-order neurocognitive processes that control thoughts and behaviour aimed at achieving a goal or goal (Zelazo and Carlson, 2012)

Therefore, they arranged cognitive and emotional behaviour and activities through set of adaptive abilities. These functions include working memory (the ability to manipulate information), inhibition (impulse control), cognitive flexibility (ability to come up with different solutions to a problem) and planning (development of a strategy to achieve a goal); that The previous functions are all considered to be the basic process of this variable (Anderson, 2002).

The results of this study suggest that gifted students show a superior performance than the group of regular students in the executive functions of Working Memory and Cognitive Flexibility, as well as in the higher functions of Reasoning and Problem Solving.

The results of this study show that there is no relationship between CF and EF, while previous studies have shown the opposite. Children with high capacities present better cognitive flexibility in the analysis and processing of information, with an impact on their own learning abilities (Ropovik, 2014; Vaivre-Douret, 2011). It is possible that the curriculum in Indonesia emphasizes memorization, not demanding creativity in learning.

THANK YOU



IConBI2022 LOA Inbox

C COSY 2021 May 27
to me

Dear Author(s),

Thank you for your abstract submission to IConBI2022. Based on the scientific committee's review, we are pleased to inform you that your abstract submission is accepted (Accept With Minor Revision) for presentation at IConBI2022.
If you want to see comments of your abstract, kindly check at your submission dashboard :
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Please submit your full paper before , via CoSy at paper submission dashboard here :
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The final decision on your manuscript will depend on your response to the reviewers' comments, as per the journal editorial system guidance.

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Do let us know if you have any queries (https://wa.me/6281326725573). Thank you. We look forward to your attendance at IConBI2022.

Thank you.

EXECUTIVE FUNCTION AND ACADEMIC PERFORMANCE ON GIFTED ADOLESCENTS

Endang Widyorini

Psychology Faculty of SCU

Abstrak

Penelitian ini bertujuan untuk mengetahui hubungan antara fungsi eksekutif dengan prestasi belajar remaja gifted sekolah menengah pertama. Variabel fungsi eksekutif terdiri atas tiga komponen yaitu fleksibilitas kognitif, *inhibitory control* dan memori kerja. Hipotesis penelitian ini adalah (1) Terdapat hubungan antara fungsi eksekutif dengan prestasi belajar siswa SMP (2) Terdapat hubungan yang positif antara fleksibilitas kognitif dengan prestasi belajar matematika pada siswa SMP. (3) Terdapat hubungan yang positif antara *Inhibitory control* dengan prestasi belajar matematika pada siswa SMP (4) Terdapat hubungan yang positif antara memori kerja (dengan skor *digit span backward)* dengan prestasi belajar matematika pada siswa SMP (5) Terdapat hubungan yang positif antara memori kerja (dengan skor *digit span sequencing)* dengan prestasi belajar matematika pada siswa SMP. Partisipan dalam penelitian ini sebanyak 41 orang siswa yang tersedia secara insidental pada SMP Terang Bangsa. Pengambilan data dilakukan dengan pengukuran aspek fungsi eksekutif yaitu menggunakan *Trail Making Test* (TMT A & B) secara *paper and pencil, Stroop test* online pada Psytoolkit.org, dan *Digit Span Backward and Sequencing* secara *paper and pencil.* Prestasi belajar matematika menggunakan nilai UTS matematika. Hasil analisis data menunjukkan bahwa hipotesis pertama diterima. Fungsi eksekutif dapat memprediksi prestasi belajar matematika secara signifikan (R=0,640; p<0,001). Analisis korelasi menunjukkan bahwa fleksibilitas kognitif tidak memiliki korelasi dengan prestasi belajar matematika, sementara *Inhibitory control* berkorelasi (r_{xy}= -0,575*; p* =0,000) dan memori kerja memiliki korelasi (r_{xy}= -0,506*; p* =0,001) dengan prestasi belajar matematika.

Kata Kunci : prestasi belajar, fungsi eksekutif, fleksibilitas kognitif, *Inhibitory control*, memori kerja.

EXECUTIVE FUNCTION AND ACADEMIC PERFORMANCE ON GIFTED ADOLESCENTS

Abstract

This study aims to determine the relationship between executive functions with academic performance of junior high school students. The executive function variable consists of three components, namely cognitive flexibility, inhibitory control and working memory. The hypothesis of this study are (1) There is a relationship between executive function and academic performance in junior high school students (2) There is a positive relationship between cognitive flexibility and academic performance in junior high school students. (3) There is a positive relationship between Inhibitory control and academic performance in junior high school students (4) There is a positive relationship between working memory (with span backward digit scores) and academic performance in junior high school students (5) There is a positive relationship between working memory (with digit span sequencing scores) with academic performance in junior high school students. Participants in this study were 41 students who were available Junior High School. Data is collected by measuring

aspects of executive functions; Trail Making Test (TMT A & B) using paper and pencil method, online Stroop test at Psytoolkit.org, with Backward and Sequencing Digit Span by using paper and pencil. Academic performance using midterm exam mathematics scores. The results of data analysis show that the first hypothesis was accepted. The executive function can predict academic performance significantly (R = 0.640; p <0.001). Correlation analysis shows that cognitive flexibility has no correlation with academic performance, while Inhibitory control is correlated (r_{xy} = -0.575; p = 0,000) and working memory has a correlation (r_{xy} = -0.506; p = 0.001) with academic performance.
Keywords: Executive Function, academic performance, adolescents gifted

Introduction

Academic performance is an indication of how much change (for example understanding and behavior) occurs in students after going through a learning process (Hamalik, 2012). When students pursue formal education, academic performance is an important indicator that shows their success in pursuing formal education. Therefore, academic performance has become a quite popular problem that worries students, teachers and parents. For students, academic performance can provide information about the extent to which they have succeeded in following lessons, the results can be satisfactory or unsatisfactory. For teachers, student academic performances can be used as material for evaluating their teaching materials and methods. Meanwhile, for schools, academic performance can be used to evaluate the school learning climate, curriculum, and compliance with school standards (Arikunto, 2015).

According to kompas.com (15 December 2016), students in Indonesia who have 1,095 hours of lessons per year have a very low education quality rating when compared to South Korea which has 903 hours of lessons per year and Japan with 712 hours of lessons per year. able to bring its students to the top of the world rankings. The Head of Puspendik, Prof. Nizam, said that students in Indonesia showed good results in working on rote questions. However, the application and reasoning methods are still low. The learning process at school, which consists of daily tests and school exams, has not been able to improve students' reasoning processes. Nizam believes that currently the national exam still contains too many students. The results of the Indonesian National Assessment Program (Competency Level Quality Assessment) in 2016 show that elementary school students' high-level thinking abilities are still weak. Therefore, according to Rahmah Zulaiha, (Puspendik researcher), students should practice doing non-routine tasks/questions a lot, the learning process is assisted with educational teaching aids, and teachers develop methods that further encourage reasoning abilities during learning and assessment.

The information in the daily Kompas above indicates that the learning achievement results achieved by students in Indonesia do not yet cover all domains of cognitive skills completely. Students in Indonesia are only able to be at the initial stage, namely recognizing and remembering. The next stages such as understanding, application, analysis, synthesis and evaluation (Arikunto, 2015) have not been mastered by students well. This is very much in line with Rahmah Zulaiha's opinion that Indonesian students' thinking abilities at the advanced level are still weak.

The high allocation of study hours apparently does not bring very good results. At junior high school level, mathematics learning outcomes are below other subjects tested in the national exam. Data from the Ministry of Education and Culture's Puspendik (2019) regarding the National Examination results for five consecutive years shows that nationally the average mathematics examination scores at junior high school level are 56.40 (2015), 49.84 (2016) and 50.34 (2017), 46.56 (2018) and 46.56 (2019). This score is the lowest compared to other subjects such as Indonesian, English and Natural Sciences. Most students get grades below average. For Central Java province, mastery of mathematics material such as number operations, algebraic operations, geometric figures, statistics and probability is still in the deficient category (Puspendik, 2019).

Related to cognitive abilities, in the field of psychology there is the discipline Biopsychology which is a scientific discipline that shows a biological approach to the study of psychology. This biopsychological approach is a discipline that creates a bridge between the theory of human cognitive function and the biological function of the human brain. Biopsychology has several main divisions, namely physiological psychology (physiological psychology), psychopharmacology, neuropsychology, psychophysiology, cognitive neuroscience and comparative psychology (Pinel, 2009)

Neuropsychology is the most applied sub-discipline of biopsychology. Some of the themes in neuropsychology are learning and memory, attention and speed of information processing, praxis and motor function, executive function, intelligence, language, visual perception (Jongsma, 2017). Adolescence is a critical period for the maturation of neurobiological processes underlying higher cognitive functions as well as social and emotional behavioral processes.

Currently, researchers in the field of developmental neuroscience are beginning to pay more direct attention to the structural and functional aspects of brain development during early adolescence. Studies in this area have shown significant growth and changes in several regions of the prefrontal cortex throughout adolescence, especially regarding the process of myelination (This process occurs when a substance in the brain called myelin, which consists of lipids and proteins, accumulates around nerve cells, or neuron) and synaptic pruning. Both processes are thought to increase the efficiency of information processing.

These changes are believed to include improvements in various aspects of executive functioning, including long-range planning, meta-cognition, self-evaluation, self-regulation and coordination of affect and cognition. Recent studies also show that adolescence is a time of improvement in abilities related to function in the ventromedial prefrontal cortex, which influences adolescents' ability to consider risks and rewards (Steinberg, 2005).

Regarding executive function, Zelazo et.al. (2016) explains that executive function is an attention regulation skill that allows a person to maintain attention, keep goals and information in mind, refrain from responding immediately, resist distractions, tolerate frustration, consider the consequences of different behavior, reflect past experiences, and planning for the future.

There is also general agreement that executive function is a term to describe the complex cognitive processes that organize goal-directed behavior. In this regard, most definitions of executive function include many things, such as the following elements: goal setting and planning, organizing behavior over time, flexibility, attention and memory systems that guide processes (e.g., working memory) and self-regulatory processes (Zakzanis, et.al. 2005)

Executive function as a cognitive ability consisting of a set of special attention regulation skills involved in problem solving directed at conscious goals is likely to play a role in a person's learning process. It is increasingly recognized that these skills provide an important foundation for learning in the school environment. Research has found that executive function measured in childhood predicts a variety of important outcomes. These results include readiness for school, children's successful transition from home to kindergarten, and also influence their learning achievement in elementary school (such as research results from Fuhs et al (2014), Viterbori et al (2015) and Schmerold et al (2016). Many studies have produced similar results. From this, it can be seen that executive function is related to the mathematics learning process, especially for preschool and elementary school children. However, specifically on adolescent subjects, not much research has been carried out on this theme.

According to the National Association for Gifted Children (2010), a gifted student is someone who has high potential and ability in one or more areas. Some experts emphasize that a gifted student has a higher intellectual capacity ability than his peers in his age and class." According to this definition, gifted students are people who have the potential to show a higher level of progress, compared to their peers. Gifted students are more successful in academics. But there are, some facts exist that some of these gifted students have low achievement, the question arises what happens to some gifted students who are not able to demonstrate their abilities and competencies.

The underachievement of gifted students is a perplexing phenomenon. Too often, for no apparent reason, students who show great academic promise fail to perform at a level commensurate with their previously documented abilities, frustrating both parents and teachers Raghubar, et.al. (2010). The process of defining underachievement, identifying underachieving gifted students, and explaining the reasons for this underachievement continues to stir controversy among practitioners, researchers, and clinicians. Legitimate problems exist in determining whether these students are at greater risk for social or emotional problems than other students, and most interventions to reverse underachievement have met with limited success. Practitioners who responded to a National Research Center on the Gifted and Talented needs assessment identified underachievement as a major research problem (Renzulli, Reid, & Gubbins, 1992).

Sometimes, motivation is low and they are less able to manage themselves in doing tasks. They have high intelligence and talent but show poor academic performance. Underachievement on a task may occur for a variety of reasons (White, Sanbonmatsu, Croyle, Smittipatana, 2002). Although the underachiever is often able to maintain adequate grades during education life because of his intellectual gifts, the signs of the latent underachievement syndrome become increasingly observable over time (Aarnoudse-moens (2012).): Performs well when given one-

to-one attention but is restless and unproductive when required to work independently; they has trouble beginning and completing tasks • Withdraws attention when parents or teachers give instructions; Becomes distractible and distracting when not the center of attention; they has difficulty relating positively to peers (may be revealed in complaints that others are "bothering" the child).

Taghinejad (2020) suggests three important reasons that why some gifted students succeed less than expected: (1) lack of motivation for school-based learning, (2) environments that do not nurture their talents, and (3) neuropsychological problems (learning disorders, attention deficit, memory deficit, and executive dysfunction). The executive function (EF) plays a important role in maintaining and developing academic skills and general school performance; however, few studies directly target EF as a predictor and/or correlation with school readiness.

In recent decades, particular emphasis has been placed on executive functions in psychology and neuroscience (Zelazo et al. 2016); these being understood as superior cognitive functions that control and regulate the most basic cognitive processes (Corso, Sperb, de Jou, & Salles, 2013). The EF model proposed by Miyake (2000), there are three main EF dimensions: update, setshifting, and inhibition. This EF represents an important ingredient for optimal academic functioning and is also one of the most important potential sources of school dysfunction, because EF deficits correlate with learning ability in both mathematics and reading. Diamond (2013) mentions three main factors or cognitive functions: namely, Working Memory, Inhibitory Control (behavioral self-control and cognitive inhibition), and Cognitive Flexibility. Working Memory is responsible for the maintenance and processing of previously acquired information; inhibitory control involves the action of pondering and not acting at a cognitive and/or behavioral level in impulsive manner. Cognitive flexibility is the factor that supports the analysis of multiple perspectives and possible approaches to a problem by adjusting to its own and contextual conditions.

The general objective of this study is to determine whether EF has a correlation with academic performance of gifted student, and The relationship of each component of executive function, namely cognitive flexibility, inhibitory control and working memory with the academic performance of gifted students.

Hypotheses of this study are: a. There is a positive relationship between executive function and academic performance in gifted youth. b. There is a positive relationship between cognitive flexibility and mathematics learning achievement. c. There is a positive relationship between Inhibitory control and academic performance d. There is a positive relationship between working memory (with digit span backward score and digit span sequencing score) and academic performance.

Method

This study uses quantitative research methods, with purposive sampling technique. participants are special class students for gifted students, they have been identified as gifted children by psychologists at the time of selection to enter school Participants A total participants were 82

students from 7 th -the 8 th grades of special class for gifted students of yunior secondary schools in Semarang, 39 girls dan 43 boys, their age about 12-15 years old.

Instruments :

a. Executive Function Executive function is a cognitive skill that is responsible for setting goals, guiding, directing, organizing, and managing goal-oriented cognitive, emotional, and behavioral processes. FE data collection using a neuropsychological test tool, namely the Wisconsin Card Sorting Test (WCST).
b. Cognitive Flexibility The measuring instrument used to measure shifting or cognitive flexibility is the Trail Making Test (TMT) part A & B. Part A, in the form of numbers. Part B contains numbers and letters. Parts A and B both measure the speed of information processing. In addition, section B specifically measures cognitive flexibility.
c. Inhibitory Control Measurement of inhibitory control will use the stroop test. Stroop Color and Word Test (SCWT) This test measures a person's ability to inhibit cognitive processing disorders while processing a stimulus that affects the simultaneous processing of other attributes of the same stimulus.
d. Working memory (Updating) Measurement of working memory ability will use a digit span test. The digit span test that will be used is digit forward, digit backward and digit sequencing.

Statistics Analysis

This study uses a quantitative approach with a correlational. The research variables include executive function (EF) as the independent variable and academic performance as the dependent variable. ▪ For the first hypothesis, to determine the correlation between EF (data obtained from scores obtained by WSCT) and academic performance using Pearson Correlation (product moment). ▪ The second to fourth hypotheses were tested using the Pearson Correlation (product moment) method. The aim is to determine the level of relationship of each variable X from the component of executive function, namely the second hypothesis of this study with academic performance. ▪ The third hypothesis, namely Inhibitory Control with Academic Performance. ▪ The fourth hypothesis is Working Memory (digit span backward & digit span sequencing) with academic performance. The correlation test on the fourth hypothesis will first change the range of digit span backward dan sequencing score becomes a Z score value then the results are averaged. These results will be used in the correlation.

Results

The results showed a significant correlation between executive function and academic performance in gifted children (r=0.104; p 0.05), - The third hypothesis using Pearson correlation analysis. Results of the analysis obtained Pearson correlation value rxy = -0.615 with a significance value of p = 0.000. These results indicate that there is a very significant negative correlation between inhibitory control and academic achievement in gifted students. Based on these results, the third hypothesis proposed is accepted. - The results of the fourth analysis obtained the Pearson correlation value rxy = 0.458 with a significance value of p =

0.001. These results indicate that there is a very significant correlation between working memory (Digit Span Backwards and Sequencing) with academic performance in gifted students.

Discussion

The first hypothesis in this study is that there is a relationship between executive function and learning achievement in junior high school students. Academic performance is "a construct that can have quantitative and qualitative values, and these values provide some evidence and a profile of the skills, knowledge, attitudes and values developed by the student in the teaching-learning process", then brain function is very important to understand how this process takes place. Neuropsychological findings in this area are very useful in explaining this relationship (Reynolds, & Horton (2006). Zelazo and Carlson (2012), educational research should focus on executive function because it is the basis for language development and thus for literacy (the basis for learning) as well as for the processing and organization of received information. explanation of it.

according to Sesma et al. (2009) and Zelazo and Carlson (2012), research on academic performance in education should focus on executive function because it is the basis for language development and thus for literacy (the basis for learning) as well as for processing and organization of received information.

Executive functions but reach as distinct, related, higher-order neurocognitive processes that control thoughts and behavior aimed at achieving a goal or goal (Zelazo and Carlson, 2016). Therefore, they arranged cognitive and emotional behavior and activities through set of adaptive abilities. These functions include working memory (the ability to manipulate information), inhibition (impulse control), cognitive flexibility (ability to come up with different solutions to a problem) and planning (development of a strategy to achieve a goal); that the previous functions are all considered to be the basic process of this variable (Anderson, 2002). The results of this study suggest that gifted students show a superior performance than the group of regular students in the executive functions of Working Memory and Cognitive Flexibility, as well as in the higher functions of Reasoning and Problem Solving. The results of this study show that there is no relationship between CF and EF, while previous studies have shown the opposite. Children with high capacities present better cognitive flexibility in the analysis and processing of information, with an impact on their own learning abilities (Ropovik, 2014; Vaivre-Douret, 2011). It is possible that the curriculum in Indonesia emphasizes memorization, not demanding creativity in learning

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