

The Effect of Government Expenditure on Economic Growth Through the Human Development Index in Indonesia 2016 to 2020 Period

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Abstract — This study aims to examine the effect of the realization of government spending on the education sector, health sector, infrastructure sector on the human development index and economic growth through the human development index in all provinces in Indonesia, as for the research period from 2016 to 2020. In this study using secondary data. in the form of panel data. Panel data is a combination of cross section data and time series data, which consists of data from all provinces in Indonesia from 2016 to 2020. The data sources are obtained from the Central Statistics Agency, the Directorate General of Fiscal Balance, the Ministry of Finance of the Republic of Indonesia, the Ministry of Public Works and Housing. People, Ministry of Health and other sources. The findings of this study indicate that education expenditures have no direct effect on the human development index. Health spending has no direct effect on the human development index. Infrastructure spending has no direct effect on the human development index.

The human development index has no direct effect on economic growth. Education expenditure has no direct effect on economic growth and indirectly through the development index. Health spending has no direct effect on economic growth and indirectly through the human development index. Infrastructure spending has no direct effect on economic growth and indirectly through the human development index. The findings of this study found that, although there was an increase in the amount of expenditure in each province, it was not yet able to increase the human development index due to the disparity in expenditure between provinces, or there were other variables that influenced but were not included in this study.

Keywords— Government Expenditure, Economic Growth and Human Development Index.

I. INTRODUCTION

Economic development is essentially a series of activities that are carried out consciously and continuously to create a better situation together and continuously. Development must be understood as a multidimensional process involving the reorganization

and reorientation of all existing social and economic systems (Todaro & Smith, 2011).

A country can be said to have good economic conditions through the calculation of a high rate of economic growth or simply measured by the increase in the amount of production of goods and services in an economy known as Gross Domestic Product (GDP) and to measure the rate of economic growth GDP is used based on constant prices. (GDP Real) to eliminate the effect of price changes during the measurement time period. (Mankiw, 2006).

Indonesia's economic growth over the last five years has continued to fluctuate even in 2020 nationally it will contract to -2.07%. If we look closely at each province, the highest economic growth in 2019 was Central Sulawesi province with 7.15% and the lowest was West Papua province with 2.66% growth. Meanwhile, there are 14 provinces with an increasing growth rate from 2016 to 2019. Indonesia's economy throughout 2020 accelerated -2.07%. This figure is the lowest since 1998 or during the monetary crisis. At that time, the country's economy grew -13.13%. The bad condition of the Indonesian economy throughout 2020 as a result of the Covid-19 pandemic. The wheels of the economy must be hampered as a result of the policy of restricting people's movement. Indonesia's economy began to decline in the second quarter of 2020 and continued until the fourth quarter of 2020. In the fourth quarter of 2020, the country's economy grew by -2.19%. (BPS, 2021).

In addition to economic growth, human development is a major component in measuring the level of community welfare. Therefore, UNDP (United Nations Development Program) established an indicator called the Human Development Index (HDI) or the Human Development Index (IPM). Since the HDI measurement was implemented, development orientation has not only focused on economic growth, but also on humans as a basic element to achieve sustainable development (Badrudin, 2011).

In the midst of escalating global competition, the demand for the basic capabilities of human development

is felt to be higher, otherwise the nation will be unable to compete with other more advanced nations (BPS, 2008). According to a 2015 report from the United Nations Development Program (UNDP), Indonesia's HDI is in position 110 out of 188 countries with a value of 0.684. Indonesia is below other ASEAN countries, such as Singapore (11), Brunei Darussalam (31), Malaysia (62), and Thailand (93). The pillars used in calculating the index are education, health, and economic growth (Anisa Fahmi, Khairul Amri Dalimunthe, 2018).

The high and low HDI values achieved by each country or region certainly cannot be separated from the role of the government, especially in fiscal policy related to government revenue and expenditure policies. As stated by Wolfson in Suparmoko that fiscal policy is government actions to improve public welfare through government revenue and expenditure policies, resource mobilization and pricing of goods and services (Lilik, 2008). Government spending aimed at certain functions can create an economic multiplier effect through the aggregate demand generated. Therefore, the government's contribution is needed, one of which is through the allocation of government expenditures in the form of spending according to the right function. There is a relationship between government spending and the stages of development, in the early stages of economic development, the percentage of government investment to total investment is very large because at this stage the government must provide infrastructure such as education, health and infrastructure.

In the middle stage of economic development, government spending is still needed to increase growth, but at this stage the role of the private sector is also increasingly needed. In the middle stage, government and private spending are slightly shifting to other sectors such as industry, but this public and private spending does not sideline the public interest. such as health and social services. At advanced levels of economic development, government activities shift from providing infrastructure to spending on social activities such as old-age welfare programs, public health service programs and so on. Rostow and Musgrave in Guritno (1993). Based on some of the arguments above, the researcher is interested in researching the relationship between government spending on the education function, health function and infrastructure function where in the 2020 State Budget (APBN) the three functions are categorized as the focus of central government spending, as well as economic growth and indexes. human development (HDI) in Indonesia for the period 2016 - 2020 as the dependent variable, with the

title "The Influence of Government Spending on Economic Growth Through the Human Development Index in Indonesia for the Period 2016 to 2020".

II. LITERATURE REVIEW

ECONOMIC GROWTH THEORY

A country can be said to have good economic conditions through the calculation of a high rate of economic growth or simply measured by the increase in the amount of production of goods and services in an economy known as Gross Domestic Product (GDP) and to measure the rate of economic growth GDP is used based on constant prices. (GDP Real) to eliminate the effect of price changes during the measurement time period. Economic growth is the average increase in output produced by each person in the production of goods and services which is the real per capita growth rate for each person (Shone R, 1989).

Adam Smith suggested that the human factor as a source of economic growth is to specialize in increasing productivity. Smith and Richardo believe that the limit of economic growth is the availability of land. The classics also believe that economic growth can be achieved due to the formation of capital accumulation that comes from the existence of a surplus in the economy. However, David Ricardo is pessimistic that the availability of capital in the long term will continue to support economic growth (Syam, 2014).

This aspect of human development can be seen from the Human Development Index (HDI). The Human Development Index is an alternative to measuring development in addition to using Gross Domestic Product. The HDI value of a country or region shows how far the country or region has achieved the specified targets, namely life expectancy, basic education for all levels of society (without exception), and levels of expenditure and consumption that have reached a decent standard of living (Sunartomo, W. 2014).

Government Expenditure Keynes version, government spending is one element of aggregate demand. The concept of calculating national income with the approach expenditure that $Y = C + I + G + X - M$. This formula is known as the national income identity. The variable Y represents national income as well as reflects aggregate supply.

While the variables on the righthand side are called aggregate demand. The variable G represents government spending. By comparing the value of G to Y and observing from time to time it can be seen how much government spending contributes in the formation of national income (Dumairy, 1996).

The relationship between education spending and economic growth.

The concept of education as an investment is growing rapidly and it is increasingly believed by every country that the development of the education sector is a key prerequisite for the growth of development in other sectors. Education has been identified as a key factor in economic and social development, and equal access to quality education has become an important goal of development policy. Countries with high levels of educational inequality consistently show lower levels of innovation, low levels of production efficiency, and a tendency to transmit poverty across generations (Winarti, 2014).

Todaro also mentioned that education is a fundamental development goal. Education is the main thing to achieve a satisfying and valuable life, so it is fundamental to shape the wider human capacity which is at the core of the meaning of development. Education has an important role in shaping the ability of a developing country to absorb modern technology and to develop the capacity to create sustainable growth and development (Todaro, 2006).

Relationship between health spending and economic growth

Government spending on the health sector is an effort to fulfill one of the people's basic rights, namely the right to obtain health services in accordance with The 1945 Constitution Article 28 H paragraph (1) and Law Number 23 of 1992 concerning Health. Health priority should be seen as an investment to improve the quality of human resources. (Pake, 2018).

Todaro & Smith (2003), that government spending on the health budget sector that is issued to fulfill one of the basic rights to obtain health services in the form of health facilities and services is a prerequisite for increasing community productivity.

The Relationship Between Infrastructure Spending and Economic Growth

Government spending on infrastructure reduces unemployment and creates new jobs. The increase in public sector spending has expanded which has generated interest in both developed and developing countries optimizing the size of government spending. (Aphu, 2019).

The provision of infrastructure facilities has the dual purpose of generating employment opportunities directly while at the same time using the facilities to encourage productive sectors to generate and provide employment for the population or labor force which will

ultimately have an impact on economic growth. (Araga, 2016).

The Relationship Between HDI and Economic Growth

The higher human development index which includes health, education and purchasing power, the higher the output of goods and services in a country or region. This will increase economic growth. (Ranis, Stewart, and Ramirez 2000) conclude that economic growth will not be sustainable unless it is preceded or accompanied by increased human development, (Andriyani, 2019).

Relationship Between Education Spending and Economic Growth Through HDI

Formal education is believed to be able to develop human resources so that they government in the creation of quality human resources (HR). Government spending can also be said to be an investment in educational facilities, which will certainly make an area more productive, due to the accumulation of knowledge and skills development that can improve the welfare of the community. Investment in education has a very positive meaning to encourage the economic growth of a country. (Todaro, 2003).

Relationship Between Health Spending and Economic Growth Through HDI

Health development is part of national development which aims to increase awareness, willingness and ability to live a healthy life for everyone so that a good degree of public health can be realized. Health development should be seen as an investment to improve the quality of human resources. One factor that affects the degree of good health, namely the level of financing for the health sector, the amount of health spending is positively related to the achievement of public health status and the nation's economic growth. (Sujudi, 2003).

The Relationship Between Infrastructure Spending and Economic Growth Through HDI

Development of facilities and infrastructure in the form of infrastructure can fully improve public services and can increase the flow of goods and services, so as to directly increase human development which can ultimately encourage economic growth and accelerate the pace of development. (Juardi, 2013).

III. METHODOLOGY

In this study the author uses a quantitative approach in which the type of research used is quantitative research that measures and analyzes the effect. The approach used is descriptive, namely to find out and describe the reality of the events being studied or research conducted

on the dependent or independent variables, namely without making comparisons or connecting between variables with other variables. In addition, descriptive research is also limited to efforts to uncover a problem or situation or event as it is so that it is merely to reveal facts and provide an objective picture of the actual state of the object of research.

$$\begin{aligned} \Omega_3 &= \beta_1 + \alpha_3 \beta_4 \\ \mu_{1,2} &= \beta_1 \mu_1 + \mu_2 \end{aligned}$$

Where $\Omega_1, \Omega_2, \Omega_3$ are the parameters to be estimated, while 1,2 is the error term of the Economic Growth variable.

Information:

Y2 = Economic Growth (Percent)

Y1 = Human Development Index (Percent)

X1 = Education Expenditure (Rupiah)

X2 = Health Expenditure (Rupiah)

X3 = Infrastructure Expenditure (Rupiah)

a. Constant:

α_0 = Constant for Y1

β_0 = Constant for Y2

$\Omega_0 = \beta_0 + \beta_0 \alpha_0$ = Constant for Y2

b. Direct Influence:

α_1 = Direct effect of X1 on Y1

α_2 = Direct effect of X2 on Y1

α_3 = Direct effect of X3 on Y1

β_1 = Direct effect of X1 on Y2

β_2 = Direct effect of X2 on Y2

β_3 = Direct effect of X3 on Y2

β_4 = Y1's direct effect on Y2

c. Indirect influence

$\beta_1 \alpha_1$ = Indirect effect of X1 on Y2 through Y1

VI. RESULTS AND DISCUSSION

The collected data is then processed using SPSS 21 Software. After the data is processed, the output generated by the software is as follows:

Table: 5.2.1: Results of Direct Variable Relationship Analysis

HUBUNGAN VARIABEL	KOEFISIEN	SIG.	KETERANGAN
X1 → Y1	-.021	.933	Tidak Signifikan
X2 → Y1	.165	.497	Tidak Signifikan
X3 → Y1	-.134	.574	Tidak Signifikan
X1 → Y2	-.040	.221	Tidak Signifikan
X2 → Y2	-.006	.861	Tidak Signifikan
X3 → Y2	.004	.906	Tidak Signifikan
Y1 → Y2	-.004	.680	Tidak Signifikan

Based on the results of the analysis, Table 5.2.1 shows the results of statistical analysis of the direct influence of education spending on the human development index, the effect of health spending on the human development index, the effect of infrastructure spending on the human development index, the effect of education spending on economic growth, the effect of health spending on economic growth. The effect of infrastructure spending on economic growth and the influence of the human development index on the economic growth of all provinces in Indonesia in 2016 to 2020.

The estimation result of education expenditure on the human development index is -0.021 with a significance level of 0.933. This means that education expenditure has no positive and insignificant effect on the human development index. The results of the estimated health expenditure on the human development index are 0.165 with a significance level of 0.497. This means that health expenditures have no positive and insignificant effect on the development index human. The estimation result of infrastructure expenditure on the human development index is -0.134 with a significance level of 0.574. This

means that infrastructure expenditure has no positive and insignificant effect on the human development index. The estimation result of education expenditure on economic growth is -0.040 with a significance level of 0.221. This means that education expenditure has no positive and insignificant effect on economic growth. The estimation result of health expenditure on economic growth is -0.006 with a significance level of 0.861. This means that education expenditure has no positive and insignificant effect on economic growth. The estimation result of infrastructure expenditure on economic growth is 0.004 with a significance level of 0.906. This means that infrastructure expenditure has no positive and insignificant effect on economic growth. The estimation result of the human development index on economic growth is -0.004 with a significance level of 0.680. This means that the human development index has no positive and insignificant effect on economic growth.

Effect of Education Expenditure on Human Development Index.

The results of the estimated education expenditure on the human development index are -0.021 with a

significance level of 0.933. This means that education expenditure has no positive and insignificant effect on the human development index in all provinces of Indonesia during the study period, 2016 to 2020. This is due to the large value of expenditure. education is not evenly distributed in each province. These results are in line with research conducted by Sigit Wibowo in 2016 which stated that the realization of government spending on the education sector had no effect on the human development index in the province of Central Java. The results of this study are also supported by research conducted by Iqbal in 2021 which states that education spending has a negative effect on the human development index in Gowa Regency.

Effect of Health Expenditure on Human Development Index.

The results of the estimated education expenditure on the human development index are 0.165 with a significance level of 0.497. This means that health expenditures have no positive and insignificant effect on the human development index in all provinces of Indonesia during the study period, namely 2016 to 2020. The occurrence of disparities in realization between provinces makes spending health has no effect on the human development index. The results of this study are in line with research conducted by Suparmi, Nunik Kusumawardani, Devaki Nambiar, Trihono & Ahmad Reza Hosseinpoor in 2018 which found that provinces in eastern Indonesia had low PHDI and very high inequality within the province. Research conducted by Windhu Putra in 2017 also strengthens the results of this study where the variable of government expenditure in the health sector has no significant effect on the human development index during the period from 2007-2014.

Effect of Infrastructure Expenditure on Human Development Index

The estimation result of infrastructure expenditure on the human development index is -0.134 with a significance level of 0.574. This means that infrastructure expenditure has no positive and insignificant effect on the human development index. This is due to the disparity in the realization of government spending on infrastructure between provinces in Indonesia. This result is in line with research conducted by Ginanjar Aji Nugroho in 2016, which classified provinces in Indonesia into two, the first being provinces with a high development index while the second group was provinces with a moderate human development index. The results show that in the first group, government spending on infrastructure is able to influence the human development index, while in provinces with a moderate development index,

infrastructure spending has no effect. Research conducted by Sumyati (2008), shows the results that there is no influence between government spending on the infrastructure sector on the human development index.

The Effect of Education Expenditure on Economic Growth

The estimation result of education expenditure on economic growth is -0.040 with a significance level of 0.221. This means that education expenditure has no positive and insignificant effect on economic growth. This is due to the large amount of education expenditure that has not been evenly distributed in each province. Government spending on education that will result in improvements in the education sector cannot quickly change the quality of human resources which in turn increases work productivity. Research conducted by Josaphat P Kweka and Oliver Morrisey (1999) in Luki Alfirman (2006) in Tanzania The results obtained that government spending has a negative impact on economic growth, the negative impact is due to the inefficient government spending in Tanzania.

Effect of Health Expenditure on Economic Growth

The estimation result of health expenditure on economic growth is -0.006 with a significance level of 0.861. This means that education expenditure has no positive and insignificant effect on economic growth. The occurrence of disparities in realization between provinces makes health expenditures have no effect on economic growth.

The results of this study are in line with research conducted by Jurais (2021) which states that the realization of health spending in South Sulawesi province has no effect on economic growth due to the uneven amount of expenditure budget in all districts/cities and tends to focus on only a few areas.

In line with research conducted by Yola (2015) examining the effect of government spending on health and infrastructure on labor absorption, it shows that the effect of government spending on health functions is not significant on economic growth and employment in West Java Province. In addition, the government needs to control the utilization of local government expenditures so that optimal results can be obtained in increasing economic growth.

The Effect of Infrastructure Spending on Economic Growth

The estimation result of infrastructure expenditure on economic growth is 0.004 with a significance level of 0.906. This means that infrastructure expenditure has a

positive and insignificant effect on economic growth. This is due to the disparity in the realization of government spending on infrastructure between provinces in Indonesia. The results of this study are in line with research conducted by Heri Suparno (2014) which states that government spending in the infrastructure sector has a negative and insignificant effect on economic growth. significantly in economic growth.

Government spending in the infrastructure sector has a long term so that it will only be felt for economic growth in the long term. Royhan Faradis and Uswatun Nurul Afifah (2019) in their research results that, the provinces on the islands of Java and Bali have adequate infrastructure, the provinces on the island of Sumatra have a fairly adequate category, the provinces on the island of Kalimantan are inadequate except for South Kalimantan, while those included in the infrastructure category inadequately distributed in eastern Indonesia, namely Maluku and Papua islands and some provinces on Sulawesi Island.

Effect of Human Development Index on Economic Growth.

The estimation result of the human development index on economic growth is -0.004 with a significance level of 0.680. This means that the human development index has no positive and insignificant effect on economic growth. Economic growth has a dual causation with human development but in several studies it was found that there are other variables that influence and strengthen so that dual causation can occur as stated by Ranis (2000) that, reinforcing variables between human development include economic structure, asset distribution, social capital, high investment, equitable income, and the right economic policies. The results of this study are in line with research conducted by Moh Muqorrobin (2017) which states that the human development index has a negative influence on economic growth in East Java Province. The results of this study are also supported by research conducted by Farathika Putri Utami in 2020, where the results of the study show that the human development index has a negative effect on economic growth in Aceh Province. capital.

Result of Estimating Coefficient of Direct and Indirect Effect Between Variables.

RELATIONSHIP VARIABLES	Direct	Indirect	Relationship Coefficient Indirect	Description
X1 → Y2	-.040	$\beta 1 . \alpha 1$	0.222	Not Significant
X2 → Y2	-.006	$\beta 1 . \alpha 2$	0.878	Not Significant
X3 → Y2	.004	$\beta 1 . \alpha 3$	0.920	Not Significant

Description

* Significant at = 0.05%

Indirect Effect of Education Expenditure on Economic Growth Through the Human Development Index

The results of the estimation of education expenditure indirectly on economic growth through the human development index with a significant level of 0.222. This is because the value of education expenditure is not evenly distributed in each province. Inequality in education spending will have an impact on inequality in economic growth through the Human Development Index, because one of the three indicators of the human development index is the education variable. In addition to the disparity in the realization of education expenditures between provinces, the proportion of education expenditures is also greater for personnel expenditures where personnel expenditures are. The results of this study are in line with research conducted by Susye Marlen Ketsy Lengkong (2017) which states that education spending does not exist for its effect on

economic growth in the short term. Indeed, the education budget allocation should be a form of long-term investment in growing competitiveness in the future.

Indirect Effect of Health Expenditure on Economic Growth Through the Human Development Index.

The results of the estimated health expenditure indirectly on economic growth through the human development index with a significant level of 0.878. In addition to the disparity in the realization of health expenditures between provinces, the proportion of health expenditures is also greater for personnel expenditures where personnel expenditures are. The results of this study are in line with research by Fajar Ladung in 2018 which found that the regression results showed that government spending in the health sector did not have a positive effect on economic growth, considering the large influence of government spending on improving the performance of health, it is necessary to make gradual efforts from the government. to continue to increase its spending on the health sector.

Indirect Effect of Infrastructure Expenditure on Economic Growth Through the Human Development Index.

The results of the estimation of infrastructure spending indirectly on economic growth through the human development index with a significant level of 0.920. This is due to the disparity in the realization of government spending on infrastructure between provinces in Indonesia. Inequality in budgeting is clearly seen from infrastructure development between provinces, such as data from the Ministry of PUPR in 2021 which shows the province with the largest percentage of steady roads is the Province of the Bangka Belitung Islands, which is 99.84%. Meanwhile, the province with the lowest percentage of steady conditions is West Papua Province, which is 73.10%. Studies show that if you want to prosper the people and increase economic growth, what you have to do is improve distribution channels. This research is in line with research conducted by Rouhan Faradis and Uswatun Nurul Afifah (2020) which states that infrastructure development is absolutely necessary to increase Indonesia's economic growth that carries the principles of pro-poor, pro-growth, and pro-job. However, the condition of each region is different so that this goal is always accompanied by inequality in development outcomes.

V. CONCLUSIONS AND SUGGESTIONS

Based on the data that has been processed and analyzed, it can be concluded: 1. Education expenditure has no effect on the human development index 2. Health expenditure has no effect on the human development index 3. Infrastructure expenditure has no effect on the human development index 4. Human development index has no effect on growth economy. 5. Education spending does not affect economic growth through the human development index 7. Health spending does not affect economic growth through the human development index 8. Infrastructure spending does not affect economic growth through the human development index.

Suggestion

From the results of the research and discussion, it is suggested that the Government as a determinant of fiscal policy needs to consider the distribution of government spending in each province in Indonesia. Based on previous data, government spending is still not evenly distributed between provinces.

Future researchers are expected to use a longer period of time and use more specific variables. For example, in government spending, it is necessary to be more specific

on the distribution of government spending itself, namely examining direct or indirect spending on the human development index and economic growth.

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Tracing Issues and Concerns on Technological Pedagogical Content Knowledge (TPCK) in Math and Science

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Abstract — In lieu to the final examination of the Ph.D. students of the University of the Philippines Open University (UPOU) under EDSC 305 Seminar: Issues and Trends in Science, Mathematics, and Technology Education course thereby required to outline a concept note served as prerequisite mainly to address current issues in science, mathematics, and technology education. Thus, it also expected that the concept note presented should be novelty, thorough, analytical, and evidence based. Wherein, it showcases the rational of the specified program, possible policy implications and will be organized based to the following structure: Cover Page; the Proponents; the Potential Key Partners; Rationale; Program/Research Overview; and References. This paper explores the concept of self-evaluation in education to uncover concerns, issues and difficulties, which mainly, that enabling individual schools and teachers to self-evaluate effectively their tasks as a complex task that will require help and support from the community of professional evaluators as cited by McNamara & O'Hara, 2008.

Keywords— Concept Note; Philosophy of Education; Science and Math Issues; TPCK.

I. INTRODUCTION

This article adheres to accept the challenged that raised by the Faculty in charge (FIC) of the course EDSC 305 Seminar: Issues and Trends in Science and Mathematics, and Technology Education answering those issues and concerns relative to teacher education particularly in mentoring and supervision. Using content review analysis (Kondracki, Wellman & Amundson, 2002), it was then understood that the effective teaching is not solely the responsibility of teachers, but instructional leaders like school heads and supervisors plays equally important roles in ensuring pedagogy of science and mathematics. As it was also emphasized that supervising science and mathematics instruction entails, among others, communicating high expectations for teachers, monitoring assessment, tracking, progress of

students, coordinating curricular work, and supporting and mentoring teachers. Thus, certainties thru studies hereby employs to attain or acquire data that supplement to:

1. explain the roles of instructional leaders;
2. define quality supervision;
3. identify key issue in supervising science and mathematics teaching; and
4. differentiate supervision from mentoring.

Provided Dr. Monalisa T. Sasing, the FIC of the EDSC 305 course has directed his students in the University of the Philippines, Open University (UPOU) who took Philosophy in Education to draw a concept note (see appendix 1). Thus, basically students who took ESDC 305 course during the Second Semester, AY 2020-2021, of the UPOU were advised to read issues on teacher mentoring and supervision, and quality of supervision which mainly relative to science and mathematics.

Theoretical and Conceptual Framework

Eby, Rhodes & Allen (2007) integrated values on understanding and improving how schools provide instruction, thus they cited McPartland (1985) on his article titled “The Myth of the Mentor” emphasizing that mentor should have acted as a coach, extending teaching, feedback, strategies in preparing his trainees to be more confident and certain for such exposure or visibility. Looking onward to this progressive objective, and it is more advantageous if McNamara & O'Hara, (2008) concept on the self-evaluation of the educational policy should be adhere in order to evaluate the regulation of public services, and the servants in education. And also to extend evaluation and inspection of the import elements, issues and trends in science, mathematics, and technology education. Further, in order to draw a conclusive concept and to acquire precise, evidence based results Punya Mishra and Matthew J. Koehler's 2006 TPACK framework (see Figure 1) and the Persuasion Map Template (see Figure.

2) cited from 19 Types of Graphic Organizers for Effective Teaching and Learning (n.d.).

II. METHODOLOGY

This study employing Explanatory sequential mixed method design (Subedi, 2016) in order to explore reality based on the actual scenario or perspective of the target beneficiaries/respondents that would redound to acquired data which contemplates to: explain the roles of instructional leaders; define quality supervision; identify key issue in supervising science and mathematics teaching; and differentiate supervision from mentoring. With this purpose, it is obviously supported a concept note that would serve as an instrument or materials to gather data, see on Appendix 1. And Using content review analysis (Kondracki, Wellman & Amundson, 2002) as the authors' basis in arriving conclusion.

III. RESULTS AND DISCUSSION

Eventually, a concept note was drawn to comply the challenged of Dr. Monalisa T. Sassing, the Faculty In-charge of the EDSC 305 course of the University of the Philippines as illustrated below in detailed was the actual results as to evidence based concept, as prescribed

this concept note was done within the specified number of pages, double-spaces with arial style and with a font size of 12, properly imposed a plagiarism checked (see in Appendix. 1).

Precisely, the concept note was made evidently based on the following structured: the Cover Page that contains the title of the concept note, the names of the group members, and the submission's date which are aligned at the center; the Proponents, wherein it describes the profile of group members; the Potential Key Partners, this section lists the potential partner agencies and described their profiles; the Rationale, it briefly provide gaps/issues being address and discussed the main points based on the related literature, it also presents the significance of such program or research work; the Program/Research Overview, showcase the objectives, expected outcomes and outputs which were related to the objectives, described the program/research, determined the major activities, and identified the key target beneficiaries including their characteristics/demographics and rationale; and then, listed all the References with the application of APA style (7th edition).

Appendix 1. CONCEPT NOTE

The Cover Page

Tracing issues and concerns on Technological Pedagogical Content Knowledge (TPCK) in Math and Science

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The Proponents

EDILMAR P. MASUHAY

Author Biography



Edilmar Patagan Masuhay, was born in Mainit, Surigao del Norte, Philippines on August 31, 1972. Presently studied Philosophy of Education (Ph.D.) major Mathematics Education at University of the Philippine, Open University (UPOU), Los Baños, Laguna under SIKAP Grant Scholarship Program. Completed MS Mathematics Education under the CHED Kto12 Scholarship Grant, and Chosen as one of the CHED Success Story. From December 1997 to the present he is at service teaching math subjects in Surigao State College of Technology. He published his Thesis titled "Uncovering Transformative Experiences among Students with Shortcomings in Statistics" in the International Journal of Current Research (IJCR). Authored of

five (5) unpublished books utilized by BAT and BSAF students of SSCT, the books titled are: Pre-calculus: a logic and geometric means; Mathematics in the Modern Word (Module Design); The historic and political system of the Philippines; The memoirs of Dr. Jose Rizal and his impact to the life of Filipinos, RA 1425; and The Philippine Government, Principles and Policies. Edited and published more than 30 research articles both sole and co-authored. Awardee as Journal Reviewer in International Journal of Advanced and Applied Sciences (IJAAS), an Institute for Scientific Information (ISI) Indexed. Published five (5) students' co-authored manuscripts as part of their Knowledge Skills and Attitudes (KSA) earned from their subject Mathematics in the Modern World (MMW) on their First Year, First Semester, CY 2019-20. Edited and assisted publication of more than ten (10) scholarly non-authored articles. Received GOOGLE SCHOLAR CITATIONS: Cited by three (5) Researchers from Qatar, Bangladesh, Singapore and Philippines on his article titled "Adversities on Covid-19 Set Forth an Argument Onward to Educational Endeavor Resulting to Develop a Modular Concept in the Learning Process". He was an affiliated member of the following professional researchers' organizations: NRCP; NOPTI; PNEE; PACSA; PARSSU; PASCHR; PARESSU; ERAAR and CARAGA LIBRARIANS AND LIBRARIES ASSOCIATION (CLLA), Inc.; and elected Faculty President of the SSCT-Mainit

Campus. Moreover, he previously experienced to work as: Ex-Officio Member; Salesman; SGV Internal Auditor; Liturgical Ministry Member (Roman Catholic); Loan and Credit Investigator Officer under AUSAID Program; Vice-Dean to Administration and College Overseer; Assessor and Trainer in Training Methodology and Assessment; and Program Manager and Services Coordinator; Security Officer In-charge; ROTC Coordinator; and Business Affairs Office Secretary; Supreme Students' Council Adviser; Librarian Designate; and Faculty President-SSCT Mainit Campus.

MARINEL E. DIOQUINO

Author Biography



Marinel Elquero Dioquino, from the place of beauty, serene yet powerful this is the home province of Sorsogon, born on April 23, 1988. Presently studied Philosophy of Education (Ph.D.) major Biology at University of the Philippine, Open University (UPOU), Los Baños, Laguna. She was a graduate a Bachelor of Science in Nursing, and after a year took up a methods of teaching in Sorsogon State University. Luckily by hard work, determination and optimistic she passed both the licensure examination for Nursing and Teacher. She also graduated her Master's degree on Science, major in Science Education in the same School. She is 9 years in teaching field but newly hired in government

schools. Her first year in teaching was on Aemilianum College Inc. where she teaches science. After a year she transferred in an all school boys the Our Lady of Peñafrancia Seminary where for 8 years she teaches science from junior and senior high school. Currently, she is a public secondary teacher in Sawanga National High School and a writer for Learners Activity Sheet for SHS for the upcoming school year 2021-2022. She is still learning and determined to learn.

ANNIE RICHIL M. CAGAS

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Annie Richil M. Cagas is a Secondary School Teacher II of Bacuag National Agro-Industrial School, Bacuag, Surigao del Norte. Graduated her college degree in Bachelor of Science in Agricultural Education major in Animal Husbandry at Surigao del Norte College of Agriculture and Technology. Fortunately, she was able to avail the Certificate Program Teaching in Mathematics, a scholarship program of Department of Science and Technology for non-major teachers teaching Science and Mathematics way back 2006-2007. Presently, she is enrolled in Master of Arts in Educational Management at University of Southern Philippines Foundation at Cebu City.

MARIDEL M. MAHOMOC

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Maridel Masuhay Mahomoc is a Senior High School Teacher II of Bacuag National Agro-Industrial School, Bacuag, Surigao del Norte. She graduated her college degree as Bachelor of Science in Agricultural Education major in Animal Husbandry at Surigao del Norte College of Agriculture & Technology. Presently, she is enrolled at Surigao State College of Technology in her master's degree as Master in Industrial Education major in Industrial Arts. Currently, she is one of the SLM writer of Surigao del Norte division for the TVL-AFA (Swine) NC II, TVE-AFA (Ruminant), and ESP 9.

SUGAR O. MASUHAY

Author Biography



Sugar Olitres Masuhay is an Elementary School Teacher III of San Francisco Elementary School, San Francisco, Mainit, Surigao del Norte. Graduated her college degree in Bachelor of Elementary Education major in Science and Health at Saint Paul University Surigao, Surigao City. She took up her Master's Degree (MAED) at Agusan Colleges Inc., Butuan City earning 36 units with CAR way back 2018.

The Potential Key Partners

The proponents' delivering institution should be considered directly as a potential partner. The Delivering Higher Education Institution (DHEI) e.g. CHED, DepEd, and TESDA, shall:

1. Implement the work plan as stated in the project proposal;
2. Coordinate with the various stakeholders in implementing the activities/procedures stated in the proposal; and

3. Spearhead the management of the project, particularly the early stage of implementation;
4. Monitor the day-to-day implementation of the project;
5. Do presentation and keeping records such inventory and sales; and
6. Publish project data and accomplishment.

Constituents: [(Public or Private); (Organization or Individual); (Professional or Non-professional)]

1. Admit or enroll to be part and beneficiaries of the program.

The Rationale

As prerequisite for Ph.D. Students of UPOU under the Supervision of Dr. Monalisa T. Sasing, FIC in EDSC 305 course. This Concept Note has been put into reality, and eventually this intention allows the proponents to read previous literatures about the Critical role of supervision and the Quality of supervision more probably related to Supervision of Science and Mathematics.

The reading activities serves as bases to answers the following questions:

1. What are key issues in instructional supervision?
2. What are other issues in instructional supervision?
3. What are the possible ways to address those issues?

Philippine Education: issues & concerns in school administration & supervision is a replica strata of the system, this thought has been shared in the discussion forum on issues in supervision. Evidently, based on literature other issues in Instructional Supervision were raised as enumerated under Trends, issues & concerns in school administration & supervision (n.d.), and among those issues, two issues have been emphasized by Ocampo, Lucasan & University of the Philippines (Eds.) (2019); and by Mehta (2004) as it was explained by them. Wherein, solutions were proposed to address those issues, and they provide a sufficient explanation as to how the proposed solutions can address the issues that were cited.

Among those issues and concerns in School Administration & Supervision, due to the prevailing tendency or inclination Trend expansion of educational opportunities and service Trends in school administration & supervision, findings showcase the following datas:

DepEd Budget

The government assistance to Students and Teachers in Private Education Act (GASTPE) as amended by Republic Act (RA) NO. 8545 (19998), has provided for the implementation of mechanisms that contribute to making quality education accessible to all Filipinos. GASTPE eventually extended assistance to Students and Teachers in privates' education, educational service contracting (ESC) program, teachers' salary subsidy (TSS), and Senior High School Voucher Program (SHS VP) thus, the private education assistance committee co-implements with the DepEd.

And while private schools claim their share for this intentions to cover the cost for quality education findings based on data were found not sufficient thus, the cost or value is less than what we're expected to defray the exactness of the vouchers vales. These scenarios are only among the real scenarios that the country was facing, with many challenges in implementing a national scale education programs such as ESC, TSS, and SHS VP, there are many opportunities for research in order to inform policies, to refine or modify process and practices, and to improve the effectiveness of the programs, which will contribute to realizing the broad goals of education in our country.

Enrolment and the number of teachers.

The expansion of educational services, turns such expansion as the enrolment in all levels increases, such that the educational services were also increasing in parallel in terms of money, materials, and manpower. And with the increase in the educational services, we may expect that the best of our administrators and supervisors will be put to a severe test. These issues of enrolment and no. of teachers can be possibly addressed easily once projection of population, enrolment and teachers were analyzed (Mehta, 2004).

Moreover, this course also permits the students to learn relative topics on mentoring teachers such that students were preferred to look or search a credible article about mentoring teachers, and for them to share their thoughts and ideas in forum on how mentoring differentiated from supervision.

The Program/Research Overview

Objective

This project aims to contemplate the Teacher Education Concern and Issues such that it is expected that students in this course should explain the roles of instructional leaders, define quality supervision, identify key issues in supervising science and mathematics teaching, and differentiated supervision from mentoring. Mainly, it is