Management Information Systems for Decision Making in Vocational High School

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Abstract*— One of the strategies for achieving the educational objectives established in schools through use of technology and information. The data which inputted in the program should be valid data as an initial source of decision making in the vocational high schools according to management information systems. The aim of this paper is to figure out how to use a management information systems program in a vocational high schools and how it affects to decision making in vocational high schools. This research used a qualitative method and the findings show steps of used application management information systems are data input, data validation, data display and data translation. Management information systems has big affect of decision making, identifying problems, determining problem criteria, looking for alternative solutions to problems based on the level of importance determining decisions that are in accordance with culture and goals are the stages of decision making using management information systems.
Keywords*— Management Information System; Decision Making,

INTRODUCTION

In today's era, decision making in a company made by managers is always related to the uncertainty of the results of decisions taken. To reduce the uncertainty factor, the decision requires accurate information about the conditions that have been, and may occur, then process the information into several alternative problem solving as a considerationin deciding the steps to be implemented, so that the decision taken is expected to providemaximum benefits. (Ramadina,2017)

The importance of education is recognizedaround the world. All developed countries have higher education levels compared to developing and developing countries. Differences in the economy, standard of living,medical care, and all other areas may be related to education. Education makes it possible to understand problems, think about others, and gain a better understanding ofsocial responsibility, integrity, harmlessness, and not using the wrong means. It creates healthy competition among individuals, groups, departments, organizations, and countries. Prosperity and poverty, technological progress, military power, trade and economy are all related to education level. Education helps develop skills and helps foster self-confidence and mutual respect. Education contributes to personality formation and nation. Countries around the world recognize the importance of education and prioritize education programs. Theconstitutions of many countries establisheducation as a fundamental right of citizens. Federal, state, local, commercial, and non-governmental organizations are looking at thisimportant sector Technology and informationas a database of data collection have a very important role in supporting the creation of educational goals. Therefore, educational institutions must have a good, precise andaccurate data collection system to provide good quality services and as a basis for decision making. The Ministry of Education and Culture responsible for the implementation of education in its data collection has used an educational management information system known asDAPODIK (Basic Education Data). Dapodik used in the Ministry of Education containsinformation needed in the decision making ofthe field of education. This system recordsabout the number of institutions, educators and education personnel, facilities owned, and others. The presence of the DAPODIK system is expected to be more accurate and continuously updated so that it can be used asa basis for decision making. Ideally decision making requires a valid data source and is easyto read. Valid and easy-to-read data is required as a consideration used in any time- limited policy making or decision-making. Therefore the role of data in decision making is very important. If a decision is formulated bythe Principal without being based on data then it can be ascertained that the decision will not be able to become a problem solver but instead become a new problem.

Madiha Shah (2013) the study have been designed in recent years to gather information on the extent to which schools are developing the capacity to integrate

ICT into learning, teaching, and management processes. A steady increase in the number of computers and other technologies over time has been evident in the literature, with most schools achieving the baseline targets for computer-to-pupil ratios. School management information systems have greatly improved over the last two decades and most of them incorporate several important functions required by school administration; however, every school has its own specific needs. Further studies are needed to explore the areas of improvement in MIS as most of these systems are not developed according to the site-based needs. These systems are usually adopted from outside and may need further enhancement according to the site-based management.

Bright (2019) The title of the research is The Impact Of Management Information System On University Of Education Winneba, Kumasi Campusghana. From the study show that MIS has improved teaching and learning and it has also enhanced or modify the learning process. It was also clear that UEW K is inadequately equipped for MIS operations (especially electronic equipment). The available MIS equipment was not sufficient to be utilized by students, lecturers and senior administrative staff within the university campus. To enhance administrative decision processes, so that decision making, policy analysis, formulating, planning, monitoring and management at all levels can be a reality effective MIS operation should be adequately available. Although some challenges were encountered this served as an obstacles in effective utilization of MIS within the campus.

LITERATURE REVIEW

a. System

System etymologically comes from the word systema which means therelationship between parts or componentswith each other on a regular and thorough basis. While the terminology states that a system is a collection of parts that relate toone another.

Helmawati revealed that the system is everything that is interrelated including data and certain parts that are managed soit can be referred to as a system. With this understanding, education can be incorporated into a system. When in aneducation there is management of an information system it can be said as a subsystem. This is a usefulness that is owned by management informationsystems for those who manage education. A system has a goal in the scope of education is to achieve the educational goals that have been planned.

The system in education is in the form of processing data from inside and outside the educational environment that produces information important for the sustainability of existing systems, in other words there is an open system where thereare inputs managed into output.

James A. O'Brien (2007) defines a system asa device consisting of components that are related, with a boundary, working togetherto achieve a common unity objectively by accepting inputs and generating outputs inan organizational transformation process.

b. Information

According to David and Olson, informationis data that is processed into a form that ismeaningful to the recipient and has value as decision making. Information can also besaid to be a data that serves as a basis in decision making. Information today is managed using technology.

Alabi (1999) stressed that information has to do with knowledge acquired and result when data are organized or analyzed in some meaningful ways or convenient form understood by the recipient for easy job performance and decision-making.

c. Management

Robbins expresses management as the process of obtaining something work effectively and efficiently through cooperation with others.

Efficient means doing the work correctly which shows the relationship betweeninput and output with the use of the source

of the smallest cost. While effective meansdoing a job correctly that leads to the achievement of goals.

According to Rue (2003) management is the process of deciding how to use business resources consisting of workers, equipment, and money to produce good service. Management is a framework that includes coordinating an organization's resources.

d. Management Information Systems

Management information systems are a combination of information systems and management, information systems and management synergize in the process of planning, implementation to

decision making. Amirin provides the understanding that a management information system is a set of people, a set of guidelines, and data processing equipment (a set of elements) choosing, storing, processing, and calling back.

Waston et al. (1987) describes management information system (MIS) as 'an organizational method of providing past, present and projected information related to internal operations and external intelligence. It supports the planning, control and operation functions of an organization by furnishing uniform information in the proper time frame to assist the decision makers'. Telem (1999) defines MIS as 'a management information system designed to match the structure, management task, instructional processes, and special needs of the school'. O'Brien (1999) referred MIS as 'a term given to the discipline focused on the integration of computer systems with the aims and objectives of an organization'.

Management information systems can reduce uncertainty in decision making. Management Information Systems provides information to the leadership at the time of making a decision.

. According to (Jogiyanto:2005) management information systems are the application of information systems in organizations to support information needed by all levels of management.

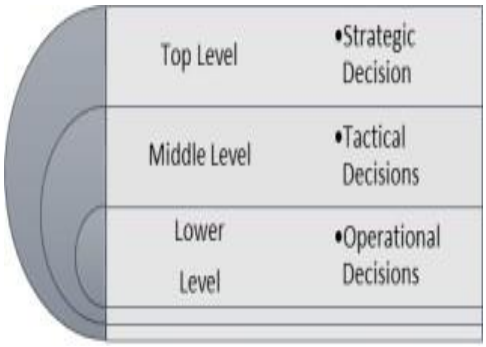

Figure 1 : Decision areas and management levels

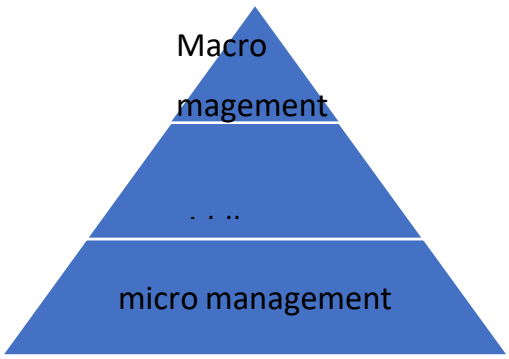

Figure 2: Management Level (Jogiyanto: 2005)

1) Top level management consists of: President, Director (vice manager) and other executives. (Jogiyanto 2005: 16) 2) Middlelevel management consists of: managers and managers. (Jogiyanto, 2005:16) 3) Lower level management is called operatingmanagement including foreman and staffer. (Jogiyanto 2005:16)

The components of the Management System according to Judith C. Simon are human, procedures, hardware, software and data.

Humans are defined as the drivers of components in the system such ashardware, software, procedures and so on.The procedure is used as a guide to the useof information systems used in school environments.

Hardware is a physical device in the form of a computer or laptop. With this digital era,the ability or capacity of the computer has changed for the better.

Software is the term for a program owned in a hardware. Data is a term used for a particular fact. This data can be changed as documents or records that underlie decision making.

Trends in MIS Technology has contributed to MIS in big way. Introduction of computers, other hardware and software have added to the value of information system. Internet, intranet and extranet have increased the pace of life by quick transfer of data and information across the globe. These aspects are deliberated here. 5.1 Computer acts as a repository of all the data. Processing of data for business decisions and transactions was never fast and easy as is today. This is possible with the introduction of computers and various software which helps in doing the work very fast and accurately. The speed of the work is accelerated to with the programming and dedicated software for particular activities. Facilities of copy, cut, paste, scan, print, edit, translation and checking of plagiarism have added value to the information system and print has changed the transfer of information very fast thus reducing the activity‟s time. Computers have enabled very fast calculations which otherwise would take many times the time. The quality of work and accuracy produced by the computers has enhanced confidence level in the users in the information system by technological support and done correctly. 5.2 Power of internet The technological developments have changed the way of working of the organizations. Computers has revolutionized the management of the information. Internet has made the information transfer very fast. Today files, pictures, videos can be sent instantly. Sending the information from one place to another place used to take 10-20 days. It can now be delivered instantly without any other person involved in between. Skype, g-talk and many

other messenger services has enabled face to face talk very clearly. There is no need to travel physically for discussion or meeting someone. Most of the things can be done on internet. Online sale, purchase, auction, group discussions, webinars, virtual meetings have empowered everyone in the business. Examples of works done easily through internet include payments for electricity bills, telephone bills, booking of tickets for journey by air or rail, making payments online for admission in a university abroad, getting latest information on the available course for admission, applying for admission on line. Education reaches to a very large number of persons through online lessons. Online lessons has enabled everyone to get educated sitting in the house or in the office. Network has connected every one. Google search and other search engines make available large amount of data on the net to help people to find things from anywhere in the world. One is able to send messages faster and correctly. Internet can communicate with other computers or telephones. Companies and individuals can use internet to exchange business transactions, text messages, graphic images, and even video and sound. 5.3 The Intranet Units located at different locations and various departments like marketing, production, materials management, maintenance, finance and human resources are linked to each other through Intranet. Each department can have access to the information required by it online without waiting for the support of other department. The intranet has enabled an integrated management system with the common information system of the organization. This is an internal communication system and sharing of data and information within the organization. Intranet has made the organizations more strong and have become more flexible to easily adjust to changing needs of the customers.

Management Information System (SIM) is an information network that is needed by the leadership in carrying out its duties (for the benefit of the organization), especially in making decisions in achieving theirorganizational goals. SIM techniques to provide managers with information that allows them to plan and control operations.Computers have added one or two dimensions, such as speed, accuracy and increased volume of data, allowing for more consideration of alternatives to a decision, which in an organization consists of a number of elements, people who havevarious roles in the organization, activities or tasks to be completed, workplaces, job authorities, and communication relationships that are bind with the organization. Sim is the application of information systems in the organization to support the information needed by all levels of management. Sim pressure is on the system, not on its management, but in order for the SIM to take place effectively and efficiently, it needs to be managed as well as possible.

Visscher (1996b) believes that MIS can provide administrators and teachers with the information required for informed planning, policy-making, and evaluation. Gurr (2000) claimed that MIS have changed school management in the areas of leadership, decision making, workload, human resource management, communication, responsibility, and planning. These systems can assist the school manager in determining the aims of the school, formulating strategic plans, distributing resources, and evaluating staff performance as well as organizational success (Telem & Buvitski, 1995; Telem, 1999). Bober (2001) indicates that the growing interest in MIS's and the trend toward thoughtful, long-range planning for MIS implementation stem from the belief within the school community that such systems allow for better site and district management, empower staff at all levels, and increase a school or district's accountability to the community it serves. Efficient and quick decisions could be made possible when school managers get accurate and up-to-date information by MIS (Christopher, 2003).

The types of management information systems according to Davis are divided into two: closed management systems where there can be no exchange of material and information. Open management information system is where information inthe system can be exchanged or sharedwith each other. These open management information systems tend to be adaptive to an ever-changing environment.Organizational structure basically can bedivided in three layers of hierarchy: top management level, middle management level and lower management level (Fig. 2). Each level takes decisions according to their roles.

Junior executives are involved in operational decisions, middle executives focus on tactical decisions, and top executives focus on strategic decisions. Most of the day-to-day activities, such as planning, planning, and ensuring that all plans are implemented as determined, areplanned, executed, and managed by the submanager. Mid-level managers spend relatively little time planning activities on adaily basis and focus more on tactical decisions such as problem solving, gap

analysis, performance evaluation, and advertising. The roles of top managers are very different from those of lowermanagers and middle managers.

They mainly focus on how to market which products, which markets to develop, howto penetrate the territory of competitors,how to allocate different resources, andhow to organize. It focuses on strategic issues such as how to increase productivityand how to reduce costs. Who to work with, whether to computerize, how muchcomputerization needs to be implemented, and how to train the workforce accordinglytechnological challenges likely to be faced. Management information systems used in the education environment under theministry of education are the use of basic data of education or more commonlyknown as DAPODIK.

According to Permendikbud No. 79 of 2015 on Basic Data of Education is a data collectionsystem managed by education and culture that contains data on educational units, learners, educators and educationalpersonnel and educational substancewhose data is sourced from educational units that continue to be updated online. DAPODIK aims to realize a single databaseso that it can create integrated educationdata governance and produce re presentative data to meet the needs ofministries and other stakeholders.

With this DAPODIK has the aim of supporting the improvement of efficiency, effectiveness and synergy of basic data collection activities integrated in a data collection system for use by the ministry and all stakeholders.

Dapodik is a system for collecting, storing and managing educational data.

The DAPODIK application system is continuously undergoing changes, based on the history of Dapodik services began to be developed in 2006 by the Bureau of Planning and Foreign Cooperation known as the Bureau of PKLN Depdiknas at that time. The following is conveyed the track record of DAPODIK travel from the period 2006 to 2011. Dapodik has functions:

- Provide allocation of school operational assistance funds in accordance with the number of students in a related institution or school.
- Provides the allocation of allowances for teachers who are already said to have met all the requirements set.
- Allocation of quota of beneficiaries - allowances for teachers who have met all the conditions set
- Allocation of facilities and infrastructure assistance for schools where facilities are still inadequate
- Submissions and efforts to improve school institutional data
- Submission and VerVal (Verification and Validation) data and Unique Number of Educators and Education Personnel or NUPTK
- Submission program and VerVal data for learners (students) as well as (NISN) national student parent number
    - Submission as well as efforts Verval data related to the education unit and (NPSN) National School Principal Number
    - Teacher mapping and equalization programs
    - Monitoring and evaluation of various policies and programs that have been established by the Ministry of Education
    - Accelerate and assist in efforts to increase the effectiveness of reporting that has been done from school to the ministry and reduce the risk of deviation or risk of violations for what has been previously available.

With the management information system in the field of education, DAPODIK becomes one of the foundations in the decision making of leaders both at the micro and macro levels.

e. Decision making

Decision making is a process of making a choice from a number of alternatives to achieve a desired result (Eisenfuhr, 2011).

According to George R. Terry, it is understood that decision-making is the selection of behavioral alternatives from two or more alternatives. Meanwhile, Siagian argues that decision-making is an approach to the nature of a problem, the collection of facts and data, the careful determination of the alternatives faced, and the taking of actions that according to calculations are the most appropriate actions.

According to Terry (2001) there are three types of decision making, namely:

a) Programmed decisions are structured decisions, which are repetitive and routine decisions so that they can be programmed.

b) Semiprogrammed decisions are partially programmable, some repetitive and routine, but some that are unstructured, which are complex and require detailed calculations and analysis. This satisfaction is done at the middle level management.
c) Unprogrammed decisions are unstructured, i.e. decisions that are not repetitive and do not always occur. This decision is made at the top level management.

Decision-making has two functions: the beginning of all conscious and purposeful human activities, both individually and in groups, both institutionally and organizationally and something futuristicmeans to be stuck with the future.

The purpose of decision-making is singular and occurs when there is a problem. Shamsil (1995) argues that the elements in decision- making that must be considered are: (a) the purpose of decision making, which is to know in advance the goals to be achieved from the decision-making, (b) identify the alternativedecisions to solve the problem chosen to achieve that goal. Therefore, it is necessary tomake a list of the types of actions that allow elections to be held, (c) calculations regardingfactors that cannot be known before or beyond human range (uncontrollable events), (d) the means or tools used to evaluate ormeasure the results of a decision making.

According to Siagian (2002). Steps in decision making:

- Identifying goals
- Formulating problems
- Identify possible problem-solving alternatives with a wide variety of options
- Implement and monitor decisions Factors that influence decision making

a. Position or position

In the framework of decision making, positionor position can be seen in terms of: position location, as decision maker, decision maker, or staff improve position, as strategy, policy, regulation, organizational, or technical.

b. Problem

A problem or problem is a barrier to the achievement of a goal, which is a deviation from the expected, planned, desired or must be solved.

c. The situation

Situations are all factors in each other's state of interest, and that together have an influence on us and what we want to do.

d. Conditions

Conditions are the whole factors that together determine our power of movement, do orability. Most of these factors are resources.

A school principal has faced some troubles during their decision-making process. First, the decision-making process of the school principal has been influenced by unreliable factors. Psychological factors such as perception, roles, attitude, personality, motivation and job satisfaction (Astuti, 2018), for example, have affected on the decision-making process. The other factors are individual worth, personality and risk-taking tendency (Ayub, Wahyudi, & Syukri, 2014), gender, experience, and competency (Kasprzhak & Bysik, 2015). Those implausible factors can be ignored if the school principal has an access to the accurate data system. Second, the school principal has found technical problems in the decision-making and planning processes. Third, there is a leadership line boundary. The school principal has not gained full autonomy in decision-making process. Structurally, the school principal has to follow the upper-line leaders' decisions. For instance, the school principal has slowly run the decisionmaking process on the school infrastructure management due to the complicated and lengthy bureaucracy and regulation (Ayub et al., 2014). Hence, the difficulties faced by the school principals above are generally because of the lack of data and up-to-date information availability on planning parameters

The goals to be achieved, both individual goals, unit goals (units), organizational goals, and business goals in general have been specific or determined. The objectives that have been determined in decision making are intermediate or objective objective objectives.

Jahangir (2005) states that based on the significant role of information is critical in the decision making to be made, organizationsmust ensure that they have a good management information system.

As a major consideration, Management Information Systems are very complex and delicate, which requires rigor in the decision making that must be taken by managers. This is the reason that an organization can ensure that it has chosen the right individuals to control the information system. A cautious and professional person is, one who can guarantee positive prospects in driver's license with regard to decision making and other related in the field of business (Lingham,2006).

RESEARCH METHODOLOGY

This research was conducted using qualitative research methods. The type of research used is field research that seeks to describe a symptom, event, event that occurs at the present moment. The implementation of this study demands the presence of researchers atthe research site, because researchers as the main instrument. This research was conducted in several vocational high schools in the Cianjur area of Indonesia. This research was selected in Cianjur Regency because Cianjur Regency has 186 vocational highschools.

The questions of this research is how to used system management systems information for decision making in vocational high schools?

The participant of this research is some vocational high schools in Cianjur, there are SMK Bina Bangsa Pertiwi, SMK Solusi Bangun Indonesia, SMK Al-Manar and SMK Al-Ikhwan. This research using interview to headmaster, operator.

In this study, researchers used data collection techniques by interview and observation to find out the steps of using information management systems in decision making at the education unit level. Interview activities were conducted with several principalslocated in urban and rural areas.

The first researcher have interview with the headmaster, operator and some teachers in schools. The questions about how to use management information systems for decision making in vocational schools. The questions are :

1. When the headmaster use data for decision making?
2. Why the data invalid when use in decision making?
3. Where the pricinpal get the data?

RESULT

Majority of the managers involved in the study found the software they used in the school management practical. However, very few of them thought that they used all functions of these softwares. This may result from the fact that managers have insufficient education about the managerial software. The Ministry of National Education attaches more importance to teacher training in technology training during the studies of in-service training. Training of the managers is a serious problem even in the other countries which practice the applications of managerial information systems in their schools. For example, in his study involving schools of 26 countries, Pelgrum (2001) showed that having insufficient education is among the most important hurdles of managerial information system applications according to the school managers. Likewise, Jetton (1997) in his study involving school managers from Texas, Allen (2003) in his study involving managers from Ohio, Dowson (2001) in his study involving managers from Louisiana, Goeltz (1998) in his study involving managers from Idaho, Borruso (2000) in his study involving managers from New York showed that, according to the managers, inefficiency in the use of technology resulted from the insufficient education they received.

Stages of DAPODIK management in decision making.

One of the information that is often used in the education unit environment and used as abasis in decision making is the main data of education or often called DAPODIK. Here the management information system processes data into an information with several stages, namely:

1. Collection

Data is collected from sources including learners, educators and education personnel, institutions and others.

2. Classification

The data that has been received is classified based on required categories such as gender, rombel and zone of residence.

3. Interpretation

Data that has been reclassified in intrepetting or in other words is given meaning.

4. Storage

Data that has been interpreted will be stored in the DAPODIK management information system and can be stored manually by printing.

5. Data Calling

Data calling or retrieval is done when the principal needs the information contained in the data.

The role of management information systems in decision making

From the results of the interview conducted itwas obtained that in the field of each task carried out by each

coordinator cannot be separated from the role of educational management information. Management information systems are available at theschool in the form of dapodik applications, school websites, teacher blogs, computers, spreadsheets and data storage applications. As the principal also uses the role of the education management information system in determining the numbers to be taken in thefuture.
Data obtained from the DAPODIK management information system in the field of learners can be a basis for decision making about learners, including about school financing policy, health. students and so on. As for the field of facilities and infrastructure institutions inputted data on buildings and spaces and what infrastructure is owned by the school unit so that school leaders can takeWhat are the means needed and need to be built to achieve the educational goals that have been determined.

CONCLUSION

Management information systems that are used in general at the vocational high school level are the main data of education (DAPODIK). In decision making a principal can use DAPODIK as a foundation and consideration material. Some of the dapodik management steps are Collection data, Classification, Interpretation, Storage and Calling of Data.

REFERENCES

[1] Aldarbesti. Management Information System for Education. IOSR Journal of Research & Method in Education (IOSR-JRME) e-ISSN: 2320–7388,p-ISSN: 2320–737X Volume 4,

[2] Allen, J.G. (2003). A study of the professional development needs of Ohio principals in the area of educational technology. Doctorate Thesis. Cincinnati: University of Cincinnati

[3] Amirin. Tatang M., Pokok-pokok Teori Sistem, Jakarta: Rajawali Pers, 2011.

[4] Astuti, W. S. (2018). Hubungan kepemimpinan kepala sekolah dengan kinerja guru di SMK swasta bisnis manajemen Kecamatan Padang Barat Kota Padang. [The relationship between principal leadership and teacher performance in private business management vocational schools, West Padang District, Padang City]. Jurnal Bahana Manajemen Pendidikan, 7(2), 16–23. https://doi.org/10.24036/bmp.v7i2.5989.

[5] Ayub, U. M., Wahyudi, & Syukri, M. (2014). Profil kepemimpinan kepala sekolah dalam pengambilan keputusan pada pelaksanaan manajemen berbasis sekolah. [The profile of the principal's leadership in making decisions on the implementation of schoolbased management]. Jurnal Pendidikan dan Pembelajaran Khatulistiwa, 3(7), 1–16. https://jurnal.untan.ac.id/index.php/jpdpb/article/view/6395.

[6] Brightm Amankwah, A amd Asare Gideon " The Impact Of Management Information System On University Of Education Winneba, Kumasi Campus Ghana"

[7] Christopher, J. C. (2003). Extent of decision support information technology use by principals in Virginia public schools. Doctoral Thesis. Virginia: Virginia Commonwealth University.

[8] Jahangir. 2005. Socio-economics Condition of Haor Fishermen. A Field Level Study. BRAC University Journal, Vol II No.1 P 57-63

[9] Jetton, R. C. (1997). The impact of the principal's attitudes toward the implementation of computer related technology and restructuring as perceived by Texas high school principals in the Region IV Service Center area. Doctorate Thesis. Texas A&M University

[10] Kasprzhak, A. G. & Bysik, N. V. (2015). Decision-making styles of Russian school principals. Russian Education & Society, 57(7), 590–613. https://doi.org/10.1080/10609393.2015.1096148.

[11] Pelgrum, W.J. (2001). Obstacles to the integration of ICT in education: results from a worldwide educational assessment. Computers & Education 37, 163–178.

[12] Permendikbud no 79 tahun 2015 tentang DATA POKOK PENDIDIKAN from Abstrak Permendikbud Nomor 79 Tahun 2015.pdf (kemdikbud.go.id)

[13] Rochaety, Eti, dkk. 2008. Sistem Informasi Manajemen Pendidikan. Jakarta :Bumi Aksara

[14] Robbins, S. P. (2003). Organizational behavior. New Jersey, NJ: Prentice Hall.

[15] Rusdiana, H.A dan Moch Irfan. 2014. Sistem

Informasi Manajemen. Bandung: Pustaka Setia.
[16] Shah, Madiha. Impact of management information systems (MIS) on school administration : What the literature says.